





AN

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FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

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FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word TO BUILD is the Anglo-Saxon Bylisan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is GOODNESS."

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ARTICLES AND REVIEWS

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English Architecture: 1884.

DURING the past few days many of us having been wishing each other, individually, "A happy New-Year," a wish which we beg hereby to offer collectively to our readers, subscribers, and coadjutors at home and abroad, to all who are interested in the various subjects, practical and artistic, of which it is our duty as well as our pleasure to treat. More especially are our good wishes offered to the members of the profession of architecture, in whose welfare we are bound to feel

interested, and from whom we hope for the continuance of a reciprocal feeling of interest and goodwill. And while expressing this feeling in regard to the profession at large, as those for whom, in the common phrase of a bidding prayer on the "Founders' Day" of some institutions, "more especially are we bound to pray," we may naturally extend our view further, looking past the architects to architecture herself, the noble artistic hand-maiden of civilised life, and consider what are her prospects and conditions at present, and with what reasonable hopes we may wish to English architecture, also, a happy new-year, and many succeeding and prosperous anniversaries.

The most favourable point in regard to the architectural work which is rising up around us at the moment, may be said to be this, that it leaves room for a very free choice in regard

to the direction in which it may be further worked out. The satisfaction to be derived from this consideration relates, however, rather to the future than to the present. An impartial critical review of current English architecture (if we may use the expression) shows a state of the art of architectural design in which those qualities of logical and harmonious treatment of every portion of a design in reference to a leading idea, the observance of which constitutes style, are almost entirely abrogated, and the object of architects seems to be to throw together, pell-mell, details from various styles, so as to leave it difficult to assign any definition to the result, unless we accept as such the title rather hastily suggested the other day by a well-known member of the profession,—the "They-all-do-it" style. Now, we are by no means complaining of the fact, *per se*, that it should be difficult any longer to describe a building simply as "Gothic" or "Classic"; on the contrary, we have always upheld that modern architecture should be, and might be, something more than a mere repetition, however ably carried out, of this or that style of the past. As long as that system of mere repetition was kept up, of course it was necessary that architectural criticism should accept the fact to a certain extent. Granting the conditions, there might be good modern Gothic and bad modern Gothic; and there might here and there be examples of works in which, though not a detail could be found which was not in the books, there was distinct originality in general design and combination. So in regard to the *pot-pourri* fashion (for we have declined to call it "style") of the present moment; there is *pot-pourri* which is merely weak and shuffling, and there is *pot-pourri*, such as Mr. Norman Shaw's at the foot of St. James's-street, which is really picturesque and fascinating in general treatment, and only makes us regret that some

of the details are so little worthy of the main character of the building. But the kind of originality which is aimed at by this composite manner is a false, not a true, originality. There is no formative spirit in it. It is simply a throwing together of incongruous details in a thoughtless and illogical manner quite at variance with anything which is in the true interest of the word "design." And the worst of it is that, in order to render the union possible at all, the baser and weaker forms of past architecture have to be selected. Pure Gothic detail will not assimilate with pure Classic detail, by any ingenuity of derangement. But details of very poor and debased Classic type, out of which the true artistic spirit of Classicism has departed, may be mixed up with details of poor and debased Gothic, in which the true Gothic spirit of design has been weakened and emasculated. By getting rid, in short, of the best and strongest elements of both styles, and selecting only the weaker and more debased, you may manage to mix the two in a passable sort of manner; for, as all the details together are bad, there is at least that sort of unity between them, whatever that may be worth.

This is what a great deal of recent architecture in England, and in London especially, consists of; and however its deficiencies may be carried off by excellent workmanship, of which there has been a great deal, especially the introduction of very superior brickwork (which we admit to be a very suitable material for London street architecture), it is a mere fashion, requiring little or no thought to carry it out, and in reality appealing, like the Gothic revival, to a sentiment or association in relation to a past period, not to any intrinsic principle of architectural design. Let it be granted that the brick house, in the prevalent manner, is a welcome enough change from stucco,—that is but a negative

praise. The positive result is that, with all the money expended on these brick buildings, which represent a by no means economical form of architecture, we are not only losing the sense of style, but of architectural dignity also. This is lamentably apparent, in some cases, where the Queen Anne fashion has developed itself in the form of churches and other large buildings, in which its deficiency in breadth and dignity is felt far more than in the case of private houses. But even in these latter, piquancy of detail and little picturesque oddities of construction, which give a quality of "unexpectedness" to a building, and which are found in the best examples, do not, to our thinking, atone for the lack of that architectural dignity which should belong even to a street house of the first class. We may illustrate the point by reference to the two views of modern Berlin street architecture which are engraved in the present number. We do not say that they represent a style of architecture with which we are entirely in sympathy. They verge a little too much on the sort of architecture which is commonly spoken of as "handsome." But they do represent a dignity and largeness of manner which appears to us to be a better type of what the leading street houses of a great capital should be, than the buildings with nondescript assortment of detail, and piquant fancies of different kinds, which we see put up in our own streets. Modern civilised life is more truly represented by dignity and finish than by piquancy of architectural exteriors; and certainly architecture is better represented by buildings which show logical unity of method and treatment, even if not of the highest type, than by a *pot-pourri* of incongruous details swept together from the leavings of decayed styles, with no unity of method to combine them.

The most satisfactory consideration in reference to English architecture, as we observed, is that it seems really to be just now in a somewhat untrammelled condition, not committed to anything in particular, and that there is room and suggestion for the endeavour to work out some new forms in a better and more considerate manner than is being generally attempted at present. One thing is, however, quite certain: that nothing of this kind can be done without thought, and without bestowing more consideration on the working out of design, and less on mere draughtsmanship, than is done at present. Instead of throwing together details borrowed from various sources, let our architectural designers endeavour to refine upon these elements of detail, using them as suggestions to be worked into better shape, and to be harmonised into a logical and congruous style; and then something may be evolved out of the present mixture of heterogeneous elements which has been too hastily accepted as representing the architectural tastes and inclinations of the day.

It has often been suggested of late years that if anything like novelty and originality of style can be achieved, it is most likely to be done by the fusion of Gothic and Classic elements. Something definite in this direction seems to be represented in Mr. Waterhouse's building for the Technical College of London, of which we publish an illustration. This, like the more fashionable manner of the day, can hardly be called either Gothic or Classic; but the union of the two elements is carried out in a very different manner from that adopted by the Queen-Annists. The symmetrical balance of the design recalls Classic precedent. Some of the details verge more on Classic than Gothic form; but the building exhibits a certain force and effectiveness in the mouldings and other details which is so far Gothic in feeling and effect, that it is suited to our climate, which the types of Classic moulding and detail are not, except under unusually favourable circumstances of weather and atmosphere. The architecture is simple and unelaborate, but that is in accordance with the objects and nature of the building; its architectural character is that of practical common-sense; and herein we may point to it as a very favourable example of English architecture of the day, which, without pretending to great artistic

effect, is simple, broad, and unpretending in style, and free from any suspicion of oddity or tricks of effect. This, of course, is not all that we can demand from architecture on a large scale; but there is a time to be rich and decorative in architecture, and a time to refrain from too much adornment or display; and the Technical Schools building, considering its object and uses, hits the mean very happily, and is an example of the architectural common-sense and propriety which we should wish to see characterising modern English architecture in its every-day aspect.

Having passed beyond the architects to speak of architecture generally, we may for a moment revert to the professional side of the subject, and consider whether there is anything for special observation in relation to the present position of the profession. We fear this cannot be regarded as satisfactory altogether; but at the same time the causes for dissatisfaction are in some sense more apparent than real. It is impossible to blink the fact, that the architectural profession is not much in favour at present, so far as we may regard the public press as the organ of public opinion. How far does this journalistic criticism represent educated public opinion? And so far as it does, how far is that opinion justified? As to the first part of the question, our belief is that there is hardly such a thing at all in England as educated public opinion about architecture. It is a subject about which the public in general, to invert an ordinary form of expression, care little and know less. Consequently, they are very much dragged in the wake of newspaper opinions, which in a general way are probably, on this class of subjects, of even less value. It may be doubted whether there is any European country with a daily press so ill-informed as ours about most matters connected with architectural art and architectural practice, and so ready, in spite of that want of information, to pronounce sweeping criticisms, sometimes ignorant, sometimes spiteful; often both. The sort of irregular guerrilla warfare carried on against architects in the press at present appears, however, to be only one development of a common weakness of English social character. From time to time there comes over English society a desire to have something or somebody to abuse. This spirit holds "movable feasts," and at present it has fastened, like a sort of vampire, on the architect. When a leader-writer is short of a subject, he abuses architects. It has become a fashion to do so, and he is sure of a certain amount of answering sympathy from readers who know even less about the subject, if that be possible, than himself. Apart from that, there are in some quarters special personal influences at work, the existence of which is perfectly well known, and which ought to render architects, if they consulted their own dignity, much more indifferent to the kind of libel frequently directed against them than they sometimes appear to be. To answer such attacks appears to us to be not only derogatory, but inexpedient, as an interference with a form of amusement which cannot in the long run discredit any but the persons who indulge in it, and the editors who are careless or ill-informed enough to countenance it. Referring to one special case of recent occurrence, we doubt very much whether the official representative body of the profession acted wisely in replying formally by letter to an attack of this kind. To our thinking they paid the "society" journal which inserted the libel far too high a compliment in noticing it. No person of sense would ever have believed such statements upon such authority.

If we come from the moral to the architectural side of the subject we cannot but feel that in so far as the architectural profession falls short of what it should accomplish, the responsibility for this must, to some extent, be shared by the public, who are its employers. The English public do not know what they want in architecture, and they will never be satisfied till they get it. A few years ago they all wanted Gothic buildings, and put themselves into the hands of clerics, and if the Gothic detail was right they never cared for anything else; indeed, a church architect who

had talked about warming and ventilation would have been scouted, as probably unsound. Now, under the influence of a sort of sanitary mania, the public all want patent drainage and ventilation, and profess to despise everything else, and lose sight even of the idea that architecture is an art. Our opinion has always been that the English architectural profession has leaned, during the last generation, too exclusively towards the artistic and what may be called the sentiment side of their profession, though there have always been brilliant and notable exceptions to this. There is a great improvement in regard to this now, far more than the public and their self-constituted instructors are aware of; the danger seems to us to be now that the artistic side of the profession should be forgotten, and that architects, who, like other persons, "must please to live," should be required to become mere planners, draughtsmen, and ventilators. We see indications of this sort of spirit in the denunciations which are made every now and then in the House of Commons against any expenditure on architectural effect or architectural style; a feeling which is absolutely contrary to that which has always pervaded great states in great periods of their history. If we have forgotten to care for architectural beauty in our streets, we have dropped, at all events, one of the tastes which has always hitherto been a concomitant of the highest civilisation and of true national greatness. *Adieu amen!*

THE THAMES COMMUNICATION QUESTION.

AMONG the Bills deposited in accordance with Standing Orders, and of which we gave some particulars in a recent number (vol. xlv., p. 874), which are now undergoing, or speedily to undergo, official dissection, few are likely to arouse more attention, or to arouse greater opposition of opinion in the ensuing session, than those connected with the question of further communication across the Thames. It is not to the credit of our methods of carrying out public works that there should be so wide a difference of opinion as still exists on the subject. For wide difference of opinion on such a practical subject implies the prevalence of ignorance. The points necessary to bring forward in order to let such a question settle itself, and appear in its own form to the public, whether as a magnificent and beneficent architectural scheme, a wise compromise between opposing interests, a well-meant blunder, or a palpable job, are easy to find. It is not for a moment to be supposed that it is impossible, or even very difficult, to arrive at a conclusion as between these different views. How such a conclusion would be arrived at in almost any other European country, we will presently remind our readers; but let us first inquire how these projects are treated among ourselves. There are various bodies that have interest in, or control over, the Thames and its navigation. To the Thames London owes its birth, its wealth, and its character as, to some extent, the commercial metropolis of the world. Thus the Corporation of London has, and always has had, a voice as to any proposed interference with the river, as far as a free sea passage downwards from directly below London Bridge, is concerned. Then the Conservators of the Thames are an important body, constituted by Act of Parliament, exerting defined powers, and under whose recent management a marked and steady improvement in the tidal flow and navigable character of the river has taken place, and is still in progress. The Metropolitan Board of Works, however they may have extended their action beyond the limits originally contemplated, have also had much to do with the Thames. They have provided London with a noble system of river walling over a portion of the banks of the river; and they have successfully undertaken the task of freeing, and to some extent rebuilding, the bridges within their district. Each of these bodies has its rights, its powers, its duties, and also, unfortunately, its views. The divergence of these views is such as to prove that at least two out

of the three bodies have not arrived at a full appreciation of the elements of the problem which they propose to solve.

Of the controlling features of the case one or two only can be mentioned as universally acknowledged. That there is a contrariety between certain requirements is one of these. The need (if such there be) of the littoral districts east of London Bridge to have a direct means of communication with one another, is a need which clashes with the more ancient and important need of maintaining the river channel, not only as practically navigable, but as protected against any avoidable impediment, from the Nore to the Upper Pool. Thus while, in order to facilitate or to create a land traffic from the northern to the southern bank of the Thames, the erection of a series of low-level bridges of uninterrupted roadway would unquestionably be the readiest method, the adoption of such an expedient would have the effect of moving down the Port of London to the seaward of the easternmost of such bridges. Therefore by common, if not by universal, assent, that method of crossing the Thames is out of the question. Then come the compromises; of either one or more lofty bridges, spanning the river at such a height as to allow of the uninterrupted passage of the craft, at all times of tide; of subterranean passage; and of a low-level bridge with one or more arched ways or channels made so as to open and to close, for the alternate accommodation of both river and roadway traffic. Of these methods, the two first are advocated by the Metropolitan Board of Works and their Engineer, the third by the City Architect. The advantages or disadvantages of each are as follows. A high-level bridge, which, in addition to being a magnificent architectural feature, would be unobjectionable (or nearly so) as regarded navigation, must have the surface of its roadway something like 130 ft. above the low-water level of the Thames. It is exceedingly questionable whether any traffic of an amount sufficient to justify, or, indeed, to excuse, the outlay requisite, would climb to this height, in order to use the bridge. For a tunnel, on the other hand, a descent of about half the height, or to some 70 ft. below low-water level, might be enough, but that would partly depend on the state of the bed of the river at the point selected for crossing. And then it has to be remembered that the general level of the streets is above, not only low-water, but high-water, level; so that the choice may, perhaps, be reduced to that between an ascent or a descent of 100 ft. in either case. It has to be shown whether any traffic would be created by such a facility; and it must be admitted that the experience of Southwark Bridge is adverse to that hypothesis.

With regard to the low-level bridge with openings, it would be of the nature of a compromise between the interruption of land and of water traffic. There can be no doubt that it would seriously interfere with the free navigation of the Thames, the passage up and down which would be reduced to a fourth or a fifth of its present width, and would be rendered intermittent instead of uninterrupted; and the land traffic would also be intermittent. Whether the moveable spaces were made to open at stated intervals, or on the arrival of a vessel at the bridge, would, perhaps, throw the balance of inconvenience on either the land or the water traffic; but, roughly speaking, each would suffer a material check. When the expense of a bridge is considered it will, probably, be found that while a low-level bridge would cost somewhat less in structure, and very much less in approaches, than a high-level bridge, it would run far more risk of great cost in foundations, which incur that portion of the cost which it is most difficult accurately to forecast. And when we remember the interference that the piers alone, even if each span were made to open, would cause to both flow and trade of the river, and when the problematical character of the land traffic is borne in mind, it hardly seems as if the opening low-level bridge can have any great advantage over either of the expedients before discussed. The high-level bridge or the tunnel might

prove to involve heavy outlay for no adequate result; the low-level swing bridge, at, perhaps, not a very much lower cost, would cause some impediment to navigation, while its services to land traffic would be more than problematical. A bridge which you may at any moment find stopped, just when you want it, is no bridge at all.

Do we argue, then, it may be asked, that nothing is to be done, and that no communication is possible across the river without causing more mischief than advantage? By no means. What we do say is, that it is not just to London that a question of this kind should be allowed to remain as a matter of opinion, or that a snap victory should be caught by the advocates of one, or the other, or neither project. How would such a matter be dealt with in Italy, the home of modern architecture,—hydraulic as well as palatial? How, in those low-lying countries which know, far better than we do ourselves, the value of water-ways to the sea? In every Continental state with which we are acquainted the procedure would be the same. Plans, indeed, might be invited, but not plans from the engineers of public authorities, prepared to do all within their power for the adoption of their own plans, rather than for the true scientific solution of the physical and social problem involved. An architect or engineer, or, perhaps, a commission of three engineers (in the case of an engineering work), would be nominated by the minister of public works to study the case, and to submit an exhaustive report. Furnished with such a report, the department of public works is on *terra firma*. Then, perhaps, it will offer to receive suggestions, or even to decide on supporting the proposals of any enterprising individual or society to carry out certain work on certain terms. For the vague and capricious control of whoever might happen to be at the head of the department of public works, is thus substituted a competent knowledge of all the elements of the problem to be solved, as well as of the modes proposed for the solution, and of their effect.

We are not now concerned to recommend the exact way in which this plan should be applied in England. Our usual modes of arriving at such an independent judgment are either Royal Commissions or Parliamentary Committees. Different parties, armed at all points as best they can be armed, contend before either Commission or Committee. The skill of practised barristers is retained by the advocates of one scheme, to confound the witnesses of their opponents. In the case of a committee, the advocates are found among the judges; that is to say, the fullest plays given, without reproach, to the individual interests or proclivities of members of the Committee. It is not truth for which all strive, but victory for which each strives. Probably in this particular case, if a joint committee were appointed, consisting of one member for the Corporation of London, one for the Conservators of the Thames, one for the Metropolitan Board, and perhaps one for the Trinity House, or some representative of the shipping interest, and one for the Board of Trade; and if such a committee had before them such a report as we suggest, daylight would be thrown on a very obscure question.

An element of the report must be the nature of the demand for a crossing. The need has as yet been taken for granted, and some witnesses of weight have denied its existence. It does not appear to us to be absolutely proved by the condition of existing traffic; but we cannot quite accept the view that a new line of communication is not to be made until the demand for it in the present is absolutely proved by facts, if there is reasonable cause to think that it will prove a boon in the future. That more direct communication between the two divisions of London eastward of London Bridge would be a benefit to the inhabitants of both banks there may be little or no doubt. The question is, "Do we want more bridges?" In relation to this it appears to us that most inadequate attention has been given to the alternative of constructing a large and commodious steam ferry service, or more than one, east of London Bridge. To those who know

what an immense daily traffic is regularly and conveniently carried on between Liverpool and Birkenhead by the continuous succession of large ferry-boats, it must seem extraordinary that the feasibility of meeting the difficulty in the same way on the Thames should be so little thought of. The fact that a tunnel is now being made under the Mersey does not affect the question; that is for railway purposes only. The Thames is not nearly so wide as the Mersey at the respective points where communication is required, nor so much exposed to the effects of storms, nor is its tidal flow as rapid as that of the Mersey at spring tides. Passengers and goods can be conveyed between Liverpool and Birkenhead every ten minutes during the greater part of the twenty-four hours. Why cannot the same thing be done on the Thames? Why talk of a high-level bridge to which a steep ascent must be made, or a low-level one which will partially block both river and land traffic, and be practically valueless as a bridge, when for one-tenth the cost (or even less) a service of specially constructed ferry-boats could be started to ply every five or ten minutes,—a plan which for land traffic would be almost as good and as constant a communication as a bridge, and would impose no hindrance on the river traffic? We doubt if there is any better reason against it than that it has never been properly tried, and that there is a kind of local conservatism in the mind of the typical Londoner which inclines him to think that nothing which has not a London precedent can be right. We have always gone across the Thames on bridges, and it is the accepted way; we have never had a first-class ferry-service across, and so it is not to be thought of. We can only say that at least a year's trial ought to be given to a first-class ferry,—with boats very different, but it is understood, from the regulation Thames steamboat; boats of large deck-space and special construction; and if this experiment is not adequately made, before the construction of fixed crossings, every form of which has been shown to be open to grave objection, the neglect of it will imply, to our mind, a want of the most ordinary common-sense, on the part of those who may be ultimately responsible for the manner of dealing with the problem.

"SIR JOSHUA" AT THE GROSVENOR GALLERY.

THE Directors of the Grosvenor Gallery (for under this official style Mr. Comyns Carr and Mr. C. E. Hallé seem now to share with Sir Coutts Lindsay some of the responsibility and credit attaching to the Exhibition) have earned a new title to public gratitude for having brought together so large a representative collection of the works of the greatest of English portrait-painters, for such Reynolds must be admitted to be. Some readers will perhaps be surprised that we should even hint that there could be a question in the matter. There are, however, qualities to be found in the finest examples of Gainsborough, if we compare individual works of either artist, which might leave it doubtful whether Richard Wilson's brusquely expressed opinion, given, certainly, under some provocation, was not to be justified. There are special Gainsboroughs exhibiting a power and vivacity of characterisation which is not often equalled, certainly never surpassed, by Reynolds. Gainsborough, too, painted animals better; the dogs which accompany so many of his figures are often superior to any animals of Reynolds's, and Gainsborough certainly could hardly have been guilty of such a beast as the wooden tiger in Reynolds's "Circe" portrait, painted, as the annotator of the catalogue (Mr. Stephens) observes, "evidently from a stuffed skin." But when we compare Reynolds with Gainsborough *en masse*, he vindicates his claim to the superior position generally accorded to him, by his variety in the treatment of his subject, by a dignity which never forsakes him, and which in some of his finest works rises almost to a monumental grandeur of character, and by his

splendid and refined feeling in colour, in cases where the hands of time and the cleaner have spared us this quality in anything like its original beauty. There is a pleasure other than artistic, too, in looking through the collection; a pleasure, historical or biographical, in contemplating so many likenesses of persons well known in our social or political annals; a pleasure social in the feeling of being thrown in the company of so many charming women and children, and occasionally eminent men, once the lights of the English society of their day; the women and children predominating, however, and almost all marked by a superiority of manner and appearance which makes us feel that we are in good company with them, not less than with their accomplished portrayer, about whom Johnson left on record that beautiful and evidently sincere compliment, that Reynolds was "the most invulnerable man" he had ever known, for he was the one whom you would find it most difficult to say anything against if you wished to attack him; a sentence we were pleased to find quoted in the catalogue notes.

Some talk had been heard, when the project of the exhibition was the subject of talk, as to arranging the works chronologically. The attempt has not been made, probably because the consideration of effective arrangement of the paintings predominated. We very much regret this, for though the general appearance of the room would not have been so symmetrical and balanced, the educational advantage of a chronological arrangement which the eye can apprehend at a glance is very great; and though the majority of the dates are given, many will not take the trouble to note and compare them with the style of the pictures, who might have been caught by the chronological sequences if brought palpably before their sense of sight. A comparison of the dates shows one important point unmistakably, that Reynolds in the main was progressing to the last years of his life. This is more often the case with genius of such a calm and equal temperament as his, than with genius of the more stormy and romantic type; it is the Beethovens and Turners who overlap the mark, and become obscure and uncertain in their latest productions; the Mozarts and Reynolds, who go on quietly maturing to the end of their days; a quality the more remarkable in the case of Reynolds, who lived to an advanced age and had a long artistic career. "The Hon. Miss Frances Harris" (No. 75 in the Grosvenor Collection), painted in 1789, is one of his last works, one of those child-portraits in which he was so eminently successful, and which make one think that he must have loved children much to have painted them with such sympathy and tenderness. There are few finer examples of his powers than this rich and beautiful work, in which the lovely child stands against a background of dark foliage, with a distant landscape completing the *ensemble*. This is one of the most full and rich in manipulation of all the works exhibited in the Galleries; and the framing of the portrait, as is almost always the case with Reynolds, exactly suits the character of the figure. The child is a full-blooded, dark-eyed little creature, and the landscape and the figure make a beautiful unity, each seeming the complement of the other. Reynolds showed still finer perception, rising to poetic insight, in choosing (for we cannot doubt that the choice was his own) to paint Mrs. Nesbitt as "Circe" (11), the picture before referred to. This stately calm beauty, with a lurking cruelty in her countenance, fits well with the idea of the weird, sensual enchantress of Homer. The painting reminds us again of the variety and point in Reynolds's treatment of his sitters, his perception of the attitude and the nature of the accessories suitable to each. He never seems to make a mistake in this point. An excellent instance of quite an opposite type to the "Circe," is the portrait of a young lady, rather vaguely described as "A Niece of Edmund Burke's Lawyer" (147), which is going a good way round to bring Burke's name in. This is a very opposite character to Mrs. Nesbitt, who

was suited otherwise than in appearance for the part of Circe. This looks like the portrait of one who would be described as "a good girl"; nice-looking, but with no remarkable qualities; a lady, but not a fine lady. Nothing could be more suitable and expressive than her quiet composed attitude, the hat partly shading her modest countenance, the hands, with large gardening gloves on, posed in an attitude of easy and perfectly unstudied grace. The innate gentlemanliness of Reynolds's own character is nowhere better indicated than in this portrait; none but a man of refined mind and associations could have painted it. His perception of character is shown in another direction in the portrait of "Lavinia, Countess Spencer" (118), which has been exhibited several times in London of late years; it was for some time among the collection of Spencer portraits lent to the South Kensington Museum. The peculiar suitability of the head-dress and general make-up of the figure may have been due to herself as much as to Reynolds; the countenance is one of the most lovely combinations of lady-like refinement with character and a touch of *espiglerie* that has ever been seen; one is quite grateful that such an exquisite personality should have been preserved from oblivion, for as long at least as Reynolds's pigments will last. The well-known large painting of "The Duchess of Devonshire and her Child" (81) is another example of Reynolds's versatility; the lady is playing merrily with the child, in the highest spirits, but she is "the Duchess" all the same; her mirth is dignified. "Mrs. Pelham feeding Chickens" (9) has a piquancy of another kind. This, by the way, was not only at the Manchester Art Exhibition in 1857, as mentioned in the catalogue, but at one of the Burlington House exhibitions since then, about ten years or more back. It has been cleaned almost out of recognition, as far as colour is concerned, in the meantime. Then there is Mr. Abington (7), to go lower in the scale, as "Miss Prue" in Congreve's brilliant and unfortunately now unrepresentable comedy, leaning on the back of her chair, and biting her nails; and in the opposite direction of stage effect we have the large portrait of the beautiful Miss Gunning, or, rather, the Duchess of Hamilton (26), in flowing drapery, which is stagy without being so intended,—a rare defect with Reynolds.

It has sometimes been regretted that Reynolds did not devote more of his powers to the ideal side of his art, instead of spending his life almost exclusively on portraiture. It may be doubted whether he would have taken so high a place as he does had his aims been more ambitious, in spite of his declaration at the close of his life as to what he would have done had he had his career to run over again, and how it would have been his aim to follow in the steps of Michelangelo. He probably mistook his own *métier* in this idea; and to many there will seem to be something almost whimsical in the mere idea of the coupling of the names of Reynolds and Buonarroti. But there are examples among his works which show a spirit that reminds us to some extent of that of the great Italian whom he so much revered. Something of this spirit is seen in the well-known "Mrs. Siddons as the Tragic Muse," which occupies a central position (55) on one of the walls of the west room at the Grosvenor Gallery. But though a grand composition, there is a touch of the theatrical in it, not unsuitable to the subject, perhaps, but certainly at variance with the Michelangelo spirit, which was never theatrical in its manifestations. In connexion with this picture it is mentioned in the catalogue that it is one of the few works on which Reynolds inscribed his name, which is worked into an ornament on the border of the great actress's robe. The characteristic remark of Reynolds on the subject, which is on record, is not given; when Mrs. Siddons observed the incident, the painter replied that he was "but too happy that his name should go down to posterity on the hem of her garment." But if we were asked for an indication of something of the spirit of Michelangelo in Reynolds, we should find it rather in such a work as the portrait

of "little" Lady Gertrude Fitzpatrick" (153), the grand style of which we remember commenting upon when it appeared in one of the Burlington House loan exhibitions. This is much more than a portrait: it is a kind of apotheosis of beautiful and dignified childhood. The figure stands alone, centrally in the canvas, on the top of a rising ground, a flower growing at her feet. All littleness, all mere prettiness, is eliminated from this painting; there is a breadth and power of style in it which makes it almost monumental in character, and raises it to the level of the highest artistic feeling and inspiration. In some degree analogous, though very inferior, is the "Prince William Frederick" (53), treated in a similarly broad and abstract style. Walpole's note on it was, "Well, but too washy"; but the washiness was rather in the mind of the critic, perhaps. There is a very imposing style, too, in the "Master Lister, afterwards Lord Ribblesdale" (20), standing with a long staff held at arm's length from him, in the manner of one who would not be painted or posed as ordinary mortals. In this work Sir Joshua certainly had Vandycck in his mind; the dress, even, is called in the catalogue, and was perhaps intended as, a "Vandycck dress," though this is hardly correct; the costume has not the superbly rich and sumptuous character of the typical Vandycck costume. The influence of Vandycck is obvious again,—perhaps rather too obvious—"the first equestrian portrait of the 'First Lord Amherst' (120), who sits his broad-backed rearing charger in the manner so familiar to us in the salient figures of Vandycck's battle-scenes. The life-size portrait of the same commander (174), with his chin leaning on his hand, and, as if revolving in his mind some plan of action, is wonderfully spirited and powerful. Among highly characteristic portraits of very opposite character may be mentioned those of "Baretti" (73) and "Miss Jacobs" (79). The rather truculent Italian who enjoyed the friendship of Johnson and Burke appears, in this well-known portrait, as only too much in accordance with the sarcastic character given of him in Mrs. Thrale's lines from the verses on the Streatham portraits, appended in the catalogue. The likeness would lead one to question whether his part in the scuffle in the Haymarket, which brought him in danger of the ultimate vengeance of the law, was quite as innocent as his illustrious friends fortunately succeeded in making it appear. "Miss Jacobs" is one of the quieter and more realistic type among Reynolds's portraits of women, remarkable for its exquisitely refined grace and sentiment; a three-quarter length of a lovely and gentle young woman, seated, nearly in profile. "The Strawberry Girl," which he himself characterised as "one of the few really original things he had done," is in the Gallery (86), another example of his occasional power in imparting poetical meaning into a child portrait. It represents the same kind of aim as the "Prince Frederick William" and "Lady Gertrude," though in a less serious manner. The two latter, it may be observed, were painted within a year of each other (1780 and 1779 respectively), and seem to indicate a certain turn of his artistic feeling at the time. The "Strawberry Girl" is some years earlier.

Reynolds rose more nearly to poetic expression through such portrait works as these and the "Circe" than when he painted what might be regarded as ostensibly poetic subjects. His "Nymph" (39) is not a happy effort, and is a very milliner-looking nymph; and into "Cymon and Iphigenia" (160) he did not succeed in putting any more idealism than is in Dryden's poem, which is little enough; but as a study of the nude, for a painter who did not habitually practise that department of painting, it will always remain as a very fine example. Another instance of work out of his usual line is to be observed in the landscape, "View from Richmond Hill" (165), not one of the best interpretations of that rich bit of scenery, but very interesting as coming from Reynolds.

It is useful, in comparing the past with the present, to notice that as in the case of the Reynolds of our own day, who is leaving

or posterity such a series of splendid likenesses of the society of to-day, so, in the case of Sir Joshua, there were not wanting detractors who discovered that he could not draw, could not colour, and received far too much money for his paintings. Walpole's remark on the very fine and expressive group of the then Ladies Waldegrave (his nieces) is that "the details are slovenly, and the faces only red and white," the latter expression conveying the idea, however, that the original colour was very much fuller and stronger than as we now see it. Sir Joshua was very careless with the hands of his figures at times; possibly in some of these cases the work was not his own, though one can hardly understand a great painter leaving to an assistant a feature so difficult and so expressive of character as the hand. He painted, probably, too fast at times, and undertook too many commissions; but had he been more reticent he would have left us a less full and interesting record of the life of his day. Perhaps some similar reflection may be made when, a century or so hence, the works of John Everett Millais shall, in like manner, be collected, in some future Grosvenor Gallery, as a great portrait-painter's record of the life of our own day, its costume, and its social character.

NOTES.

WE record elsewhere the results of the meeting at the Mansion House on the 28th ult. to consider the subject of the dwellings of the poor; but we may observe here that the meeting seems to have missed taking cognizance of one of the most important points in which legislation on the subject is at present deficient. The necessity of more efficient execution of the sanitary Acts now in existence was enforced, and this and other points of importance in regard to the working of such Acts appear to have been considered in a very practical spirit; but the one especial point in which more definite legislation is required is, in regard to compelling the landlords to keep tenements in a proper state of repair, even in regard to matters which do not affect sanitation as generally considered. For all shortcomings which concern the question of public health there is now adequate legislative enactment, if properly put in operation. But there is no provision at present for compelling the landlords of the poorest class of houses to keep them in repair in regard to matters which do not affect public health or structural safety, but only the proper comfort of the inmates. Even in the case of wealthier tenants, who can bring other than legal pressure to bear, the landlord at present has it far too much his own way. But the tenant of the poorest class of dwelling has at present no legal redress for any state of dilapidation in which his habitation may be, beyond the class of deficiencies which come under the province of the sanitary inspector. He cannot even adopt the ordinary weapon of giving notice to leave; for where is he to go? Only into another tenement in as bad a state.

WE hear that Mr. F. C. Penrose has been spending some little time at Athens, visiting the scene of his former labours, which resulted in the production of what we have always regarded as the most remarkable and valuable illustrative publication that any English architect has produced. Those who are interested in Greek architecture,—that is to say, all architects of learning and culture, as well as many who are not architects,—will be much interested to hear anything further from Mr. Penrose on the subject which he has made his own, and we hope that his visit may enable him to throw still new lights on some of the questions in connexion with Greek architecture, whether on its constructive or its æsthetic side.

THE manner in which the official regulations for the preservation of theatre audiences from fire, inadequate enough in themselves, are or may be carried out, received some interesting light from a letter from Mr. Arthur W. C. Shean, Captain of the Fire Brigades Association,

in last Saturday's *Times*. This gentleman visited "a large London theatre, lately inspected by the Lord Chamberlain," and found the fire-buckets duly hung up, but empty; no provision for extinguishing fire in the flies except "an intention" on the part of one of the firemen to run up a line of hose there from one of the stage hydrants. One very fiery place is said to be "paved with good intentions," which may have stirred up a spirit of emulation in this philosophical fireman. A few lengths of hose had arrived, Captain Shean was informed, "just in time for the Lord Chamberlain's inspection." In reply to a question whether he had timed the exits, the manager replied in the negative, adding that it was no matter if the theatre were burned, as it had been passed by the Lord Chamberlain: the audience being apparently included as part of the theatre, just as the "ancestors" were part of the chapel in Mr. Gilbert's opera. Altogether, Captain Shean seems to have exhibited an inquiring turn of mind, and to have been answered with a charming confidence. We have seen no contradiction of his story.

At the Fine Art Society's room in New Bond-street are to be seen just now some very brilliant and powerful water-colours by A. N. Roussoff, a Russian artist, of no ordinary ability. The drawings are chiefly scenes in Venice, into which architecture enters largely as the framework to the figure-subjects. The drawings, in spite of great force of effect and apparently free and rather rapid execution, are remarkable as being all executed in pure water-colour, the lights, down to the smallest touch, being "left," and nothing added in body-colour.

In an interesting letter in Thursday's *Times*, Mr. George Godwin, for so many years the conductor of this journal, has recorded the history of Mr. Holloway's first ideas in regard to the dedication of a large proportion of his wealth to purposes of public benevolence. Mr. Holloway knowing (what some people at present seem to be remarkably ignorant of) that Mr. Godwin had given special time and attention to the consideration of the condition of the dwellings of the poor, introduced himself, asking for information on the subject, in order to ascertain how he could do the greatest public good without pauperising any class. A notice of the fact in this paper brought Mr. Holloway, through its then editor, about 700 letters of suggestions, out of which was evolved the idea of the Sanatorium at Virginia Water. Mr. Holloway's desire to gain the best information, and at the same time, to avoid courting any repute as a philanthropist, were equally to his credit.

It is significant of the present excitement on the subject of the dwellings of the poor, that the inhabitants of Brompton, which hardly numbers any appreciable amount of the very poor in its district, have set on foot a knight-errantry for looking after and inquiring into the means of benefiting the poor of other districts. A more noble kind of work of course could hardly be imagined, provided that the work is carried out on sound and what may be called scientific principles, which in social matters are not at variance with, but the requisite corollary of, Christian principles. Some of the investigations of the Brompton Committee in Southwark, reported in the daily journals, entirely bear out what we have said above, that where legal reform is wanted it is in the direction of compelling landlords to keep houses in decent repair, as well as in what is usually understood as a proper "sanitary" condition.

From the long letter by a Past-President of the Institute which appears in another column, it would seem that there is a strong feeling on the part of the Executive of the Institute in regard to the desirability of the profession giving a combined support to their representative body, as the only official body which effectively act in their interests. While endorsing this feeling, we may hope that the dark hints in the latter part of Mr. Which-

cord's letter, as to the possible or probable results of a certain impending architectural competition, may not be realised; if they are, it will be to the discredit of the English Government, as people will find out when they begin to understand the subject better in this country. Meantime, we may direct attention to the fact, as mentioned in another column, that the great French architect who is just dead, in a presidential speech made on a public occasion, called the attention of his brethren to the Gold Medal of the English Institute which he wore, as one of the honours he specially valued. Both our Institute of Architects and their assailants might as well bear this in mind, though for opposite reasons.

MR. HERBERT APPLETON, A.R.I.B.A., read a paper at the Civil and Mechanical Engineers' Society on Wednesday evening, on "A Sanitary View of Outcast London," in which he rather leaned to the view that much of the dilapidation of tenements is the fault of the tenants. We have before hinted that there is some truth in this, but we cannot doubt that also there is culpable neglect on the landlords' side about matters which the present law does not touch; vide a fact quoted from the pamphlet on "Outcast London" (page 634 of our last volume), and which we have since had confirmed on other evidence. In the course of the discussion on the paper more than one speaker gave it as his experience that the poorest class were unwilling to go into decent homes when built. There are many things to be unravelled before we can get "dry light" on this subject.

THE result of the placing of a "test" equestrian statue on the north-west pedestal at Blackfriars Bridge is just what we should have expected,—an absurdity. The design of the pedestal, made in the first instance by an engineer with, probably, not the slightest consideration for its relation to the effect and proportion of sculpture, would render it almost impossible to place any statue on it with good results. We have a great coarsely-designed mass of masonry with Broddingnagian Gothic details of a questionable character, of such a size that only an abnormally large or colossal statue could fit its scale, which, if put up, would dwarf everything around it. Accordingly, upon this, a smaller pedestal, of different character of mouldings, &c., has been built, and on that an equestrian statue of moderate size has been placed, which thus stands on a confusedly-designed mountainous stone erection, which in its turn completely dwarfs the statue, and makes it look ridiculous. So we do these things in England. The only way to do it is to remove a considerable portion of the original stonework, including the coarse Gothic carving, and have the pedestal remodelled on a lower level, by some one who understands his business, and will work with direct reference to the effect and proportion of the sculpture proposed. Unless this is done, another will be added to the artistic blunders of our street embellishments.

THE LATE M. LESUEUR.

ON Friday, December 28th, 1883, there was borne to his last resting-place one of the most eminent architects of our time, Jean-Baptiste Cléon Lesueur, Member of the Institute, and former President of the Société Centrale des Architectes de France, President of the "Réunion Amicale" of old pupils of the École des Beaux Arts, Honorary and Corresponding Member of the Royal Institute of British Architects, Professor at the École Nationale des Beaux Arts, former architect of the Hôtel de Ville of Paris, &c. The insignia decorating his coffin were those of an officer of the Legion of Honour and of the Department of Public Instruction of France, and the Gold Medal granted annually in the name of Queen Victoria by the Royal Institute of British Architects. The pall-bearers were six members of the Académie des Beaux Arts, MM. Eugène Guillaume, sculptor, Vicomte Henri Delaborde, Permanent Secretary of the Académie; Albert Lenoir, architect, Secretary of the École des Beaux Arts; Du Sommerard, Presi-

dent of the Association of Artists founded by Baron Taylor; Chas. Questel, architect, President of the Société Centrale des Architectes, and Antoine Bailly, architect, President of the Society of French Artists,—the two latter honorary members of the Institute of British Architects. At the cemetery four discourses were delivered,—by M. Guillaume, in the name of the Académie des Beaux Arts; by M. Lenoir, in the name of the École des Beaux Arts; by M. Questel, in the name of the Société Centrale des Architectes, and by M. Ch. Vincent, in the name of the Société d'Amis de la Chanson, of which M. Lesueur was an honorary member. From these discourses, as well as from personal recollections and from notes kindly furnished by M. Eugène Müntz, Librarian of the École des Beaux Arts, I am able to give the following summary of the career of our honoured colleague.

J. B. Lesueur, or Le Suer, was born at Claire, Fontaine, near Rambouillet (Seine-et-Oise), the 5th October, 1794, and followed, from 1811, the course of architectural instruction at the Académie des Beaux Arts, to which he was admitted as pupil of the illustrious Percier, and later of Tamin the elder, both former holders of the "Grand Prix de Rome" for architecture. It was, indeed, owing to the great influence of his first master, architect to Napoleon I., that Lesueur, who was drawn for military service among the great levies which marked the last years of the First Empire, was allowed to serve his term as attaché to the department of "Conservation des Forêts," and could thus pursue his studies without more interruption than a few light duties and the wearing of a smart uniform. He carried off the second prize in architecture in the competition of 1816, the subject of which was a "Palais de l'Institut"; in 1817, he obtained a medal at the exhibition at the Louvre, and in 1819 obtained the "premier grand prix" for a design for a cemetery or "champ de repos," sharing the honours, however, with F. Callet. The laureates went together to Rome, not without stopping, both on the way there and on their return journey some years afterwards, to study what was to be seen in the North of Italy, and thirty-five years later they published a volume on Italian architecture, under the title "Edifices publics et particuliers de Turin et de Milan, mesurés et dessinés par F. Callet et J. B. C. Lesueur, architectes, anciens pensionnaires de l'Académie de France à Rome."* In conformity with the rules of the Académie, they commemorated their stay in Rome by an "Étude de l'état actuel" (1824), and a project for the restoration of the Ulpian Basilica, comprising five sheets of drawings and some explanatory notes, for the materials of which they were considerably indebted to their English colleague and friend, Professor Donaldson. This restoration was one of the first published of that remarkable collection of restorations of ancient Roman monuments by the architect pensionnaires of the French Academy at Rome, since 1788 to our own day; a collection published, with the author's notes, under the auspices and at the expense of the French Government. It may be interesting to give the titles of the plates of this fine work:—

Pl. I. Etat actuel de la Basilique Ulpienne à Rome (Fouilles faites sur la Basilique Ulpienne par le Gouvernement français en 1812 et fouilles faites en 1824), élevation sur la largeur de la fouille, coupe sur la longueur de la fouille.

Pl. II. Plan général de la Basilique Ulpienne; coupe générale restaurée.

Pl. III. Plan restaurée de la Basilique Ulpienne.

Pl. IV. Restauration de la coupe sur la longueur.

Pl. V. Restauration de la coupe sur la largeur.

Pl. VI. Détails (au 1/2) de l'ordre de l'intérieur de la Basilique.

On his return to Paris, in 1826, he published, in conjunction with M. Alanx, jun., historical painter, a collection of lithographs under the title "Vues Choies des Monuments Antiques de Rome" (1827), and a little later (1826 to 1830), he carried out the parish church of Vincennes, a building of great simplicity, but pleasing from its harmonious proportions.

It was about this period (from 1830 to 1840) that he carried on one of the most interesting portions of his work, now too little known; for during these ten years he constructed in Paris a great number of princely mansions, some of which still exist, not entirely obliterated by the lines of the great interior boulevards of the

Madeleine and the Gymnase; and in these edifices, built on very restricted sites, where the height of the building was fixed beforehand and the imagination of the artist hindered by a thousand practical necessities of domestic arrangement and commercial profit, Lesueur accomplished marvels of good taste and artistic feeling. He gave to the French dwelling-house, which under the Revolution and under the Empire, had assumed an Egypto-Etruscan character perhaps a little sepulchral, the elegance and charm suitable to such a town as Paris; so that when, in 1878, on the proposition of MM. Jules and Paul Sedille, the Société Centrale founded an annual medal to be given to the best masters of domestic architecture, it was declared in the first report of the jury, that "avant tous autres noms seraient inscrits, en tête de la liste, des lauréats, les noms tout-à-fait hors concours de feu Duban et de J. B. Lesueur," the jury thus rendering a special homage to those two masters who were, after Percier, the founders of our contemporary French school.

In 1840 Lesueur was engaged in the extension and completion of the Hôtel de Ville of Paris. Every one will remember the remarkable beauties of that building, a true Palace of French Municipal Administration, of which there now remains to us only the recollection of those finely disposed state apartments, without a rival in Europe. What official, what minister, what sovereign even, has not envied the Prefect of the Seine the luxury of that palace, regal in the magnificence of its interior decorations? One hour of criminal folly destroyed that edifice, in which another master of his art, Victor Baltard, had erected "the Marble Staircase," the most charming *hors d'œuvre* of contemporary architecture, which had been measured, drawn, and engraved by an admiring colleague, Victor Calliat, to be reconstructed ten years afterwards by MM. Bailly and Deperthes on its former site. Lesueur, it may be noted, to the end of his life, was accustomed to inscribe himself as "Architecte de l'Ancien Hôtel de Ville de Paris," evidently conscious of this as his best support of his artistic reputation.

For the rest, his English colleagues, and, among others, the late E. M. Barry and F. P. Cockerell, as well as, among the living, Professor Donaldson and Mr. Ferguson, appreciated at its true value the talent of Lesueur; and from the moment when he was to succeed Antoine Vaudoyer* in the section of architecture, the Royal Institute of British Architects named him honorary and corresponding member, even before the French Government had created him (in 1847) Chevalier of the Legion of Honour; and in 1841, when, after having been named Divisional Inspector of the Grand Commission of Highways, Lesueur retired from practice, the same society presented him with their gold medal, an honour with which he was especially touched. In fact, in 1876, when Lesueur was called to the presidency of the Société Centrale des Architectes, he appeared decorated with that gold medal, and in the course of his speech from the chair drew attention to it in the following remarks:—

"Je veux aussi attirer votre attention sur la distinction honorifique que j'ai eu devoir porter au milieu de vous aujourd'hui; c'est la médaille royale que décerné l'Institut des Architectes Britanniques, médaille que j'ai reçue en 1851, et qui, accordée à un si petit nombre d'artistes étrangers à la Grande Bretagne, est pour moi, pour notre corporation, pour notre art français, un gage précieux de l'estime que les architectes anglais portent à leurs confrères de France. C'est à ce titre, messieurs, que votre Président m'a devoir s'honorer au milieu de vous de cette distinction rare, qu'il considère comme méritée par notre art français contemporain."

Lesueur was promoted in 1870 to be officer of the Legion of Honour. We may add to the brief enumeration of the constructions which he carried out, two which indicate the varied nature of his professional acquirements, a sugar-refinery in Portugal, and the Conservatoire de Musique at Geneva, which were built respectively in 1874 and 1877; of the planning of the latter building he was very proud. We may also mention, as a project not carried into execution, the remarkable water-colour studies for the decoration of the Place de la Concorde, which he made in 1840; and, finally, his accession to the post of "Professor of the Theory of

Architecture," at the École des Beaux Arts, to which post he was called in 1852, as successor to Abel Blouet, and which Lesueur filled till his death, regulating the conduct of the students' competitions, giving annually many lectures devoted to the study of the antique orders, taking his part in all the juries of the School as well as of the Académie, and summoned also for twenty years, and down to almost his last days, to most of the juries of the Salon and of various architectural exhibitions. Nor must we forget an important archaeological study which he made at a moment when the works at the Hôtel de Ville were suspended, of the publication "Chronologie des Rois d'Egypte," a work crowned (*couronné*) by the "Académie des Inscriptions et Belles Lettres de l'Institut de France" in 1846, and printed by authority and at the expense of the Government, at the "Imprimerie Nationale" in 1848. In the two portions of that work Lesueur studied successively the corrections as to the lists of the Pharaohs as gathered from ancient authors, which could be furnished by the study of hieroglyphics and Egyptian monuments, and finished with a "Canon Chronologique" from the time anterior to Manes to that of the conquest of Alexander.

One may imagine that, after this important work on Egyptian chronology, the writing of some "Researches in regard to the Date of the Tower of Babel" (published in the *Revue Archéologique*) was for him only a kind of rest from more serious labours. But that one of his writings to which Lesueur attached the most value, that which summed up for him the results of his long life of labour and study, was his "Histoire et Théorie de l'Architecture," a volume which appeared a little too late, in troublous times, and which, it must be confessed, did not arouse in the French architectural world the notice which such a work ought in any period to have excited; and, in spite of the matter of the curves of the Parthenon (the existence of which Lesueur persisted in denying), the work exhibited some remarkable and brilliant suggestions in regard to the ancient architectural orders.*

Although in his eighty-third year at the time this book appeared, Lesueur was still active and full of energy, and handled both pen and pencil with equal facility. He was considerably interested in the reviews of his work which reached him from England, and wrote to the writer of this notice about them as follows:—

"Mon cher Confrère, Une lettre fort singulière que je viens de recevoir de Donaldson me rappelle que vous m'avez promis de donner une traduction de l'article qu'il a fait insérer dans un journal anglais (le *Builder*, 17), et dans lequel il doit prendre part pour les courbes imaginaires de M. Penrose. Je suis bien curieux de voir cet article, et vous serais très obligé de vouloir bien me le communiquer. Je vous salue cordialement la main, LE SUEUR."

We may be permitted to cite here, by way of close to these discursive notes, a verse from one of the *chansons* which Lesueur, always ready to take part when his turn came, never failed to render to his comrades at the "Académie des Chansons" before referred to,—an institution now nearly 100 years old. His productions as a *chansonnier* might, indeed, afford matter for long extracts, on very diverse subjects; but we cite these couplets, which were produced at a meeting in 1879, and which seem rather touching, in reference to the philosophic title of the *chanson* of which they form part: "Je ne veux pas rajeunir," and by the patriotic sentiments which they express:—

"J'ai vu nos cités tributaires
Payer de honteuses ransoms,
Et les cavaliers étrangers
Ont aux pieds foulés nos moissons.
Comme les vents, le sort varie;
Aujourd'hui je vois renaître
Le sol de ma belle patrie;
Non, je ne veux pas rajeunir."

But we must pause, though we have not spoken of Lesueur's charming retreat, which was built near Triel, on the bank of the Seine, and where he passed all the summer; nor have we spoken of his kindly and affectionate character, or of the just return for it from those around him, which soothed his long but green old age. These notes, nevertheless, though very incomplete, will, we hope, have some interest for our English professional brethren,

* The work was reviewed in our columns at the time. It then struck us as brilliant and imaginative, but fanciful; and in his criticism of Mr. Penrose's Parthenon studies Lesueur certainly did not show to advantage.

* In folio, 31 plates, of which many are double. Paris: 1855.

* The father of Leon Vaudoyer, who died a few years ago, and was an honorary and corresponding member of the Institute of British Architects.

inspired as they are by the desire to make known to them something of one who was an eminent master of French art.

A FRENCH ARCHITECT.
(Hon. and Corresponding Member
of the R.I.B.A.)

Paris, Dec. 31, 1883.

GERMAN TOWNS.

THERE is, perhaps, no country in Europe in which towns so truly represent the national development as in Germany. Almost every one of her great towns is a type in itself, points to some portion of her history, and forms, as it were, a landmark in her existence. Glancing at a few of the chief names, each of which has a story of its own, we find most of them synonymous with some phase of German life, present or past. Thus Dresden represents her art and literature; Cologne her religious feeling; Coblenz her military greatness; Bacharach and Boppard her legendary poetry; Heidelberg her university life; Nuremberg and Worms and Salzburg her Mediævalism; Munich her modern art; Hamburg her commercial greatness; and Berlin her national revival. When we pace the magnificent galleries of Dresden, and gaze upon the masterpieces of a Raffaele or a Holbein; when we view with wonder the collections of china, jewels, and armour, we feel that we are in a town where art is the leading motive, and good taste the ruling feature. Of all German towns, Dresden is most frequented by Englishmen. Half the people that daily assemble on the "Brühlocherterrace" are English residents. The magnificent Opera-house is almost as much visited by the English as by the inhabitants themselves; and we might perhaps say that it is the English element which gives the town its air of quiet dignity and peace. The streets are broad and clean, the bridges massive, and the churches, though they cannot bear comparison with those of other towns of equal magnitude, are nevertheless fine examples of a certain phase of modern Classic architecture. The grandest building in the town is the Opera-house, which is the most beautiful in Germany; while the "Grüne Gewölbe," the museum of armour and china, and the superb gallery, are places that must be visited and studied. They cannot be described, they must appeal to the feelings.

If Dresden is the type of what we might call the older modern art of Germany,—if it is the city most frequented by Englishmen,—there is another German town which typifies the modern schools of painting and sculpture, which attracts to its walls numbers of art-students from America, and which realises, as far as may be, the idea of a model modern town,—that is Munich: a town which does not look as if it had a past history, or as if it had grown and developed, but as if some ingenious architect had made an elaborate plan of it, ruled its streets into straight lines, pencilled out its squares and terraces, and deposited in the most painfully accurate places its gorgeous buildings, its frescoed temples, its triumphal arches, and square-cut houses. Munich is a magnificent town, but with all its magnificence it lacks the solemn grandeur of Dresden; sometimes it even lacks good taste. Its marble halls and palaces at times grow tedious, and its endless frescoes of muses and classical heroines make us wish again for the less Titanic but more homely conceptions of the artist of the fourteenth and fifteenth centuries. Munich is full of art, but not always artistic. Every statue has its fellow, every painting its rival; the columns of the Basilica are perfect; the friezes of the Glyptothek are without a flaw; and every temple is minutely correct; but we long for the old Gothic arch, the grotesque, the broken trellis-work, the gabled tower, and all those odds and ends of architecture and natural grouping that go under the denomination "picturesque." The town is beautiful and artificial. Those

"Avenues of broad white houses
Basking in the noontide glare,"

says a modern poet, who must have visited the capital of Bavaria on one of the hot summer days for which the place is so famous, and paced its great shadeless open squares under a powerful Continental sun. There is no wonder that the tired traveller, on such a day as that on which Calverley investigated the City of the Isar, extols the beer of the "Hof-bräu Haus," before he can with renewed vigour pursue his researches under triumphal arches and halls,

through palaces and galleries, Pinakotheks and Glyptotheks, to the extent of ultimately allowing himself to be carried up to the colossal Bavaria, and basked in the statue's head.

Another of the typical towns is Cologne. We have said that Cologne represents the religious feeling of the country, and, broadly speaking, this may be said to be correct. Though the Protestant element is but small, the magnificent shrines and fanes of Cologne are as much revered by Protestant visitors as by Catholic pilgrims; not so much from respect for religion as from love of art. It is Protestant money that has completed the cathedral, and the funds for the maintenance of the churches and sanctuaries are obtained more from the pockets of the inquisitive tourist than from the free gifts of the pious believer, however firmly he may trust in the truth of the skulls of the three Magi, the hand of St. Ursula, or the tooth of St. Geryon. Cologne, as Coleridge says, is "a town of monks and bones"; for the rest, it is no more what it was in the days of the poet. Since the finishing of the cathedral the aspect of the place has changed. The gloomy traditions that clung to the finest building in Germany, that told how the Devil had laid his curse upon it, and how it was never to be completed, have been swept away by the perseverance of the architect, and the city has awakened as with a burst of fresh life from its lethargy of Mediæval legend. Old houses that obstructed the view of the cathedral are pulled down, streets widened and thrown open, churches re-embellished. Since the year 1880, when all Germany assembled to see the pile completed, Cologne has been among the first cities to give an impetus to the new national feeling. "From Cologne over Ulm to Strasbourg," say the German architects; and the grand completion of the first stage of this work augurs well for the revivification of all the noblest edifices of Germany.

Cologne leads us out of the past into an era of modern revival; Nuremberg takes us back again into the very existence of the Middle Ages. We are in no town of modern times when we visit Nuremberg. We seem, indeed, to be threading the winding streets, and standing under the pointed gables of some old imperial burgher-town, expecting every moment to see a Gretchen, with neat lace collar and graceful pigtail, trip from some quaint carved doorway, and wreath one of the many sculptured shrines with votive flowers; or greet some burly knight in armour as he swaggers into the "Bratwurst-glocklein" to drink his bumper of "Bayerisch." On all sides is the town such as Adam Kraft might have left it; such as it might have been when the imperial visitors rode in procession up to the castle, and defied the intrigues of the Saxon Elector under the shade of Queen Cunigunde's lime-tree; or as Hans Sachs might have known it, when the neighbouring gossips came to hear the cobbler poet sing. We walk along the streets lined on each side with projecting houses; we cross canals and see bridge on bridge vanishing in the dim perspective. We go into churches that contain works in stone and iron which are among the finest in their kind,—indeed, the tomb of Peter Vischer, in the church of St. Sebaldus, is rivalled but by Ghiberti's gates at Florence. We pass the venerable mansion of Albrecht Dürer, which is now the rendezvous of the Dürer Club. We mount a winding road lined with lindens, and find ourselves in an old castle that is equalled by no other for picturesque. In the midst is the great five-cornered tower, a curiosity of architecture; all around are rows of ramparts, fosses now filled with trees, odd turrets, delicately-shaded steps, antique cornices, gabled towers, pieces of quaint iron railing, and fragments of coloured trellis-work. Inside the buildings are dark passages, groined chambers, old state apartments, latticed windows, panelled halls, rooms filled with all the relics of the Inquisition and Mediæval justice, and, amongst others, a gloomy cell, in which stands that demon of torture, the "iron maiden." Such is the old "burgh" of the Middle Ages, and Nuremberg is one of the last remaining towns that has preserved its castle, and even itself, untouched by the progress of civilisation. It has survived the storms of shot and shell that from the fifteenth century onwards have by degrees demolished many of the most venerable works on the Continent. An hour's blockade from modern guns, and the castle of Nuremberg would be no more. What a difference between the Mediæval and the

modern! It would take many hours to leave the fortifications of Coblenz. What a contrast between the graceful irregularities of the one and the gaunt upheavals of the other!

Coblenz, as we said, may be taken to represent German military greatness. It is situated on the junction of the Rhine and the Moselle; opposite it is the mighty rock of Ehrenbreitstein. The spot is one of the loveliest on the Rhine. It is difficult to express how the military genius of the engineer has lessened its beauty. All along the huge incline of rock are massive bastions, ponderous square towers, and straight, tedious ramparts of white stone, embellished with nothing but loopholes. The town itself is without artistic interest; there is a starched military air about it which forbids art. Every other house is an arsenal, every other man a soldier. The tight-strapped, well-buckled Prussian officer curls his moustache, and looks with satisfaction on the creaseless tails of his trousers, and no doubt in his way adds much to the dignity and majesty of the military town; but if we look for artistic beauty outside the army hosiery department, we must not go to Coblenz.

A little higher up the Rhine are the two small towns that we have selected to represent the legendary poetry of Germany,—Bacharach and Boppard. Boppard stands on a bend of the river, and opposite one of the most romantic ruins in the whole Rhine valley, the twin castles of Sternberg and Liebenstein; and Bacharach beneath the brow of a hill that bears on it the rambling ruins of castle Stahleck, and the graceful sandstone columns of the "Werner's Kirche." All around the place teems with legends. Every rock, every bend in the river, every turn in the road, every erection,—be it the lofty castle, the graceful church, or the wayside cross,—has some tale to tell, some strange legend to unfold. It needs but a fine moonlight night and a vivid imagination, and we are plunged into a fairyland of dreams; we hear in the splash of the boatman's oar the dance of the Rhine nixie. We see in the moonbeams that peep through the gaps of the ruined wall the form of some phantom lady. The drowsy humming of the wind is as the swarming of elves and fairies. In the moving lights on the opposite shore we see the glittering pageant of knights in armour. In the singing of some unseen village maiden we hear the mystic music of the Lurelei.

Though the Rhine ruins are lovely, there is one ruin in Germany which surpasses all others in magnificence,—the stately castle of Heidelberg. Situated on the side of a range of hills, it commands a splendid view over the Neckar valley and the snug city of Heidelberg, which lies beneath it. Built of the red sandstone so common in those parts, its different styles of architectural adornment harmonise as much in their entirety as in their partial state of ruin. French powder has done its work relentlessly, but even French powder has added to the beauty of the spot. Of the various buildings, those that are but partly destroyed are being carefully renovated from the old plans, and those that are too far gone for reparation have been claimed by nature as her own, and are being bedraped with the beautiful foliage and verdure with which the place abounds. Besides the castle there is not much of artistic interest in the town itself. The real interest lies in its being the typical town of German student life. It represents the "Jugend Jahre" of the country. We inseparably connect Heidelberg with the "Commerce Büch" of national song, with the neatly shaded floors of inn rooms, festooned with ivy garlands, and decorated with drinking-horns, with the clubs of jovial students, with good nature, merriness, and hospitality. There is an air of content and happiness in Heidelberg which is more or less expressed in everything, whether it be in the loveliness of the woodland scenery, or in the neat cleanliness of the streets, or in the swagger of the corps students with their many-coloured caps, or in the benign look of the portly professor as he returns from his morning lecture.

From Heidelberg, the pretty university town, it requires some stretch of imagination to plunge us into the bustle and activity of Berlin, the great capital. Berlin is also one of the new towns, and new particularly in the last ten years; for it represents the fresh burst of national feeling that has awakened in the breast of the nation since the Franco-German war. Unlike London, where the art of each generation has succeeded the fore-

going, where pile has been heaped upon pile, till we have one vast mass of magnificence and ugliness, while everything alike is covered with the impartial grime of smoke; unlike Paris, where the beautiful city of a monarchy has been turned into the beautiful city of a republic and an empire, till it has become the most beautiful city of the world; Berlin has little to tell of the past, and has sprung into life so unartificially in the last few hundred years, that much of its art is too unreal and showy to be pleasing. There is a cold, unsympathetic atmosphere about the town, and often an air of snobishness in its decoration, and in the people to be met in its streets. The famous avenue, "Unter den Linden," is scarcely worth the name, and cannot be compared to many of the boulevards of Paris or the parks of London. But Berlin is fast becoming the home of many of the treasures of modern art. Frescoes of Kaubach and paintings of Makart and the best of modern German painters, adorn its halls, while its galleries and squares contain most of the finest works of Canova, Thorwaldsen, Schinkel, and Danneker. Of the way in which the Berlin art collections are being added to we have abundant evidence every day; it is not long ago that the city of Berlin gave a better price for certain manuscripts, which should never have left England, than our own Government. The curse of Berlin is officialism, and that air of swagger and parvenuism which attends the surroundings of a new dynasty. We see it in all alike: in the theatre and in the art exhibitions, in the tramway officials and in the portly dignitaries of the imperial household, in the fashionable hotels, in the magnificent palaces of Potsdam.

To close our hasty sketch of typical German towns, we have but one more to mention, and that is the great town which represents the nation's commerce, the venerable Elbe town, Hamburg. Commerce is the mainspring of a nation's political timepiece, and if any city represents commerce in its widest sense, it is Hamburg. Carrying on the traditions of the old Hanseatic league, of which it was once the head, it still preserves the pomp of municipal freedom, though shorn of most of the reality. It is a town of merchants. In Hamburg every one is a merchant; and if he does not elect the merchant's vocation, there seems to be something in the surroundings which makes him a merchant by nature. Every stranger to Hamburg first pays a visit to the houses where, standing on the lofty gallery, he is impressed by the roaring mass of human beings down below, who discuss the mercantile politics of the day. Art in Hamburg there is little or none. The good merchants of the olden days went in more for snug living than for high artistic feeling. But there is a good deal of natural art, or what is commonly called picturesqueness. The town is divided into two parts; each has its beauties. The modern part, consisting of noble streets, shady gardens, palatial villas and residences, situated around a beautiful lake, marks the abode of the merchant of to-day. The old part, intersected by canals, and lined with antique houses with gabled roofs, decorated by quaint churches, and bordered with old-fashioned wharfs and quays, marks the abode of the merchant of the past. One of the chief things that strike the seeker after beauty in Hamburg is the diversity of colouring in the old part of the town. Here is an ancient row of houses, with gables of red tiles, and faced with deep-tinted stones and carved and coloured beams; here the sombre canal, lined with old brown warehouses, from the windows of which hang ropes and pulleys; often there are to be seen barges freighted with coals or white sacks of grain; behind the red roofs of the houses rise the spires of churches, many of which, on account of their copper casings, have turned green with age, and present a most beautiful appearance when the sun shines on them, and lights up their tints of emerald and grey, and their bright golden weathercocks; here, on one of the many bridges that join street to street, we see the drayman, with the help of his dog, bringing his car full of scarlet milk-pails to the market-place; at another corner of the street, perhaps, we see a flower-girl in her picturesque and spangled costume, almost the only surviving national dress of North Germany; another bend of the road brings us face to face with the finest church in Hamburg, the Church of St. Nicholas, the work of our own Gilbert Scott, and outside is the market-place, where every possible harmony and discord of colour is to be seen. But

the grandest part of Hamburg is the harbour; it is the true life of the town. Standing on the hill of the Observatory we see stretched beneath us that noble river, the Elbe, which the thrifty merchant of Hamburg has known so well how to make use of. We see the long rows of wharfs and storehouses, docks leading into docks, quays, and sluices, branches of the river artificially barricaded up and covered with shipping of all sorts and sizes, while all around and fading away into the distance is a vast network of masts. We look on all this, we see the teeming, toiling mass that lies beneath us, around us, beyond us, and we feel that we are in the great merchant town of Germany.

THE IRON TRADE IN 1883.

The course of the iron trade in 1883 must be described as unsatisfactory, whether we look at home or abroad. Apprehensions were felt at the opening of the past year which have been fully realised. It is a remarkable fact, however, that those fears were based upon the well-known excess of production over consumption which was taking place, and yet, notwithstanding that knowledge, which has been still more brought home gradually to our iron and steel manufacturers by the great falling-off in exports (they were 297,023 tons less by the end of November than for the corresponding eleven months of 1882), it appears to have been, and is still, entirely ignored by them. No steps have as yet been taken to check over-production. It is difficult, under the circumstances, to foresee the end of the depression ushered in at the beginning of 1883. At that time, the feeling pervading all branches of the English iron trade was much less sanguine than had been experienced at that period in previous years. We are now compelled to confess that the feeling was perfectly justified, for the year of which we have just seen the end closed with a depression scarcely less pronounced than that witnessed prior to the revival of 1879. There were various causes at work to produce the depression of the past year. The over-production has already been referred to as a circumstance difficult to understand. The uncertainty which prevailed regarding the effects of the readjustment of the American tariff was another disturbing element in the prospects of the iron trade of this country. It was hoped that the revision would benefit our manufacturers. The result has been the reverse. The change in the trading relations of the two countries has been for the worse, for, whilst the requirements of the United States have diminished owing to a falling-off in railway construction, the increased capacity of production of the States has put another obstacle in the way of an active trade with that country. The decline in our exports to the United States has been most marked, for, whilst during the first eleven months of 1882 they had been 1,121,755 tons, only 650,900 tons, or 470,855 tons less, were shipped in the corresponding period of last year. The falling-off in our shipments to the United States was made up to some extent by larger exports to other countries, but there still remains, as stated above, a deficit of nearly 300,000 tons for the first eleven months of 1883.

In the same way that exports last year fell off slowly, but surely, month by month, prices declined steadily and uninterruptedly. In most cases it was more noticeable towards the end of the year, and values have now reached a point below which it is almost impossible that they could go; and this remark applies to pig-iron as well as the finished product. One of the staple articles of the North of England, No. 3 Cleveland pig, was 43s. 6d. per ton in January last; it is now 36s. 3d., and even less is taken for it. This is a drop of 7s. 6d. per ton, equal to 17 per cent. Scotch pig-iron warrants were selling at Glasgow at the beginning of 1883 for 48s. 6d.; they kept up pretty well at that price until August, when no more than 47s. 6d. could be got for them. They have since fallen to a fraction over 43s., which represents a decline of 5s. 6d., or 11 per cent., on the year. This decline took place, notwithstanding that shipments both of Scotch and Cleveland iron were well maintained. In the latter case they show a considerable growth, for while for the year 1882 they amounted to 931,273 tons, they were, in 1883, larger than during any previous year, viz., 992,815 tons. The shipments of Scotch pig-iron during the past year were 647,000 tons, against 645,000 tons in 1882.

The fall in prices has been more serious in manufactured iron and steel. Ship plates, for instance, another of the staple products of the North of England, were quoted in January last at 6l. 10s. to 6l. 12s. 6d.; at the end of the year they were as low as 5l. 12s. 6d., showing a decline of 1l. per ton, or nearly 16 per cent. In the Black Country, marked bars opened at 8l. per ton in January, and closed at 7l. 10s. in December, having been maintained at the latter figure nearly throughout the year. In Staffordshire, plates were quoted in January at 8l. to 9l. 10s.; in December, 8l. to 9l.,—angles, in January, 7l. to 8l. 15s.; in December, 7l. to 8l. 5s. These figures show that values have been very well maintained in the staple articles of the Midlands. Steel rails have receded in a more marked manner, for they can now be bought at 4l. 5s., and even at 4l. 2s. 6d. at works, whereas in January, 1883, they were fetching 5l. 5s. This decline of fully 20 per cent. in value has taken place, moreover, notwithstanding large exports. Whilst the decline in prices of steel may be explained by the falling-off in the demand from the United States, the serious drop in shipbuilding iron, which is almost entirely for home consumption, must be ascribed to the dulness which has gradually crept over one of our great national industries, shipbuilding. Nearly all the other branches related to the iron trade have been well employed, engineers especially having had their full share of work. If we finally state that the tinplate industry has been in a slightly better condition after the collapse of the closing months of 1882, and that business in the hardware branch has not suffered much, although lower prices had to be accepted, we have sketched the principal features of last year's iron trade.

The low prices which we have quoted show the extent to which both the raw material and manufactured product have been affected in the general decline of values in the iron trade. But they also indicate the difficulties with which manufacturers will have to contend in the future, or at least as long as the depression lasts. They have had during the past year troubles also in another shape. Last July witnessed a strike amongst the ironworkers of Staffordshire, and minor disputes also took place in the steelworks of South Wales and Cleveland. But, with all their anxieties, and notwithstanding low prices, ironmasters have been able to keep their establishments going, for there has never throughout the year been an actual want of work. It is difficult to say what the year upon which we have just entered may bring, but there is some justification for believing that there will be no actual want of employment, although rates will be unremunerative in some departments. The best that may be hoped for is that the year before us may not prove worse for the English iron trade than the one upon which we look back.

There is little to add with respect to the iron trade of the Continent. The past year has proved, if proof were required, that the English is still the ruling iron market, if not of the world, at least of Europe. Whether we look to Belgium, France, or Germany, the movements in the English iron trade are faithfully reflected in the markets of those countries, notwithstanding that the industries of the two latter are so fully protected by heavy tariffs. The markets of all three have been as depressed as that of England, the depression deepening, as here, towards the closing months of the year. The decline in prices there has been as heavy and as steady and uninterrupted as with us, notwithstanding that nearly all branches of the iron trade have been fairly well employed throughout the year. If an exception be permissible, it should be made, but only partly, in the case of Austria. The demand has been active in the Austrian iron trade, but prices have been kept in check, to some extent, by the successful competition of other countries, whose manufacturers were able, notwithstanding the prohibitive Austrian tariff, to throw large quantities of iron upon the Austrian market. The increase in those imports exerted a depressing influence, and led at last, towards the end of the year, to a decline in prices. Thus, in Austria, Styrian charcoal pig fell about 3 florins per ton on the year; Styrian bar iron, 5 florins; joists, 5 florins; steel rails, 6 florins; in Belgium, Belgian foundry pig receded 8 francs; bars, 12 francs; ordinary plates, 22 francs; steel rails, no less than 35 francs. The depreciation in value was equally serious in France,

where pig-iron declined 7 francs and manufactured iron 20 francs on the year. In Westphalia pig-iron was sold at the end of December 10 marks cheaper than it fetched in January; bar iron was 25 marks lower, and steel rails had been depreciated 12 marks.

With regard to the American iron trade during the past year, it need only be repeated what has already been referred to, that the check to the activity in railway construction in the United States had an immediate effect upon the American iron market. Values gradually became affected to a serious degree. Thus, whilst American pig-iron No. 1 sold in January at 24½ dollars to 25½ dollars per ton, it closed in December at 20½ dollars. Naturally, Scotch pig-iron (of which 126,720 tons were imported into the States in 1883, against 143,868 tons in 1882) went down in sympathy with the American crude product. Steel rails were sold in January last at 40 dollars; they are now down to 34 dollars. So great has been the depreciation in some of the products of the American iron trade that a movement for closing works began in November, and although that step has been adopted by only a few manufacturers, its mere suggestion shows that the state of the American iron is, like that of Europe, far from satisfactory.

A BLOT ON OUR SANITARY MECHANISM.

A source of preventible mischief in the carrying out the details of sanitary improvement, as to which we did our best to call attention during the discussion of the legislative measures of 1872, has now come to the fore; and is under discussion in the daily press. Our own remarks and recommendations on the subject were generally applicable to the whole country, although it was rather the circumstances of the rural districts that were chiefly regarded in our anticipations. But it is as bearing on the burning question of the improving the dwellings of the London poor that, in the judgment of those of our contemporaries to which we refer, the shoe now chiefly pinches. The point in question is the position of the medical officers of health. Our anticipation was that in the rural sanitary districts, where the largest ratepayers might be expected to keep the key of the public toll, and to keep it with the narrow care natural to those on whom the burden of supplying the contents were likely mainly to depend, the disposition of the Authorities to keep down expense might lead to a strong opposition to those recommendations of either the medical or the surveying officers of health which involved any serious expenditure that it was possible to defer or to avoid. How far this anticipation has been fulfilled it is perhaps not very easy to say. There can be little doubt that tendencies which are rooted in human nature itself must have had a powerful influence. On the other hand, the growth of the local expenditure has far exceeded anticipation, and is one of those points which reflective persons regard with no small anxiety.

The function of pointing out cases in which the neglected abodes of the poor become the seedbeds of disease is, it is urged, essentially that of the medical officer of health. Without admitting that this is exclusively the case, the statement is undeniably true in itself. But unfortunately, it is added, scarcely any of the medical officers in the metropolis are debarred from private practice, and the result is that their public and their private functions conflict with one another very seriously. In some cases, it is added, "some have frankly confessed that their hands are tied by the conditions of their appointment. Few are paid sufficiently highly to allow them a subsistence independent of practice, and all are removable at the pleasure of their masters, the Vestry, or District Board, without cause assigned." It is added that out of the fifty health officers of the metropolis, there are only three or four who devote their whole time to the performance of sanitary functions, so that districts containing over a quarter of a million of souls, and between 20,000 and 30,000 houses, have to content themselves with such time as the officer can spare from his private work. To this is added the difficulty which we originally pointed out. "How is it possible in a poor neighbourhood, where paying patients are rare, for the medical officer to treat with absolute impartiality the house property of the vestryman, who is one of his best patients, and

who may, perhaps, have influence enough at the vestry to secure his dismissal from office if he makes himself obnoxious by his activity?" This sentence almost reads like a reproduction of one of our own, written in 1872. But we must confess that it has even a more terrible significance as applied to a poor urban neighbourhood than it had while the attention was fixed on a poor rural district.

The evidence given last year before the Select Committee on Artisans' and Labourers' Dwellings is cited as especially confirmatory of the existence of this blot on our health organisation. "I have known in my own parish," says Mr. Goddard, Chief Surveyor to the Metropolitan Board of Works, "houses to be destitute of water for a couple of years, and the man who was the owner to be sitting as a vestryman, administering the law of the parish." Again Mr. Goddard refers to the case of "a medical officer who, not so very long ago, was got rid of in very quick time because he discovered that some of the vestrymen held some of these houses, which were in a wretched condition, and he demanded certain alterations, which they did not think fit to carry out." It is really unnecessary to add any further proof of the results of leaving the medical officers in a condition of absolute dependence on the Local Authority.

By way of cure for these great evils, the *Morning Post*, in a thoughtful article on the subject, suggests the permanent appointment of medical officers, at a liberal salary, and with a practical fixity of tenure. That, no doubt, might be highly desirable; but whether it is attainable is another matter. The placing the power of appointment in the hands of some body more independent than the vestries is another suggestion, and so is the proposal that the dismissal of an officer should be subject to the veto of the Local Government Board. Our own suggestion, made at the time of the passing of the Act, was still more simple, and ten years' experience has not led us to doubt that it would be to a considerable extent effective. It was that every report, whether of the medical or of the surveying officer, should be sent in duplicate, one copy to the Local Authority, and the other to the Local Government Board, or its appointed officers. The mere knowledge that the facts were laid before a higher authority would be enough, in many cases, to prevent the absolute ignoring of any report. On the other hand, the conviction that he was bound to satisfy his own superior officer, as well as his local masters, would give to the report of the medical officer something that it may now want. "How can I help reporting?" he would ask. "I may get into hot water myself if I hold my tongue." The proposal, which was laid before the framers of the Bill, was declined on the ground of tending to centralisation. It may be doubted whether that kind of centralisation which should induce or even compel local authorities to look with heed to the discharge of their proper duties would deserve to be regarded as an evil.

We do not now wish to insist that this mode of organisation is the only way in which the evil arising from the solitary and dependent position of the officers of health is to be remedied. Any simpler suggestion, if such can be made, will be welcome.

The fact is, that the expectations of the framers of the sanitary legislation now in force omitted one element in the problem that they had to solve. They betrayed an utter ignorance of human nature. To suppose that in a matter so new to most people, and so little credited by a very large majority, as sanitary improvement, improvised local authorities would guide their decisions by sanitary principles, or would turn a ready ear to the experts who should tell them what was required, was to credit the class of persons in question with a degree of information, to say nothing of any moral qualities, to which few often would lay claim. To suppose that the expert,—medical or other,—would sacrifice his time, and probably his place, to the effort to convince the board, was equally unwise. Spend, indeed, the authorities do, but in the utter absence of organisation, and of the means of informing one district what experience has been gained elsewhere, there is a great probability that much of the expenditure incurred by the local boards, prodigious as it has become, has been far from economical or wise. So marked have these evils become in London that the public are now regarding them with as much dismay as if they had not been the natural and predicted result of

the disintegrated character of the machinery created by the Public Health Bill. That something will now be done, in the Metropolis, to remedy this mischief, is probable. The focus of public notice has been turned on the blot; but how much has the entire country suffered from the same cause? That is a question not easy to answer. One thing, however, is clear,—improvement is needed. How is it to be effected? Is it to be improvement in human nature, or improvement in the details of hasty and ill-advised legislation? It may, no doubt, be difficult to effect the former; but to await the latter is to do something that reminds us of the line of the Latin poet as to the rustic who waits till the river shall have run by,—

"Rusticus expectat dum defluerit amnis."

COMPETITIONS.

Oldham Workhouse Schools.—In the second competition for these schools there were thirty-seven competitors, and the *Guardians* have awarded the first premium (50*l.*) to the design bearing the motto "Hope," and the second premium (30*l.*) to the design marked "F. S. A." The third premium of 20*l.* was awarded to "Faith." "Singularly enough," says a local paper, "the first and third premiums were found to have been secured by Mr. Alexander Banks, of Rochdale-road." The author of the second premium is Mr. Wolstenclough, of Royton. The paper from which we quote speaks of the impartiality of the *Guardians*, but we do not gather that they were assisted by a professional referee. The sum which the *Guardians* were prepared to expend was from 9,000*l.* to 10,000*l.*; but according to Mr. Banks's estimate, the cost will be no more than about 8,400*l.* The tender which the *Guardians* had to face on the occasion of the last competition was 15,000*l.*, and one was even so high as 20,000*l.*

DECORATIONS AT WORTLEY HALL.

We give this week an elevation, in chromo-lithography, carefully reproduced from Mr. Poynter's drawings, of a portion of the decoration carried out from his designs and sketches at Wortley Hall, the seat of Lord Wharnccliffe, who is also the fortunate possessor of several of the more important of Mr. Poynter's pictures, including the well-remembered "Perseus and Andromeda." To this we have added a sheet in monochrome, traced from Mr. Poynter's pencil sketches, for the ceiling of the same room, and also a reproduction of one of his larger pencil sketches of the details of part of the frieze, the centre portion of one of the sides not shown in the coloured elevation. This, of which the original is merely a slight pencil sketch on tracing-paper, is an admirable bit of artistic work, giving in a most life-like manner the action of the bird in the endeavour to stretch its neck while preserving its balance on the swinging perch or hoop to which it clings.

The coloured plate represents the frieze of the central portion or lantern of the billiard-room, with an attic and windows over; the monochrome drawing represents one-quarter of the coved cornice and central ceiling immediately over the attic, the outside line of the border in the monochrome drawing coinciding with or rising from the top-line of the attic in coloured plate. None of the drawings and sketches which Mr. Poynter was kind enough to lend us for illustration had any scale on them (painters are less particular in this matter than architects), and under these circumstances the chromo-lithograph has been somewhat reduced for the exigencies of printing, the object, of course, being to show the character of the design, not to give "working drawings," which the originals cannot be said to be in the ordinary acceptance. The centre line of the coloured elevation, compared with the centre line of the ceiling-plan, will easily point out the relation of the two to one another.

The coloured plate reproduces, we think, as far as mechanically applied colouring can ever do, the rich and harmonious effect of Mr. Poynter's scheme, and shows the playful manner of treatment adopted, as, for instance, in the treatment of the pilasters, the lower and upper portions of which are alternately contrasted; the system of alternation between gold and silver will also be noticed, in the dotting which takes the place of a modelled ornament at the lower part of the architrave,

the ornament round the windows, the treatment of the sides of the pilasters with silver, while the front face is lined with gold. This alternation of silver and gold is carried out in many parts of the ceiling design also. The main character of the decoration, it will be seen, is of that light and graceful, though certainly not very logical, character which marks one phase of the Renaissance school, and which has always been dear to painters and modellers on account of the opportunity it affords for the drawing or modelling of varied forms of flower and animal life, mingled together on little system or principle of decorative treatment, certainly, but presenting so many points of interest for close inspection, as well as a bright and festive general effect, and appealing to our artistic and historic associations as connected with and recalling one of the greatest and richest periods of art. There is, however, one position of the design in which Mr. Poynter shows no Renaissance recollections but is solely himself, and that is in the charming and highly characteristic treatment of the stained-glass windows, which we feel sure will meet with the general admiration of architects. He has succeeded in producing a treatment quite suited to the condition of stained glass, quite original, and which yet does not seem out of harmony with the character of the rest of the work. Now, inasmuch as a true and suitable style for stained glass treatment in Renaissance architecture has never been worked out, as it has in Gothic, and can hardly be said to exist, we cannot but think that the treatment shown here ought to prove a very valuable bit of suggestion for stained glass design of an unobtrusive but truly decorative character.

In regard to the ceilings, which we are only able to show in monochrome, we may add a note or two on the colour treatment. The bold floral design, sweeping in such fine curves round the cove of the ceiling, is in gold on a deep blue ground; the wide plain fillet or scroll separating it from the centre is a plain band of gold; in the repeated ornaments gold and silver are alternately employed, and the key pattern consists of a gold pattern and a silver pattern interlocking with each other, the parallel lines surrounding it being also alternately gold and silver, on a deep blue. The band of ornament which comes within this is in gold and silver on a red ground, and in the centre portion the deep blue ground is resumed, the fan ornaments being gold, except the centres; the birds and plants silver.

The whole design bears testimony to Mr. Poynter's feeling for rich decorative effect in design of this class, and it has an additional value from the careful study and drawings of the birds and the floral details.

AN IRON CURTAIN.

IN the new Prince's Theatre, forming part of Mr. Phipps's new buildings in Coventry-street which we illustrated a few weeks since, special preparations are being made to check the spread of fire, in case of the occurrence of any such danger, to which theatres are so peculiarly liable. The proscenium-wall separating the stage from the auditorium rises from the basement and is carried right up through the roof, and the proscenium opening is entirely closed by an hydraulic fire-proof curtain which, under the direction of the architect, has been constructed by Messrs. Clark, Bunnett, & Co. This curtain measures 32 ft. 6 in. by 26 ft. 6 in., and is constructed of two screens of wrought-iron plates, $\frac{1}{4}$ -inch thick, forming a double division with an air-chamber between of 6 in. The top portion of the curtain is framed or riveted to double wrought-iron rings secured to the head of an hydraulic ram, fitted with cylinders on each side of the proscenium opening. The supply of water for working the hydraulic rams is laid on from tanks placed on the top of the building. With an expenditure of only 81 gallons of water the curtain, weighing about 71 tons, can be raised or lowered in fifty seconds. The movement for working the curtain is in the prompter's box; and the prompter, by simply moving a lever, can drop the curtain, thus forming with the proscenium wall a solid fire-proof division entirely separating the stage from the auditorium, so that in case of fire on free from danger. On the stage, fire hydrants of the most improved construction are fitted, and connexions laid from the New River

"DESERTED."

"My tabernacle is spoiled, and all my cords are broken: my children are gone forth of me, and they are not."—Jas. x. 20.

THIS terrible picture of the desolation which was to fall upon Jerusalem and the cities of Judah is one which must often have been witnessed in ancient times and even in the Middle Ages. In a previous chapter the Prophet uses the following expressions:—

"For death is come up into our windows and is entered into our palaces to cut off the children from without and the young men from the streets," showing that one of the punishments which was to fall upon the city was pestilence. When we read of ancient cities, such as Memphis, Thebes, &c., and think of their vastness, immense wealth, and magnificent buildings, one is inclined to ask, "And is London, with its 3,000,000 of inhabitants, to share the same fate?"

Fortunately for us, we do not labour under the difficulties which beset cities in early times, or even in the Middle Ages. Plagues of one kind or another were of constant occurrence. At one time it was the "black death" which depopulated whole regions; at another it was the sweating sickness which decimated the whole land; then last, but not least as to its terrors, the plague itself. We are, perhaps, too ready to blame our Medieval forefathers for this state of things. We take it for granted that their towns were unhealthy, because they neglected sanitary precautions. That they were ignorant of many matters, such as the best mode of supplying water to towns, sewage arrangements, &c., must be allowed, but there is no reason to suppose that they neglected, as a rule, such precautions as they knew to be useful. It appears, however, from Erasmus that we English were behind the rest of the world in his time as to the sanitary arrangements of our houses. He says,—

"First of all, Englishmen never consider the aspect of their doors and windows; next their chambers are built in such a way as to admit of no ventilation. Then a great part of the walls of the house is occupied with glass casements, which admit light, but exclude the air, and yet they let in the draft through holes and corners, which is often pestilential and stagnates there. The floors are, in general, laid with white clay, and are covered with rushes, occasionally removed, but so imperfectly that the bottom layer is left undisturbed, sometimes for twenty years, harbouring excretions, vomitings, scraps of fish, and other abominations not fit to be mentioned. . . . I am confident the island would be much more salubrious if the use of rushes were abandoned, and if the rooms were built in such a way as to be exposed to the sky on two or three sides, and all the windows so built as to be opened or closed at once, and so completely closed as not to admit the foul air through chinks, for, as it is beneficial to health to admit the air, so it is equally beneficial at times to exclude it. . . . More moderation in diet, and especially in the use of salt meats, might be of service, more particularly were public ediles appointed to see the streets cleaned from mud and urine, and the suburbs kept in better order." . . .

The very fact that Erasmus lays such stress upon these sanitary defects in our English houses and streets seems to show that they did not exist in other countries which he had visited. That the streets of Old London were excessively narrow, frequently less than 20 ft. wide, that shambles or slaughter-houses and hospitals were erected within the walls of the city in the midst of these narrow, closely-built streets, is proved by the fact that Sir Thomas More in his "Utopia" describes the Utopians as building all their streets at least 20 ft. wide! and placing all shambles and hospitals outside the walls of their towns! But in the Middle Ages these suggestions, however advisable, could not be generally adopted. A town had necessarily to be, before all things, strong enough to resist the attacks of an enemy besieging it. This, of course, in those days meant that it must be surrounded by high walls and a moat. The latter too often, from the very necessities of the case, was filled with stagnant water. Every inch of space within the enclosure of the walls was occupied by buildings. Then, again, we must take into consideration the difficulties of obtaining provisions; fresh meat during the winter months was scarcely procurable, few vegetables were known that would stand the winter's frost, and

probably, none but the rudest methods of preserving fruits were practised. Their knowledge of medicines was a mixture of quackery and superstition. Some of the "cures" for the "sweating-sickness," for instance, were highly unscientific. Here is one of these marvellous nostrums:—"Take three large spoonfuls of water of dragons and a quarter of a spoonful fine treacle of Geau, and half a nutshellful unicorn's horn scraped small!" &c. To this must be added the practice of burying the dead within the walls; but how was it possible to avoid these evils, and what chance had the unfortunate plague-stricken people of being cured of the terrible disorder when the doctors gravely prescribed "water of dragons" and "unicorn's horn scraped small!"

Siege was too often followed by famine, and the famine by pestilence, and then the grand old city declined, decayed, and in the end became deserted.

Is there not here a warning to our own huge city? Will not the words of Jeremiah, "Death is come up into our windows," apply to many a fever-haunted back slum of London? Does not, alas! disease "cut off the children from without," and the young men from the streets, in districts made loathsome and foul by grasping landlords and jerry builders? Think what would be the result if "the plague" or the "sweating-sickness" were to break out in London with its three millions of inhabitants! We cannot plead the excuses which our Medieval forefathers were able to do. Our city is not necessarily crowded; it is not walled or moated. Abundance of wholesome food can be procured in the winter. We can obtain fairly good water in large quantities. Our dead are not buried in our midst, and the way of removing sewage is well understood. But even these comforts and advantages should not make us forget that morality and cleanliness have their laws, which cannot be disregarded with impunity, and if nothing is done to remedy the evils which the press is every day bringing to light at the East End of London, some terrible scourge in the way of sickness may break out, and London itself may become, if not absolutely deserted, decimated. Our illustration is a purely imaginary scene, intended to convey the idea of a Medieval city which, after suffering the horrors of plague, has been entirely abandoned and left to fall to ruin.

H. W. B.

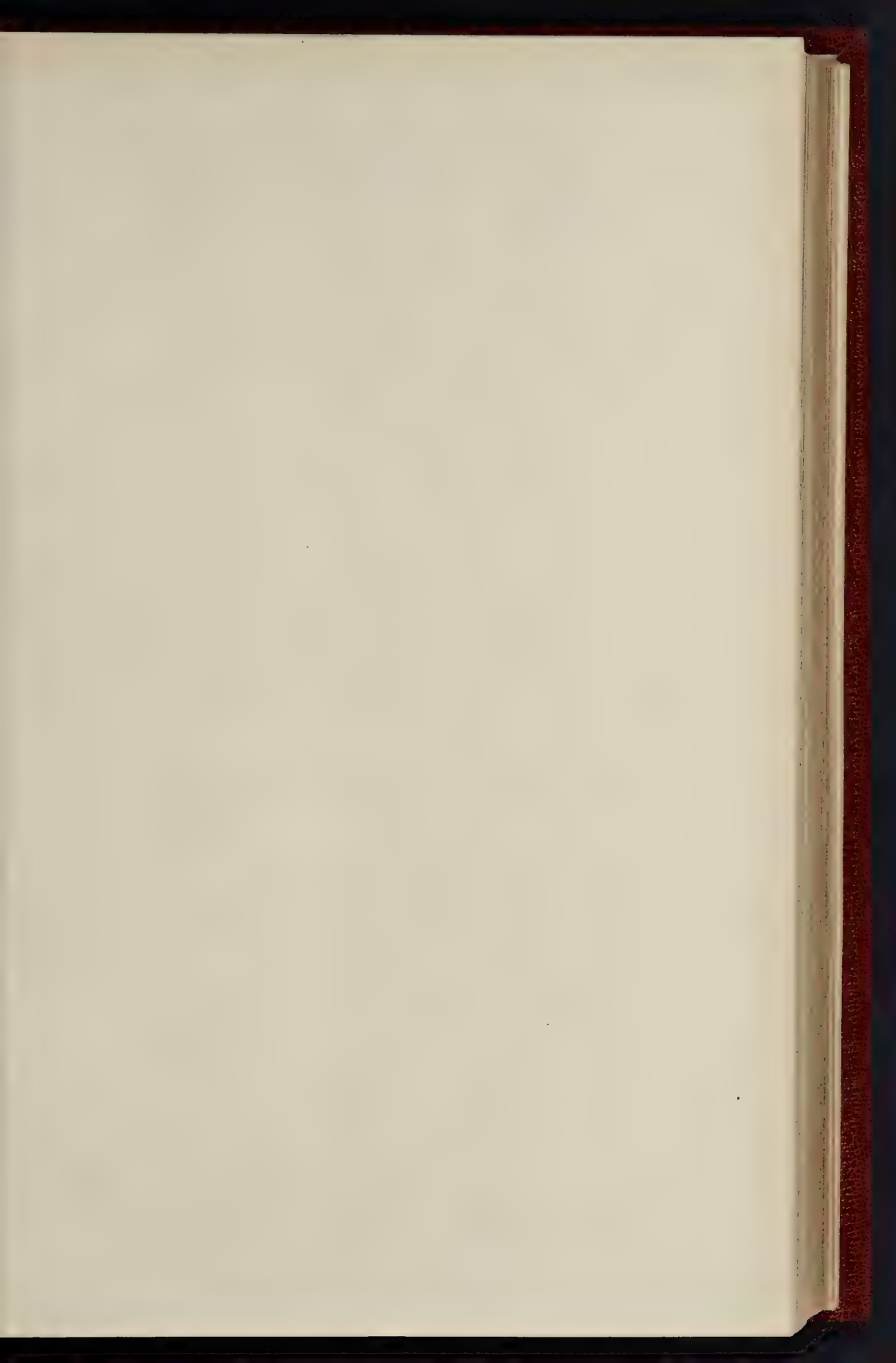
MODERN BERLIN ARCHITECTURE.

WE give views of two mansions forming part of the modern architecture of Berlin, in the Regenten Strasse and the Friederich-Wilhelm Strasse respectively. The latter may stand as a good specimen of the rather exuberant style of Renaissance architecture which appears not out of place as representing the luxurious side of the life of a great capital, though not certainly representing the higher elements of architectural force and expression. It errs, in short, on the side of being what must be called "showy" and deficient in breadth and repose, though not without a good deal of clever and effective treatment in detail. The house in the Regenten Strasse shows higher qualities of architectural design; the details are rich and elegant; the deep masses of shadow of the portal and recessed balcony over contrast forcibly with the light space of plain masonry; the sculptured bas-relief above the ground-floor windows is happily introduced, where such sculpture should be placed,—not too high up to be properly seen.

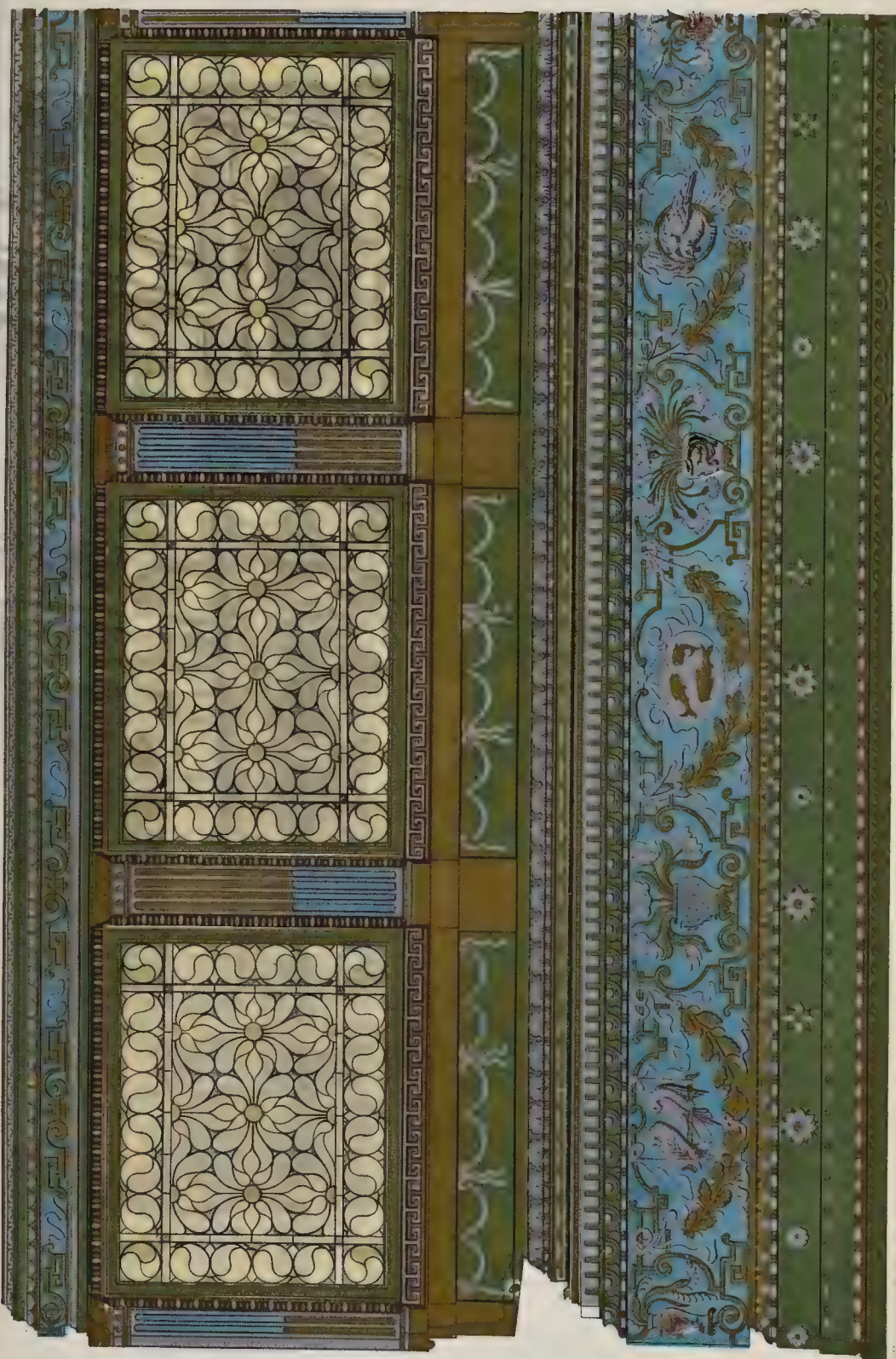
The views are engraved by Mr. J. D. Cooper, from photographs. We regret that up to the time of going to press we have not been able to obtain the names of the architects, which we may be enabled to give in a future issue.

The late Mr. Holloway's Gifts to the Nation—Of the Sanatorium at Virginia Water and the College at Egham the following illustrations have been published in the *Builder*, viz., *Sanatorium*: Two-page view, vol. for 1877, p. 712; enlarged view of central portion of building, and plan of the whole building, vol. for 1875, pp. 645-47; view of interior of recreation-hall, vol. xlii., pp. 16, 17. *College*: View in East Quadrangle, vol. xli., p. 456. Mr. W. H. Crossland is the architect of both buildings.

* Appendix to preface, "State Papers of Reign of Henry VIII., by the Rev. J. S. Brewer," p. cxxiii.





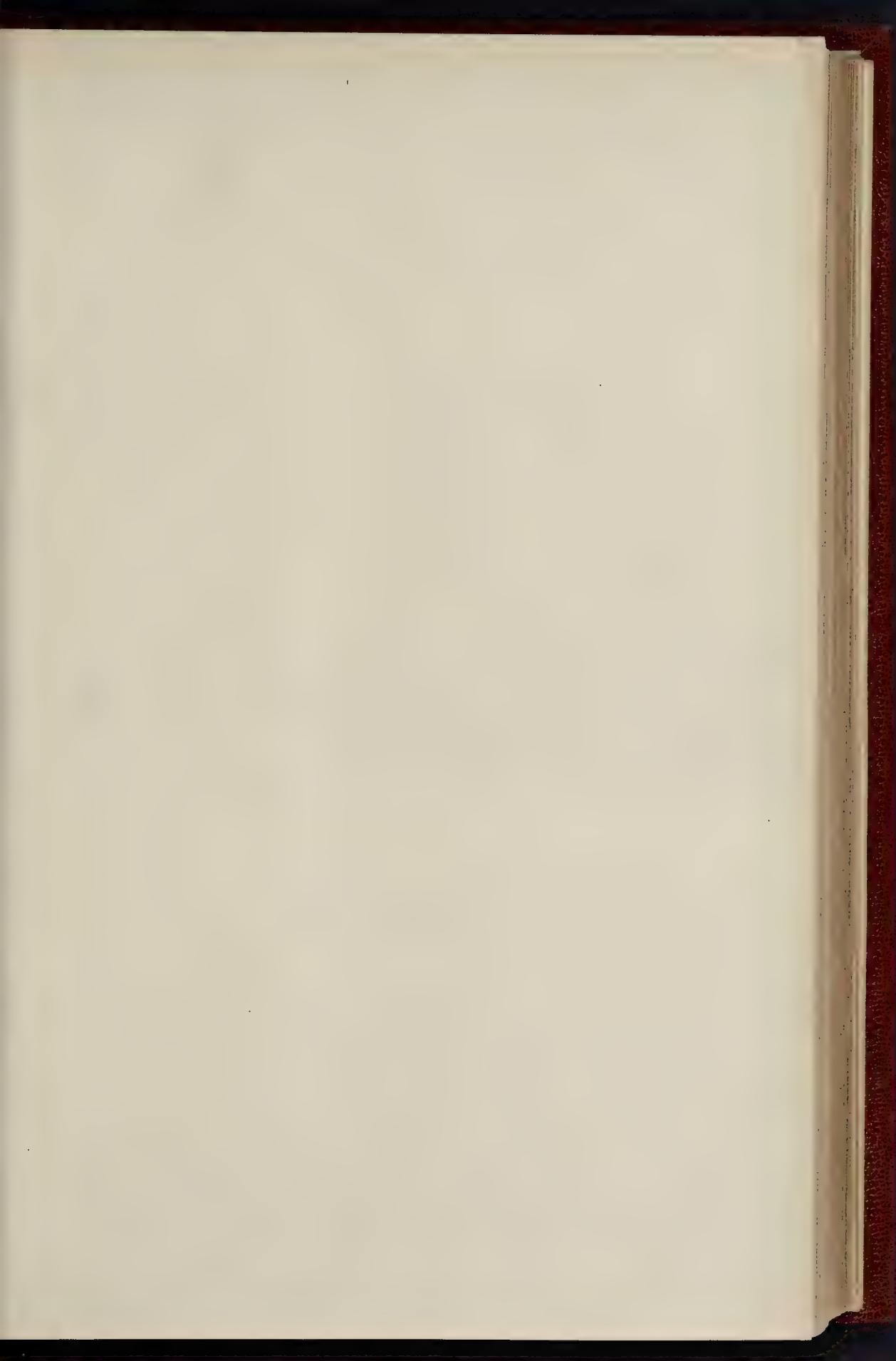


DECORATION IN BILLIARD-ROOM, WORTLEY HALL.—By MR. E. J. PONYSTER, R.A.





THE CITY AND GUILDS OF LONDON TECHNICAL INSTITUTE -MR. A. WATKIN, R.A., ARCHT.





THE ACADEMY OF SCIENCES, ATHENS. — DESIGN

THE ACADEMY OF SCIENCES, ATHENS.

WE issue with this week's *Builder* a view of the Academy of Sciences, Athens, the plans for which were designed by Oberbanrath Ritter von Hansen as early as 1859. Professor E. Ziller, of Athens, has been the superintending architect from 1861 to the present day. The building has been erected at the expense of a wealthy Greek, Baron von Sina, of Vienna, the total cost being 2,500,000 drachmas (100,000*l.*). After his death, the funds for its completion were supplied by his wife.

The substructure of the buildings is of Piræus stone, as used for ancient Greek edifices; the upper part is of Pentelic marble, and erected in the same style as the buildings of the Acropolis. The pediment of the centre building represents the Birth of Minerva. The column to the right of the centre portion bears the figure of that goddess, that to the left Apollo. The eight pediments of the wings contain scenes from the life of Minerva. The statues of Plato and Socrates will flank the geometrical stairs.

The aula is located in the principal story, and contains a series of eight large frescoes, representing the myth of Prometheus, as well as the bronze statue of the founder of the Academy, Baron von Sina. In the same story are also the library, lecture-rooms, &c. The basement contains offices. The colouring both of the interior and exterior is in imitation of that of the buildings of the Acropolis. The ground colour is gold; red, blue, brown, green, and black being subordinated to the principal colour.

The erection in modern Athens of a building for the pursuit of modern studies, in the style of the glorious past age of Greece, is an event in architecture that one cannot but regard with interest, whatever view may be taken by different people as to the advisability of thus interposing a modern revival of Greek architecture in direct competition with the original monuments. The experiment may be thought to be a hazardous one; but for our part we cannot help feeling a sympathy with the idea that on such classic soil an architect must feel a kind of necessity to be a Greek, and to do his best to touch even the hem of the garment, if one may so speak, of the architects of the Parthenon and the Erechtheion. Their shades, however,

would hardly have approved the use of the large solitary columns with Ionic capitals, as pedestals for statues: a modern mistake in the use of the column which has been criticised often enough, and which we must regret to see repeated on Attic soil. The main grouping of the building is effective in its contrast between the colonnade and the masses of solid wall in the wings and the rusticated stylobate.

THE NEW THEATRE AT NICE.

(See *Illustration* in present Number.)

THE town of Nice has lost no time in seeking to repair the disastrous destruction of its theatre by fire. As the reconstruction of the theatre is not a private enterprise, but a municipal undertaking, the work was necessarily hampered by many formalities. Each detail had to be discussed and approved by the Municipal Council, and whatever extraneous advisers they chose to call in. Then, when all parties agreed to accept the plan and scheme of M. Anne, the town architect, every detail had to be forwarded to Paris and there submitted to the searching criticism of the Conseil Supérieur d'Architecture. This was done last June, but there were some details that did not give satisfaction. M. Garnier, the architect of the Paris Opera, objected to a sun-dial to which the Nicolis had been particularly attached. There was something quaint about this sun-dial. It had been affixed to the back of the old theatre facing the sea and the south, and strollers on the Promenade du Midi could, during the winter, see what was the honour by means of this sun-dial. It was an effective way of demonstrating to the visitor the special privileges of the Nice climate, and enabled him to realise the exceptional amount of sunshine enjoyed during winter on the sea-beach. These were considerations which, however, failed to produce any effect in Paris. M. Anne wisely refrained from any semblance of resistance. On the contrary, calling all his assistance to his aid, they at once altered and re-made all the drawings. The sun-dial was consigned to limbo, and all M. Garnier's hints and suggestions carefully carried out. This was done without a moment's delay. In a few days the new plans were ready and on reaching Paris were



OBERBAURATH RITTER VON HANSEN, VIENNA, ARCHITECT.

was approved. The vote of the Conseil Supérieur d'Architecture was given on the 26th of June, and on the following day M. Garnier wrote a complimentary letter to M. Anne, felicitating him on his success, and stating that his project was "absolument bien!" The works have now been commenced, and hopes are entertained that they will be completed in time to open the theatre on the 1st of January, 1885.

The estimated cost, 56,000*l.*, is generally thought insufficient. It will probably not fall short of 2,000,000 francs, or 80,000*l.*; and, in Paris, an allowance was made for "the cost of direction"; a fact which is looked upon as at once gratifying and complimentary.

The new theatre will contain three rows of boxes, with an amphitheatre gallery above them. There will be seats for 1,500 persons without dressing, whereas the old theatre only contained 900 people, and, needless to say, the very greatest precautions have been taken to prevent a recurrence of the fatal catastrophe which ended the existence of the previous theatre. The gallery, the stalls, the boxes, in fact every part of the house has its own entrance, and there is also a special covered way reserved exclusively for persons who have carriages. In thus diverting the stream of traffic, anything like a crush, it is thought, will be avoided. But improved means of escape are not considered a sufficient precaution. The entire structure will be fire-proof; that is to say, if it is indeed possible to make anything absolutely fire-proof. Nor are the authorities satisfied with measures of the strictest surveillance. The other theatres at Nice are actually placed in a room to be used. Before any new play, necessitating the employment of scenery, is performed, the Town Engineer, M. Bérard, personally inspects every detail, and, with a lamp, tries to ignite the scenery. It is after a practical demonstration, such as this, that the authorities give sanction, and the public are admitted to see the play. Perhaps if the Chamberlain in England were to organise a similar service, it would materially add to the usefulness of his office.

The ordinary calcareous sulphate of limestone that abounds throughout the neighbourhood will naturally be taken for the great bulk of the masonry

work. But few bricks are required. For the lower portions of the building, however, extensive use will be made of the very remarkably hard stone from Turbia, which takes a polish like marble and remains intact through centuries. It was with this stone that Augustus built the tower on the heights of Turbia to celebrate his victory over the Gauls. And this fine old monument was only destroyed in part by the hand of man. Time had left it intact, and its remains are still the object of admiration to all travellers on the Corniche road and the visitor to Monte Carlo. The delicate stone of Montpaon, a kind of freestone, will be employed where sculptural decorations are inserted. It is found principally in the Vaucluse and the neighbourhood of Arles. The columns will be of Verona marble, which has a yellow and reddish tint that matches admirably with the stones we have described. This same marble has been displayed to great advantage at the entrance of the new palatial office just opened at Nice by the Crédit Lyonnais. Finally we should mention that the ironwork, of which a large quantity will be required, because it is not inflammable, will be entirely of French manufacture. This is a fact of some importance, as the iron bought to build the jetty came from Belgium, and the same may be said with respect to the iron used for the new Casino, now also in course of construction. Nothing as yet has been decided concerning the internal decoration of the theatre, nor have any artists been selected to paint the frescoes. There is still time to think about such matters.

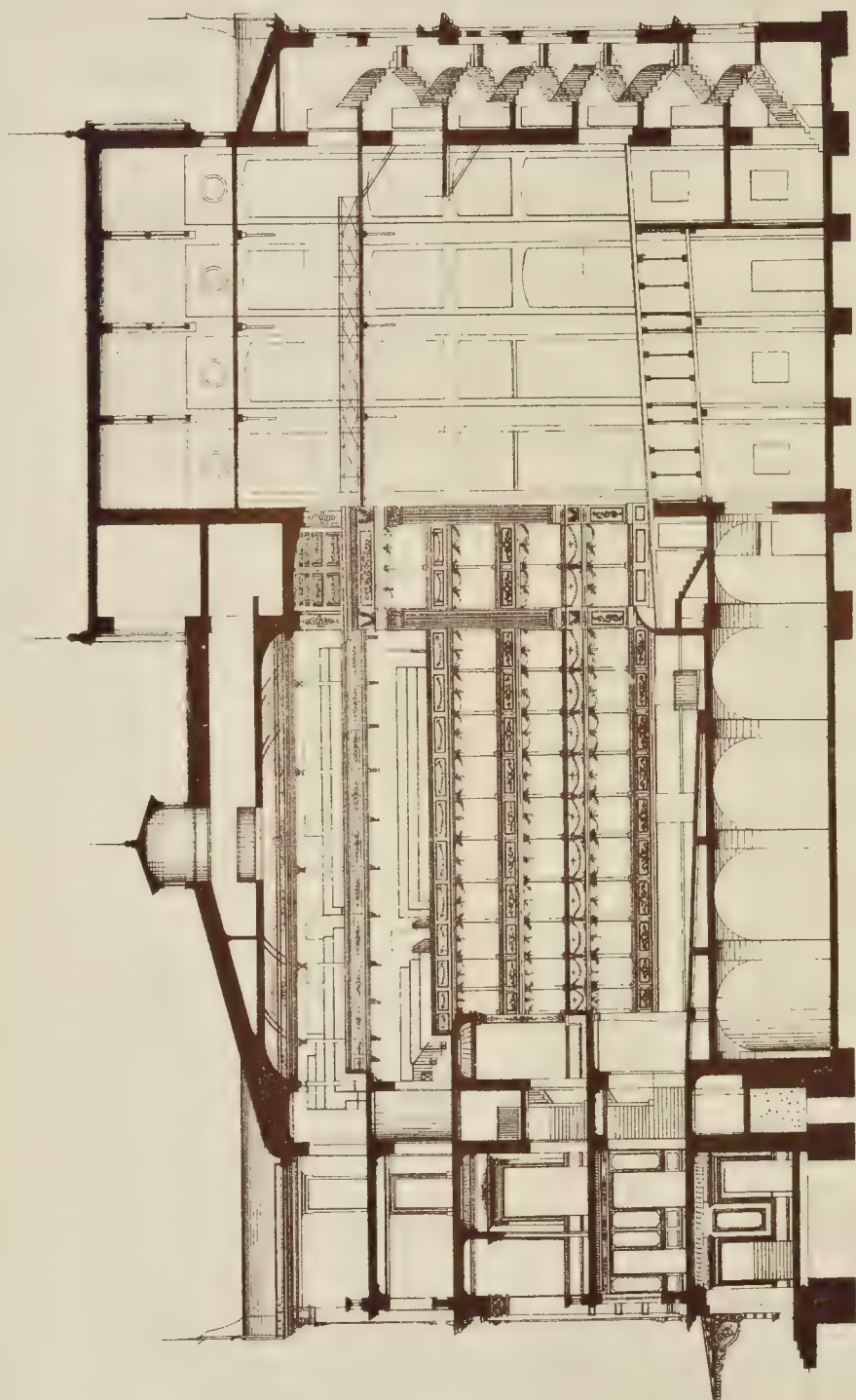
One very important point, however, has been neglected. This is the question of ventilation. There is no real plan, no scientific scheme, to give a proper supply of pure air. Numerous openings will be made on all sides, and doubtless a very good through draught could be created. But no one will endure a through draught, particularly the colony of invalids and delicate persons who frequent Nice. In such a town, and for a special public of this description, it was particularly necessary to contrive some means of gradual, imperceptible, but thorough ventilation. That this can be done, and done fairly well, has been demonstrated on more than one occasion; and notably at the Grand Theatre of Geneva. But it is not yet too late to make up for this deficiency.

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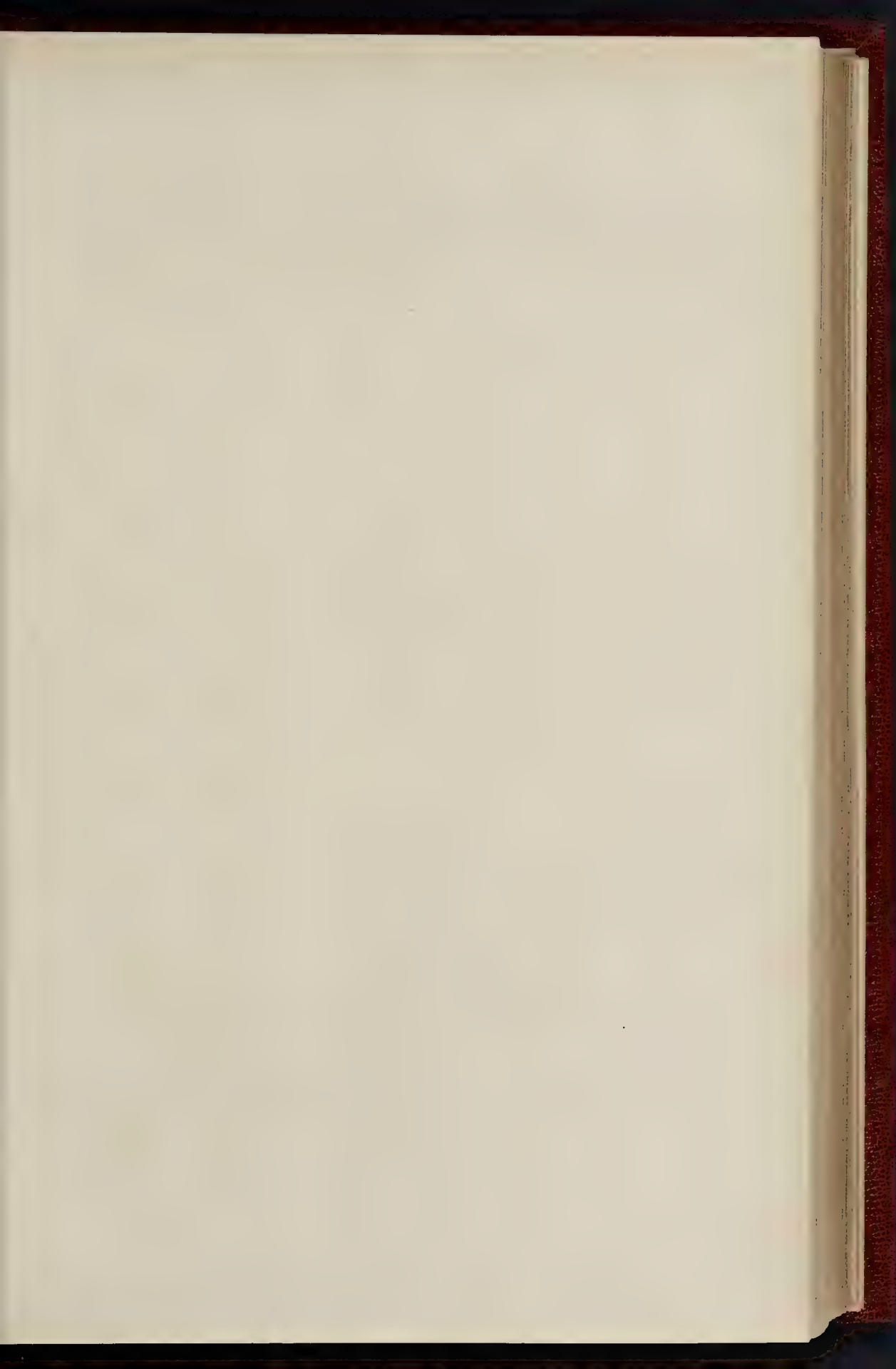
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THE NEW THEATRE, NICE — M. AUSE, ARCHITECT.
SECTION.



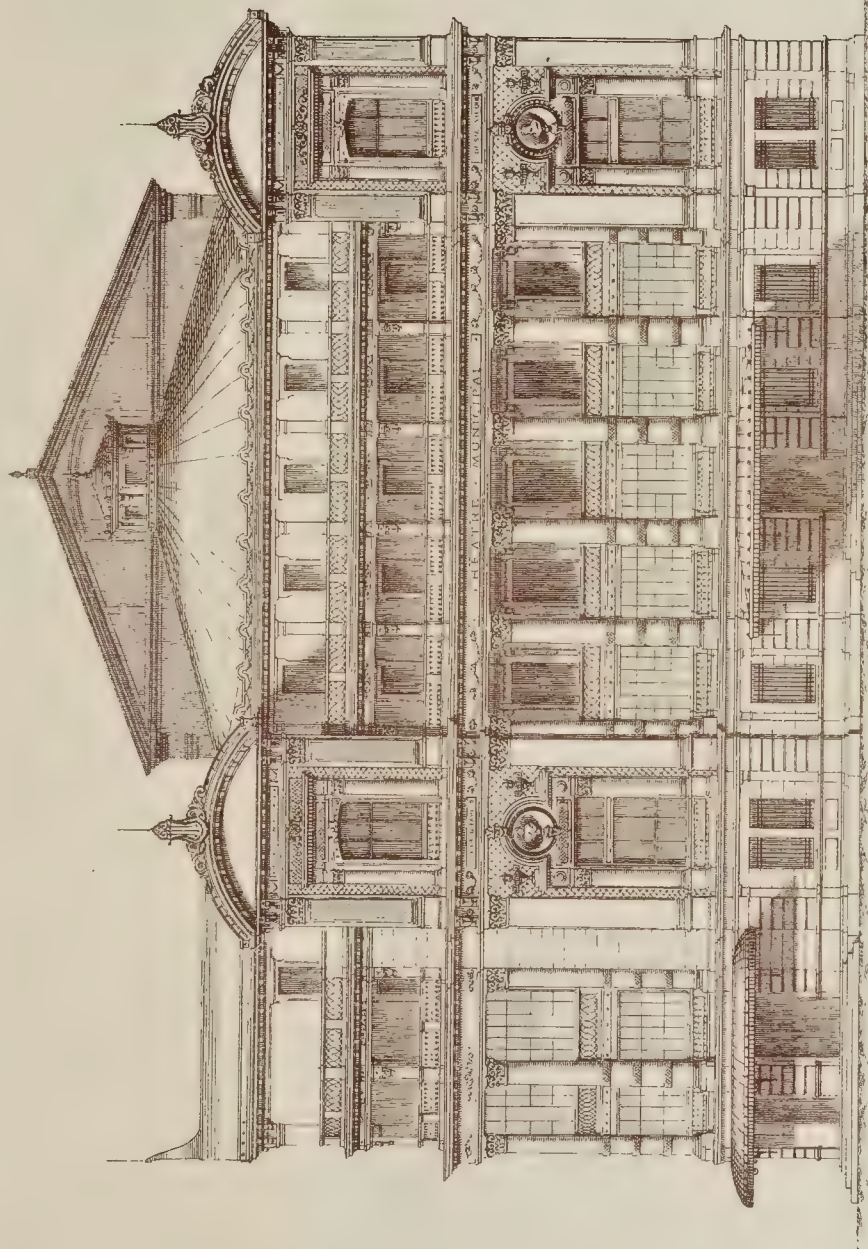


MODERN STREET ARCHITECTURE, BERLIN.

IN THE REGENTEN-STRASSE.



MODERN STREET ARCHITECTURE, BERLIN
IN THE FRIEDERICH-WILHELM-STRASSE.

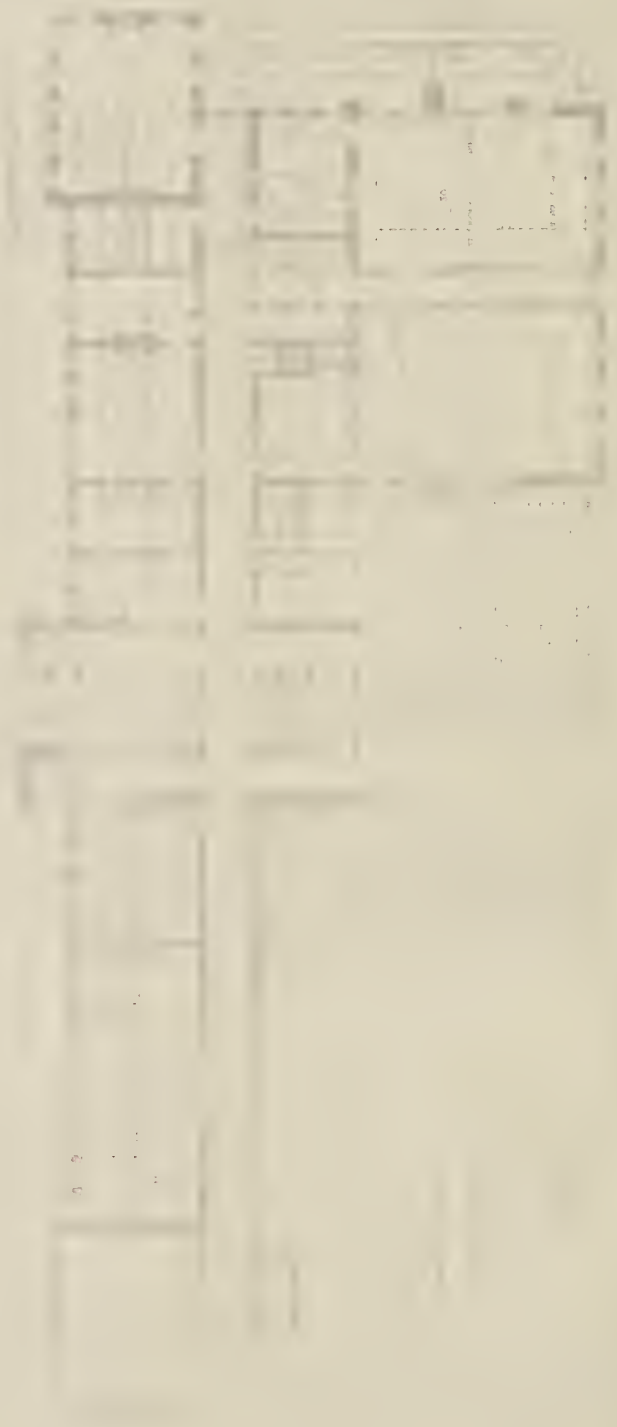


THE NEW THEATRE, NICE.—M. AUNE, ARCHITECT.
ELEVATION

Fig. 177.

Plan of the Temple of Isis at Philae.

The Temple of Isis at Philae is a small temple of the Ptolemaic period.

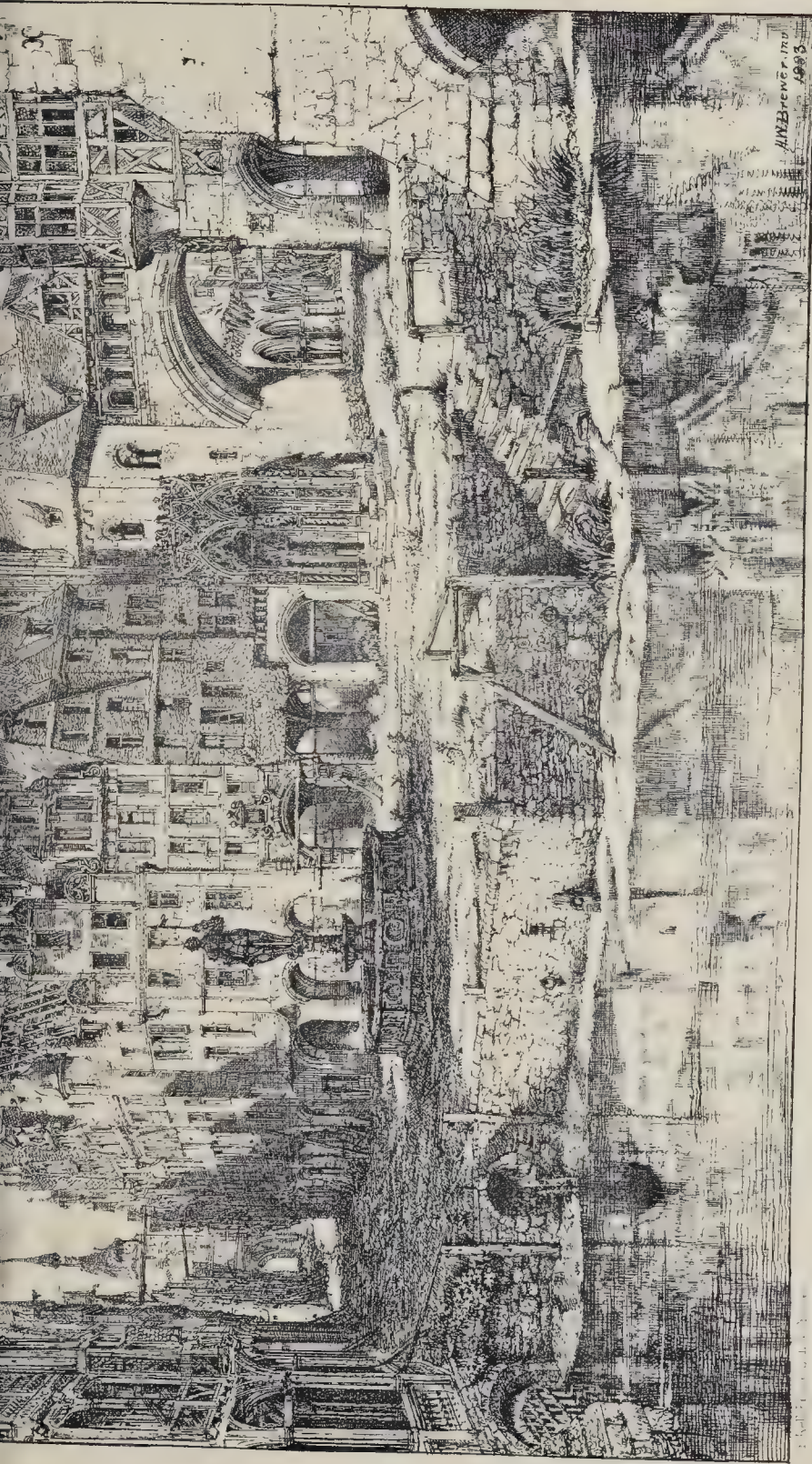


It is a very common mistake to suppose that the only way to get the most out of a book is to read it straight through from beginning to end. This is not necessarily the best method, especially if the book is long or if the subject is unfamiliar.

One of the best ways to get the most out of a book is to read it in a systematic way. This means that you should read the book in a logical order, starting with the beginning and ending with the end. This will help you to understand the book better and to see how the different parts of the book are related to each other.

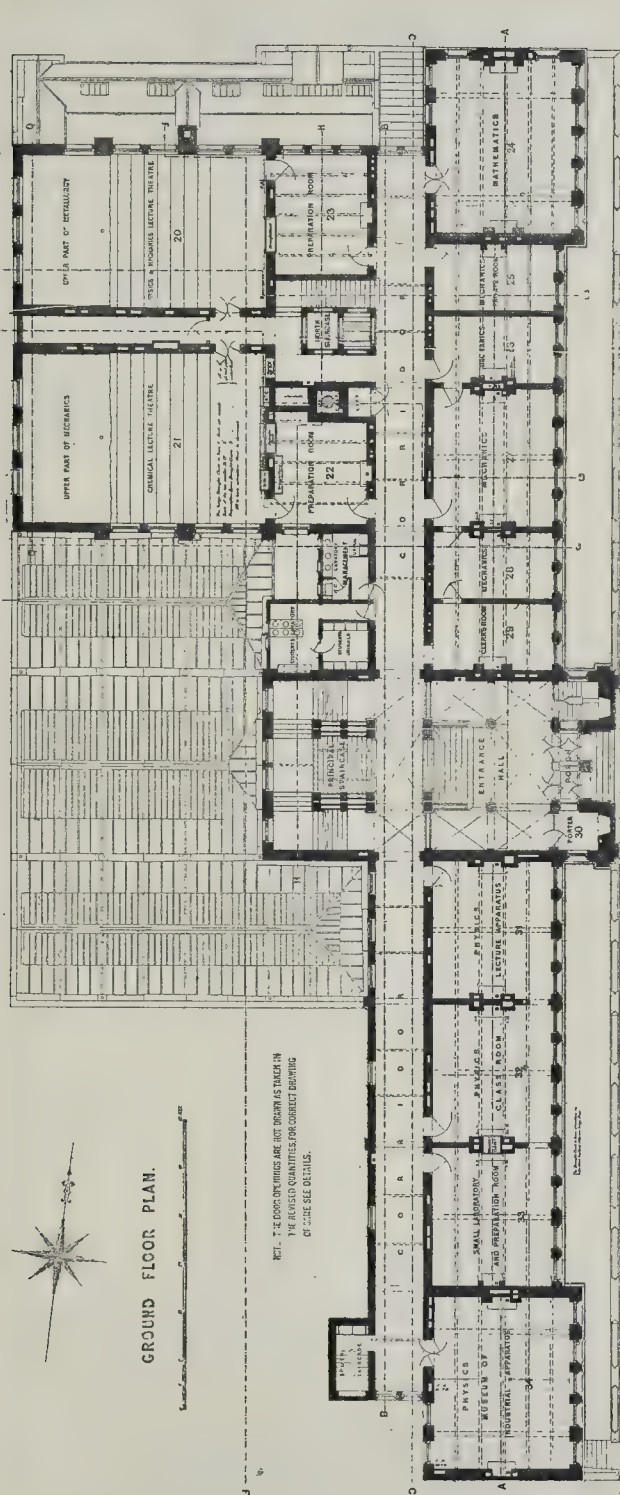
THE BUILDER, JANUARY 5 1894





"Deserted"

"MY TABERNACLE IS SPOILED, AND ALL MY CORDS ARE BROKEN: MY CHILDREN ARE GONE FORTH OF ME, AND THEY ARE NOT."



THE CENTRAL TECHNICAL COLLEGE, SOUTH KENSINGTON.

THE City and Guilds of London Institute for the Advancement of Technical Education is to be congratulated on the near completion of its future headquarters. The foundation "column" was laid by His Royal Highness the Prince of Wales on the 18th July, 1881, the foundations having been put in by Messrs. Munday.

For 300 ft. the building fronts the Exhibition-road, on the opposite side to the South Kensington Museum, and closely adjoining the Natural History Museum designed by the same architect, Mr. Alfred Waterhouse, A.R.A. of London. The exterior is of a semi-classic character, freely treated, of red brick with red terra-cotta dressings, and derives additional interest from the arms of the principal manufacturing towns in the United Kingdom, which are displayed in strong relief upon its front. These arms have been modelled by Mr. J. A. Gamble. In the central gable, over the entrance, is a Gillett clock striking quarters three bells, and indicating the hours on a gold mosaic face.

Internally the building is, for the most part, five stories in height. In the basement are mechanical workshops, three very large ones at the back being top-lighted. The entrance-hall is in the centre of the building, and the visitor ascends from thence by a few steps to the level of the great corridor on the ground-floor, which stretches from one end of the building to the other. Across the corridor is the main staircase, double arcaded between the flights to the top of the building, the piers, balustrades, &c., being of Burmantofts terra-cotta of a deep golden colour. Mechanical class-rooms, Physical class-rooms, a museum for industrial apparatus, and a room for the teaching of mathematics, are located on these floors. There are also at the back of the building two large lecture-theatres, lighted principally from the sides; one being for Chemistry and the other for Physics and Mechanics.

On the first-floor, over the entrance, is a large reading-room and library, with experiment-rooms and class-rooms on either side of it. The offices for the administration are towards the north-end of the building, terminating in the council chamber, a handsome apartment, on the walls of which it is proposed to emblazon the arms of all the livery companies. On the second-floor an art museum occupies the place of honour in the centre of the building, with class-rooms and lecture-rooms on each hand. The principal chemical class-rooms are over the large lecture theatres. On the third floor, above the art museum, is a large room, 67 ft. by 35 ft., with a fine semicircular roof, for museum purposes. At one extremity of the building is a lofty refreshment-room, for students and others engaged in the building, with kitchen, larders, &c., adjoining. At the opposite end is a large special laboratory, adjacent to the general chemical laboratories, which are over the chemical class-rooms. The corridors are, for the most part, paved with Stuart's granolithic material, but the entrance-hall and principal corridors on the ground and first-floors have marble mosaic pavements. There are dinner and coal lifts at one end of the building, and a large steam lift for bulky and weighty articles, such as machinery, at the other.

Internally the finishings are principally of deal painted, the fireplaces and chimney-pieces being formed of glazed brick and stone. The heating and ventilating has been entrusted to Messrs. J. L. Bacon & Co., who have elaborated a scheme by means of which 700 cubic feet of fresh warm air per hour will be delivered to each person. The fresh air will be forced into the building by a powerful fan, and passing over steam-heating surfaces arranged along the back corridors, will then be carried by vertical flues to the various rooms, the amount of air and heat being regulated by valves. There are also special extraction flues both from the rooms and laboratories. The ironwork has been carried out by Messrs. W. H. Lindsay & Co. Mr. Henry Lovatt, of Wolverhampton, is the contractor, and Mr. T. Streeter the clerk of works.

To the general architectural style of the building we have referred more especially in our first article in this week's issue, on "English Architecture" at the present date.

"REFORM AT THE INSTITUTE OF ARCHITECTS."

SIR,—Your obliging correspondent, Professor Kerr, should be possessed, above all other things, of a retentive memory. Had he recalled the purport of some of his many communications to you on the "reform" of the Institute of British Architects, he would never have penned that unfortunate epistle which was printed in your last week's issue, and to which I now solicit space for a reply.

Amidst the mass of petty questions which the Professor puts to Mr. Barry and myself, there is one dominant query: Whether the promises offered by the modifications of 1870-77 have been realised, or what is really found to be the advantage derived from them?

The present system came into force at the annual election of the Council in May, 1877, when Mr. Charles Barry was re-elected president, when three vice-presidents were elected and placed in order of seniority, with fifteen ordinary members, and two secretaries, one honorary and the other paid. Since then a change has occurred annually. In 1878 only fourteen out of the original fifteen ordinary members of Council remained; in 1881 only ten; at the present moment only seven remain, as may be seen by a reference to the first page of the List of Members. Of those elected vice-presidents in 1877, not one remained in 1880; of those elected in 1880, only one remained in 1883. The Council, assisted by the past-presidents and the past-vice-presidents, did contain, in 1877, the foremost men of the profession; but, alas, the *Avengeur* has done his work prematurely! Since that fatal year, Scott, E. Barry, Ferrey, Cookerell, T. H. Wyatt, Decimus Burton, Salvin, Mocatta, and Street have died. Mr. Pearson and Mr. Villiamy have both retired from the Council on account of inability to attend to the work; but nevertheless its condition during the last six years, compared with what it was during the six years preceding 1877, has been one of astonishing and uninterrupted prosperity.

In 1876, the year Mr. Barry was first elected president, the Institute numbered 600 subscribing members: its total income for that year (exclusive of entrance-fees, which were then spent as income) was 1,545*l.*; its expenditure was 1,730*l.*, and, during the three preceding years, it had sold more than 500*l.* stock to meet current expenses. In 1879, when Mr. Barry left office, the Institute numbered 780 subscribing members: its total income for that year (exclusive of entrance-fees, which were then first ordered to be invested) was 2,529*l.*; its expenditure was 2,351*l.*. Its capital in 1876 was 4,522*l.*; in 1879 it was 5,110*l.*; and, though more than 2,000*l.* were sold out in 1880 to pay for the building alterations, its capital at the close of 1882 was 4,830*l.*. In the course of the last ten years the number of subscribing members has doubled, for in 1874 they amounted to 550, and in 1883 to 1,094. In the course of five years the circulation of the Institute publications increased from 750, in 1877, to 1,500, in the year 1882.

When I succeeded to the chair, the ordinary meetings, convened for the purpose, principally, of reading or discussing a paper on some subject of scientific, literary, or artistic interest, were occupied for three quarters of an hour, or even more (rarely less than half an hour) in what was called preliminary, or, as the Professor would term it, "parochial" business. The ballot for new members, the announcement of donations, votes of thanks, and desultory conversation on any topic that a fluent member might care to introduce, often ensued, so that men like my friend the late Sir William Siemens have been known to quit the meeting-room before the paper they had specially come to hear was commenced. This was remedied by the introduction of the present custom of devoting four meetings a session to such business, and thereby securing to the general body fixed opportunities for raising a discussion on professional matters and the affairs of the Institute generally. During my term of office the foreign members and societies, and the members of the Institute in India, the Colonies, and abroad, were first provided, post-free, with copies of the "Proceedings" and the sessional papers; and, at the present moment, the publications are regularly issued to some 1,500 people all over the world, the consequence of which has been a correspondence or exchange wider in its bounds, and more fruitful in results, than

was ever the case in previous years; or at least since Professor Donaldson, who personally knew most of the great architects of Europe,—the last of the giants having just died in Lesseur,—devoted his almost entire attention to the development of the Institute. In Mr. Barry's time, and mine, the intercourse between the non-metropolitan architects and their London colleagues was rendered more easy and general; and at the present moment there really exists a means of organising, in the interests of education, for instance, a professional movement throughout the British islands, if such a course were necessary or desirable. Finally, it was the present paid secretary who placed the finance accounts of the Institute on a better footing than had existed before, and during the last few years the Examination for Associateship has become a fact.

Professor Kerr says, in one part of his letter, that he "can recall the gracious way in which the nomination of new members of Council was so contrived as to bring every man into notice in his turn," thereby affording him a mark of recognition which was "duly beneficial to him in business"; and he adds, in another part, that "the mere selection of office-holders has never been a bone of contention." I dispute the accuracy of both these statements, and I repudiate the kind of argument of which the former furnishes the premises. At periods anterior to 1877 it was often difficult to persuade the best men to sit on the Council, and difficult to find any men to attend to the duties of the managing body even between half-past six and eight o'clock in the evening. Few knew this better than Professor Kerr himself. In 1875 he made an attack on the late paid secretary's outposts, but left the meeting-room of the Institute before the division, which recorded a minority of one on the Professor's side, was taken; and he had previously commenced operations by a letter he sent to the *Builder*, published on the 1st of May, 1875. He moved a resolution in 1869 to the effect that a committee should be appointed to inquire into the operations of the Institute and propose means for increasing their efficiency, and the resolution passed; but with what results? As for the geniality, interest, and attractiveness of the meetings of that time, I can only state that when, in January, 1869, the Professor read a paper on "The Architecturesque," there were about thirty members present. It was the night that poor Ashpitel's death was announced, and Sir Digby Wyatt was one of the audience, with Mr. Charles Barry in the chair. I do not remember that the proceedings were either attractive or interesting, or that the geniality of the Professor and his friends was greater at that period than it has since been. In 1862 the Professor headed a requisition for a special meeting, and in a good cause, but at the meeting itself several members who had signed the paper denied any intention of hostility to the Council, whose action was ultimately approved. Four years earlier, if my readers will kindly turn to the *Builder* of the 8th of May, 1858 (page 311), they will find a signed communication, in which the management of the Institute under Earl de Grey is denounced in unmeasured language by a certain "Robert Kerr," who records the existence at that period of "a restrained and corrupted house-list, close-vestry system," which was quite enough, he wrote, to account for the apathy then displayed by the members in the affairs of the Institute, and he wound up with the appeal,—*"Don't make a desert and call it peace."* Sir, the "desert," to which Professor Kerr referred in 1858 was the work of Nelson and Digby Wyatt, and of Professor Donaldson, the very men whose "charming activity and enterprise" he now recalls,—when Plancus was Consul, and the author of the "Newleaf Discourses" scolded the elders. In this matter of unconsidered opposition, the Professor's action has invariably been of a piece. I have never known any "reform" suggested by him to take a useful or an effective shape except one, which arose from a delightful creation of the Professor's brain familiar to the readers of "Newleafs." In the debating assembly where those discourses took place, there was a functionary of parochial proportions whose attire was "green and gold," and who was of stature sufficient to remove from the room any gentleman whose personal opinions differed from those of the chairman and his supporters. After 1877 an abridgment of such a personage was conspicuous at the door of the Institute,

but his splendour, which endured for a brief period only, faded and ultimately collapsed, whether from the sallies of juvenescence within the walls of the Institute, or the malice of a neighbouring cab-rank, has since remained a matter of conjecture.

But away with these trivialities. Let me, sir, on the first day of this year of grace, ask the profession of British architects to look important matters, vital to its present and future interests, full in the face. Six months hence the Institute will have accomplished fifty years of existence, during which this country has made great and undoubted progress in the higher arts. The condition of ecclesiastical and domestic architecture has steadily developed and improved. But unless Rumour is more than usually deceptive,—unless the intermittent agitation that is now felt and heard means nothing,—the initiation and design, both as to plan and construction, of public and historical edifices, has not advanced, but has rather receded, since the days of Sir William Chambers, John Nash, and Sir James Pennethorne. The foolish,—I had almost written criminal,—disregard of Continental example has gradually brought this country to its present condition in the matter of the artistic control of public buildings. The First Commissioner of Works, by an anomalous compromise between the principles of Free Trade and Protection, is really at the head of a huge Architect's Office, engaged in erecting all over the kingdom a number of public edifices, and entrusted with the alteration of royal palaces, Government offices, the British Museum, and similar buildings,—and openly competing, by word and deed, with professional architects. For the moment all the youth and promise of the profession is deeply engaged in a speculative competition, invited by the Government, the first stage of which is to be secretly adjudicated on, under the direction of the chief of this very Office, who will thus be judge and party in an identical cause, and who will appoint his own jury. In the second stage, ten professional architects will, for a consideration, present to H.M. Office of Works ten carefully-finished and complete designs for a large building, in the hope that "at least one architect" among the jury will at least recommend one architect among the ten competitors to superintend the execution of the work. Should events prove unfavourable, as they have more than once turned out before, there is only one body in the kingdom which can help British Architects, and that is the Royal Institute. The Royal Academy, even if it had the will, cannot help either sculptors or architects. At the present time it is a body of painters. Out of forty-one Academicians, only two are architects, neither of whom has taken the post hereditary to our calling, of treasurer, who, for the first time since the foundation, is a painter. Of the thirty Associates, only two are architects. Of the Academician-professors, only one chair, that of Painting, is filled; the chairs of Sculpture and Architecture, one unoccupied for three, the other for two, years, are both vacant. Only the Royal Institute of British Architects can help the profession, and, aided by an enlightened professional press, it can do much. I would say, therefore, to the architects all over the country,—Organise, Organise, but not against each other. Organise, gentlemen and colleagues, for the general good, and in the common defence.

JOHN WHITCHORD,
Past President of the Royal Institute of
British Architects.
January 1st, 1884.

SIR,—In your current number you allude to the changes to be proposed at the Institute on Monday next. Would you allow me to inform your readers that the suggestion I have to offer is that of the fifteen elected members of Council, not more than twelve should be eligible for re-election, so that on the list of votes any old members in excess of twelve would be passed over in favour of new members. This, while it avoids "the enforced retirement of members of Council annually by rotation," will place on that body each year three members who have not served during the previous year.

LACY W. RIDGE.

A Submerged Forest is reported to have been found during excavations for building purposes in Washington. The stratum was found to underlie the quaternary gravels of the district.

THE HOMES OF THE POOR.

The author of the Artisans' Dwelling Act of 1875 (Sir R. Cross) contributes to the *Nineteenth Century* for January an article on "The Homes of the Poor," in which he expresses gratification that Lord Salisbury's recent contribution to the *National Review* (commented upon in the last volume of the *Builder*, p. 577) has roused general attention to this important subject. The questions to be solved, he observes, are these:—(1) How to prevent the further growth of the evil of unsanitary dwellings; (2) how to insure that properly built houses are kept in a sanitary condition; (3) how to get rid of old slums; and (4) how to do all this without pauperising and so demoralising the poorer classes. On the first of these heads he suggests increase of powers to the metropolitan authorities; and, on the second, he observes that:—

"The principle is clear that as an owner is not allowed to build unsanitary houses, and is held responsible for their being properly built, so also has Parliament a right to call upon him if he wishes to let houses as human habitations, to see that they are maintained in a fit state for habitation. The existing law seems clear enough on this point, and it is at present more a matter for administration than legislation. What is required is more constant and more persistent administration of the existing laws by the local authorities, urged on as they must be by the several departments who, in their turn, will require all the assistance that can be given by a wholesome public opinion."

With regard to old slums, Sir R. Cross thinks the Acts of 1868 and 1875 should have a fair trial before anything further is attempted in the way of legislation. Lastly, as to the question of building houses which should be commercially remunerative, and the rents of which should not pauperise the poor classes, Sir Richard observes:—

"It may seem hard to say it, but taking the normal condition of things in towns and cities, without danger of great social evils, the matter must be left to the ordinary rule of supply and demand, to the regular administration of the Poor Laws, to the assistance of such loving hearts as that of Miss Octavia Hill, and to the opportunities offered by the Peabody Trustees and the several industrial dwelling companies, &c.; but the matter may, to a certain extent, be different in those cases in which you are not dealing with such a normal condition of things, but have to grapple with the accumulated evils of many generations. Then, unless you provide some temporary relief, by pulling down and by turning out you will create greater evils than those which you propose to cure. You must not force on overcrowding; you must not drive to the workhouse; you cannot leave these people in the streets. Nothing remains but that, for a time at all events, some house accommodation for families, something like the Glasgow lodging-places for single people, should be temporarily provided. I say temporarily, for no one would wish such places to continue longer than is necessary for the people themselves to find their own more suitable accommodation elsewhere, or, what is far better, to be educated out of them. The charitably disposed may here step in, and it is only in the very last resource that the local authorities should be called upon to take any such steps, but they may be called upon, at all events, to render every assistance in their power to induce others to step in."

THE DWELLINGS OF THE LONDON POOR.

On the 28th ult. a meeting of the Central Committee formed at the recent conference at the Mansion House on the subject of the condition of dwellings of the London poor was held in the Venetian Parlour. In the unavoidable absence of the Lord Mayor, Mr. Alderman Cotton, M.P., presided.

It was unanimously determined that with the view of giving practical effect to the wishes of the recent conference a general council should be formed, of which the Lord Mayor should be the president and the treasurer, the Archbishop of Canterbury, the Marquis of Salisbury, and the Earl of Shaftesbury, vice-presidents; Mr. John Simon, C.B., Dr. Sedgwick Saunders, and Mr. Shirley F. Murphy, honorary medical officers; Messrs. Freshfields and Williams, honorary solicitors; and Mr. John Hamer, honorary secretary, and consisting of a large number of ladies and gentlemen interested in the question. The object of the committee would be to assist the authorities to put in force more effectively and generally the existing Acts which bear upon the sanitary condition of tenement houses, and to promote the construction of improved dwellings, where necessary, at rentals within the reach of labourers and others, it being an important ele-

ment in all such improved dwellings that proper arrangements be made for careful supervision and control. The committee would also take special cognisance of the necessities for further legislation as they arose, and take steps for the furtherance of the same. To carry out those objects the meeting established two executive committees,—one to examine present legislative Acts affecting the condition of the poor, to watch Parliamentary action in connexion with the same, and to take such steps as might be necessary from time to time to promote the objects of the committee; and the other to establish local committees throughout the metropolis, and to assist the sanitary and other authorities in the performance of all duties relating to the improvement of the moral and physical welfare of the poor.

These committees having been nominated, it was further determined to establish a fund for defraying the necessary expenses in connexion with the work, to be called "the Mansion-house Fund for Improving the Condition of the Dwellings of the London Poor," and it was intimated that donations, of which a good list was made in the room, might be sent at once to the Lord Mayor. It was also determined to memorialise the Home Secretary and the President of the Local Government Board on the subject, the points noted being the expediency of such amendment in the law as would prevent the burden of sanitary improvements and the cost of improving the dwellings of the poor becoming a charge on local rates or on any one class of the community; the necessity of more efficient execution of sanitary Acts, and the formation of sanitary aid committees, with a view to obtaining voluntary assistance in carrying out the law; the making many of the permissive powers compulsory, especially in relation to houses let in tenements; the relieving of sanitary officers of the difficulties attaching to their office through the influence of owners of insanitary property on local boards; the increasing of facilities of boards to acquire all interests in property not in a sanitary state at such a cost to the rates as would enable the sites of such property to be sold without loss; the granting of Government loans on easier terms; and the providing for the compensation and more immediate housing of ejected tenants.

AN IMPROVED FORM OF SILO.

WITHIN the last two or three years the value of ensilage as food for cattle and horses has been brought prominently before the agriculturists of this country. A silo is merely a pit sunk in the ground and lined with concrete or other material so as to render it air and water tight; or it may take the form of a large bin or receptacle enclosed by walls rising above the ground level. Into this receptacle grass or any other green crop is thrown as soon as cut, and covered with planks laid edge to edge and weighted down with stones, bricks, barrels of earth, or other heavy substances. The object of this weighting is, of course, to compress the crop and to drive out the air, so that fermentation shall not be set up, for if this occur the ensilage is rendered useless. Obviously this method of weighting down the covering of planks on top of the crop is very primitive, troublesome, and laborious, for every time the planking has to be removed, either for adding to or taking from the contents of the silo, the heavy materials with which it is weighted have to be taken off by hand labour, and this is a work of time and expense. It has been sought to get the required pressure on the platform by means of levers, screw presses, and other contrivances, but hitherto, so far as we know, without success, the extent of the area to be compressed rendering it difficult, if not impossible, to get in this way the pressure required (from 100 lb. to 200 lb. per superficial foot), distributed evenly over the whole of the surface, without complicated and costly overhead arrangements, the expense of which would probably only be equalled by their cumbrousness and liability to get out of order. Seeing that ensilage is likely to claim the attention of farmers generally, not only from its value as a cattle-food, but because silos afford a ready means for saving green crops, it is satisfactory to note that a simple means of compressing the ensilage has been devised by Mr. Thomas Potter, of Alresford, Hants, who is already known to many of our readers who have studied the subject of concrete building, as the inventor of what are

called "Potter's slabs" for facing concrete walls. Walls built in this way are admirably adapted for silos, whether sunk or above the ground. However, into these or any other walls, Mr. Potter builds wrought-iron channel standards, which have strong iron fangs riveted to them every 6 in. apart, these fangs serving as the points of resistance to the claw of a specially-constructed portable hydraulic jack. When the covering-planks (the best dimensions for which are 7 in. by 3 in.) are in place, transverse timbers, 11 in. by 7 in., are placed across them, with their ends abutting on the channel iron standards. The hydraulic jack forces down the ends of these transverse timbers one by one, and they are then wedged or keyed down to the required position. Of course the pressure can be increased from time to time (as required by the shrinkage of the crop) by merely applying the jack to each transverse timber for a moment. When it is desired to remove the planking, the jack is as readily brought into play so as to release the wedges. We understand that three silos on this principle have been built on Lord Ashburton's estate at Alresford, and that these have been so successful that two more are to be built. Mr. Potter says that the best width for silos is 11 ft.; they may be any length.

Messrs. F. W. Reynolds & Co., of Acorn Works, Edward-street, Blackfriars-road, are the makers of the channel irons and jacks in question, and they have on their premises a silo fitted up with them. While there, we had an opportunity of seeing another useful invention, viz., Rainbow's Patent Steam Water-raiser, which, with a pressure of steam of about 1 lb. per square inch per foot of lift, will send up about 900 gallons of water per hour through a 1-in. pipe. For workhouses, infirmaries, and other large institutions where steam power is employed, and for manufactories, the invention affords a ready means for filling cisterns in the roof.

WAYGOOD'S HYDRAULIC-BALANCED PASSENGER LIFT.

MESSRS. R. WAYGOOD & Co., of Falmouth-road, Newington, have lately patented a hydraulic-balanced passenger-lift which has some good points to recommend it, and which we have seen in action at 39, Lombard-street and at Eastcheap Buildings. The lifts are smooth in working, and easily controlled by the attendant; they are free from balance-weight, chains, and overhead sheaves, and consequently the weight of the cage rests always and entirely on the ram. But the raising of the entire weight of ram, cage, and passengers would involve an expenditure of power altogether out of proportion to the useful work performed but for the means here adopted of economising the power. If, for example, the passengers weigh 10 cwt. and the cage and ram 30 cwt., three-fourths of the power exerted would be wasted unless it could be returned to the accumulator, and this is what is done in the case of the lifts we are now noticing, the water employed in raising the dead weight being used over and over again, thereby saving water and reducing the cost of working. In connexion with the accumulator are hydraulic pressure pumps of an improved form, made by Messrs. Waygood & Co., and worked by an 8-h.p. Otto gas-engine in the basement, the gas-engine being also used, in the case of the Eastcheap building, for driving dynamo-machines for the electric light.

KUHLMANN'S CEMENT-TESTING MACHINE.

We have had an opportunity of seeing in action, at the office of Mr. A. H. Kuhlmann, of 23, Great St. Helen's, a new machine for testing the tensile strength of cement. It is very compact and simple in action. Upon a dwarf column of cast-iron, 16 in. high, are fixed two levers, the leverage of the upper and longer one being 1 to 10, and that of the lower and shorter one 1 to 5, so that a total leverage of 1 to 50 is obtained. The levers are so adjusted on knife-edges as to reduce the element of friction in working to a minimum. The upper lever is fitted with a sliding weight for securing the correct positions of the levers, and on the lower lever is fixed one of the clamps for holding the briquettes, the other clamp being attached to the bed-plate of the machine at the base of the dwarf column

before mentioned. The briquette to be tested being adjusted in the clamps, a small bucket or tin pan is hung on the long lever, and into this receptacle fine shot is allowed to run slowly from a self-acting shot-run fitted beside the apparatus. The breaking-strain being exactly fifty times as great as the weight of the bucket and shot the result can be at once seen by placing the bucket with its contents on to a scale at the back of the machine, a dial below the scale-plate indicating not only the weight of the bucket and shot, but the breaking-weight at which the briquette succumbed.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,825. J. Shanks, Barrhead. Water-closets. Dec. 21, 1883.

5,834. G. Howard, Cricklewood. Mode of fixing flooring. (Comp. Spec.) Dec. 21, 1883.

5,870. W. Ross, Glasgow. Automatic drain-flushing apparatus. Dec. 27, 1883.

NOTICES TO PROCEED

have been given by the following applicants on the date named:—

Dec. 25, 1883.

4,094. W. Thompson, Wexford. Walls for fences, buildings, &c. Aug. 24, 1883.

4,150. G. Connell, Newcastle-upon-Tyne. Window ventilators. Aug. 28, 1883.

5,493. F. Leslie, London. Chimney cowl and ventilators. Nov. 23, 1883.

Dec. 28, 1883.

5,834. G. Howard, Cricklewood. Mode of fixing flooring. Dec. 21, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending December 29, 1883.

2,238. G. Nobes, London. Domestic fire-escape. May 2, 1883. Price 6d.

The ladder is made of rope with rigid rungs, and is kept coiled up round a revolving drum mounted in a box, which may form an article of furniture.

2,260. T. Wood, Bristol, and G. Milson, Stapleton. Hot-water heating apparatus for warming buildings. May 3, 1883. Price 2s.

The furnace is of semicircular shape, and in the upper part are hollow end-pieces, into which water tubes are fitted, and from which the circulating pipes are led. (Pro. Eng.)

2,282. T. J. Constantine, London. Open fire portable cooking-range. May 4, 1883. Price 6d.

The bottom bars are arranged to vibrate so that the packed fuel can be disturbed, and the smoke caused to fall. A flap valve in the passage to the chimney regulates the draught. The front bars are vertical, of a curved form, and tapered in cross section.

2,305. S. Fisher, London. Manufacture of wall coverings. May 7, 1883. Price 2d.

Linen, &c., is saturated with hot oxidised oil, or with collodion and sulphur, then pressed and hung in a hot-chamber to dry, where it is vulcanised. A suitable face is then made on it with oil and ground cork, which face is painted and printed.

2,321. B. Hess, Bayreuth. Manufacture of artificial stone for various purposes. May 8, 1883. Price 4d.

Serpentine, soapstone, feldspar, mica, quartz, and clay are pulverised and mixed with water, and then formed into the shapes required.

3,446. G. Howard, London. Manufacture of marquetry, parquet for flooring, &c. July 13, 1883. Price 2d.

The desired pattern is cut out of a thin lamina of wood, and then the part that is desired to be darker than the natural colour of the wood is subjected to the fumes of ammonia, and then replaced.

Accidents.—On the 27th ult., an alarming accident occurred at the bridge in course of construction for the Caledonian Railway Company over the Forth and Clyde Canal at Port Dundas. A number of men were engaged at a crane by which a heavy stone was being raised on to the bridge when the connecting pin of the crane slipped out, and the whole of the heavy apparatus fell upon the men at work. A labourer named Philip Reilly had his left leg fractured, and received other injuries of a serious nature. Michael Trainer, a labourer, and a foreman named Nicol Miller, were also injured. The occurrence has been reported to the Master of Works.—On the 28th ult., two houses adjoining each other in Parliament-street, Dublin, fell down. Fortunately no one was injured. One of the houses had been condemned as unsafe.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

IRON AND CONCRETE.

SIR,—I have been a user of Portland cement for nearly forty years, and may, I think, claim to know something about its behaviour.

I differ from your correspondent, Mr. Fajia, in the *Builder* of the 15th ult., as to the value of iron in a state of tension in combination with concrete for the formation of beams, floors, &c. A beam of concrete resting on its ends without a firm and unyielding abutment is a thing not to be depended on to carry much more than its own weight; but with a firm abutment and suitable depth of section it will carry a good load, with a wire rope or ropes, or with iron in any cheap form, such as the old types of wheels, firmly embedded in the concrete and forming a curve (with the ends close up to the upper surface of the beam at the ends, and dipping down in the centre to near the underside), it will carry safely a very heavy load, and will not yield until the iron begins to draw. If wire rope be used there will be considerable elasticity without damage, as the beam, if cracked, either by impact or dead weight, will spring up when the load is lessened. After the beam has cracked, the upper line is in a state of compression, and the wider the beam, of course the greater the power of resistance. A thick concrete floor so constructed may be considered as a number of beams united together, each receiving support from its neighbours, and exceedingly strong. The iron, however, should be curved, not straight; a straight rod of iron has not much supporting power, even if held firmly at the ends; it has a great deal when bent and embedded in a rigid material like concrete. There is sufficient adhesion of the concrete to the iron to prevent its drawing, but a precaution may be taken by beating up the ends a little, or, if rope be used, by twisting the ends.

In 1855 I took out a patent for fireproof construction on this principle, and included concrete arching. Previously to doing so I made some experiments to test the bearing-power of old wire rope, which is plentiful and cheap. I made a beam, 21 ft. long, 16 in. wide, 1 ft. 1½ in. deep, composed of plaster of Paris, a little lime, chopped straw, and coke, with a wire rope, about 1 in. diameter, embedded as above described. I first tried its strength at a bearing distance of 18 ft. 6 in. It deflected with its own weight about ½ in., and with two men on the centre there was a slight increase; with nineteen men standing as near the centre as possible it went down 1½ in. The span was increased to 21 ft., and a load of 3 tons put on, causing an additional deflection of ¾ in. In five days this had increased to 2 in. On removing this load it ascended ½ in. Four tons were then put on the centre and allowed to remain a month, when the deflection had increased to 1½ in.; on taking this off it ascended 1 in. The beam was at last entirely broken down, the rope being torn asunder with 54 tons. This was conclusive as to the bearing-power of the rope. I also experimented with some small beams of plaster of Paris. One, 3 ft. long, 4 in. deep, 1½ in. wide, with a piece of iron wire, bent to shape, and slightly turned at the ends, distance between points of support 2 ft. 7½ in.; it bore 4 cwt. in the middle with a deflection of ¾ in. A piece of Memel timber, of exactly the same size, made the same deflection with the same weight. This little plaster beam, without iron, would probably not have borne 13 lb. Good concrete would, of course, after a month be much stronger than the beam of plaster, and an additional rope would have given much better results.

W. B. WILKINSON.

SIR,—I do not wish to trespass on your space, but I think a reply is demanded from me to your correspondents in your last week's issue. I will, however, be as brief as possible.

It is not necessary for me to explain to Mr. Thwaite and to your readers that with say 30 lb. of iron instead of that used in the composite girder which Mr. Thwaite quotes, an iron beam could have been constructed which would have the same strength. As, therefore, it requires something over 6 cwt., or say 700 lb. weight of concrete, to supply the place of say 20 lb. of iron, I really am bold enough to say that the concrete in this instance is out of place and useless.

It is unnecessary to allude to the proposed formula, as it seems to me that the value of K must depend entirely on the amount and disposition of the iron in the beam.

Mr. Potter alludes to the vibration of concrete flats. I regret to say that this matter has been brought very prominently before my notice. I happen to have a concrete flat supported on ordinary 9-in. joists over my nursery, and there is undoubted vibration in this roof; at the same time, it is not possible to observe any cracking or breaking away of the concrete at the time of vibration; that, however, it does crack is proved, because from time to time this roof leaks, when the position of the water-mark on the ceiling of the room beneath shows as where the crack is, and we are able to stop it up. I think this in a small way supports my theory that with deflection, fracture occurs, invisible at first, but eventually sufficient for the water to find its way in. It is an undoubtedly faulty piece of construction: the beams should have been made strong enough to carry the flat, the flat only having to carry itself between the beams; if it had been so I should have had a tight roof.

As a covering or protection to iron against fire, I entirely agree with your correspondents that no better material than concrete can be used; but in that case the iron must supply the strength to the structure, and in warehouse and similar floors the combination has been most successfully applied. But, sir, this correspondence began by a suggested "iron and concrete" style of architecture, and I, therefore, again, for the reasons already stated, assert and maintain that concrete is best used and treated in a similar manner to stone and brick, and not as a substitute for iron.

HENRY FAJIA.

Erratum.—In Mr. Thwaite's communication on "Concrete and Iron," p. 876 (vol. xiv.), for "approximately the ultimate strength of a beam composed entirely of concrete," read "approximately the safety strength of a beam composed entirely of concrete."

"THE ARCHITECTURE OF ENGLISH FICTION."

SIR,—In the article under this head in your last number (p. 848), it is said that "Smollett simply ignores architecture altogether."

The criticisms of Matthew Bramble in "Humphrey Clinker" on the streets and buildings of London, Edinburgh, and Bath, more especially the latter, are too well known by Smollett's readers to permit of such a judgment to pass without contradiction. A writer should be judged by his masterpiece, and it is universally admitted that "Humphrey Clinker" is Smollett's masterpiece, and not only that, but one of the great masterpieces of English humour.

M. P.

SUMMONSES AGAINST OWNERS OF UNHEALTHY TENEMENTS.

At the Worship-street Police Court, on the 28th ult., several summonses, taken out at the instance of the Bethnal-green Vestry against owners of houses property in the parish for allowing nuisances to exist upon their premises, were heard by Mr. Bushby.

Mr. Burrows, the Sanitary Inspector, applied for an adjournment in the first summons against Thomas Watson Francis, for allowing a nuisance to exist at 4, Austin-street, Bethnal-green, the stated offence being that a water-closet was used as a bakhouse.

An adjournment for twenty-eight days was agreed to.

The owner of Nos. 3, 4, 5, 6, 7, 8, 9, and 10, Half Nichol-street, whose name did not appear on the summons, appeared to a complaint that he had allowed nuisances at those houses.

The Sanitary Officer stated that he made an inspection of the premises, and found the whole of them dirty and very dilapidated; the paving and the drainage were imperfect and dangerous, the water-closets were foul and dirty, and there were no ash-pits; besides which, the sinks in the yard were not trapped.

Dr. Bate, medical officer, said he saw the houses a fortnight after the usual notice was served, and the required improvements had not then been seen to, except in a few instances.

Mr. Bushby made an order for the remedy of the nuisances in a fortnight, and ordered the defendant to pay costs.

A similar order was made upon George Hartsoll, the owner of Nos. 3, 4, and 5, New Nichol-street. In this case the evidence was that the places were dirty and dilapidated, the paving on the floors and passages defective, the water-closets untrapped, and no ash-pits. Notices were served, but on the medical officer's visit subsequently the required repairs had not been undertaken.

Mr. Bushby readily made the order, and in several other cases assented to adjournments on the application of the complainants.

COMPENSATION CASES.

CRIDLAND V. METROPOLITAN BOARD OF WORKS.

THE Under-Sheriff of Westminster and a Special Jury have disposed of the case of Cridlend v. The Metropolitan Board of Works. It was a claim for compensation in regard to the Duke of Wellington, Spring-gardens.

On behalf of the claimant, Mr. Kelday estimated the present lease as worth 4,500*l.*, and Mr. E. F. Fuller (of Messrs. Fuller & Fuller) valued Mr. Cridlend's interest at 360*l.* beyond the aggregate premium and liabilities of 5,500*l.*

Mr. Haines, of Moorgate-street, and Mr. Miles (of Messrs. Lovejoy & Co.) considered the claimant's maximum interest was worth no more than six years' purchase on a net trading of 340*l.*

The jury, after some deliberation, awarded the claimant the sum of 2,980*l.*, independently of 2,000*l.* for renewal of lease.

LEVY V. METROPOLITAN AND DISTRICT RAILWAYS.

THIS case, heard before Mr. Under-Sheriff Burchell and a special jury at the Middlesex Sheriffs' Court, Red Lion-square, was a claim for compensation for the destruction of a fruiterer's business next door to the Pavilion Theatre, Whitechapel, for which 1,950*l.* was claimed.

Mr. Cooke Baines, surveyor, Finsbury-circus, said he should claim 120*l.* if this were a yearly tenancy, and he should not claim more for an agreement with only one year and three-quarters to run. He considered that the rental value was 130*l.* if in hand. He did not limit the claim to a year and a half's profit rental. Including 75*l.* for removal of stock and furniture, his estimate was 190*l.*, plus the trade. The premium of 20*l.*, spread over the three years, would bring the rent up to 123*l.*, so that practically there was no profit rental.

The Under-Sheriff thought that after this evidence the claim for leasehold interest must fail, but after some discussion it was intimated that it would be left to the jury.

Mr. Eason (of the firm of Reynolds & Eason, auctioneers and surveyors), estimated the present rental value at 140*l.* That gave a profit rental of 20*l.*, which, for the remainder of the three years would be 30*l.*, but under the agreement another year would have to be added.

Mr. Sheffield, solicitor to the claimant, and Mr. Young, lessee of the premises, were called, and decided on the terms on which they were let.

This concluded the evidence, and after hearing the addresses of counsel and the summing-up of the learned Under-Sheriff, the jury returned a verdict, divided in prospect of appeal, as follows:—Profit rental (including 10 per cent.), 11*l.*; fixtures, 20*l.*; loss on stock, 5*l.*; removal, 10*l.*; compensation for loss of business, 400*l.*; total, 446*l.*

DILAPIDATIONS.

GALEIN V. RUSSEY.

SIR.—As you made some comments on this case in the *Builder*, you may like to know that the Court on appeal adopted the plaintiff's reading of the repair covenant. However, rather than incur the trouble and expense of a re-hearing the plaintiff agreed to allow the amount awarded to stand; but he is relieved from paying the costs of the defendant.

JAMES EDMISTON.

FROM SCOTLAND.

Glasgow.—The Theatre Royal is to be reopened for the New Year's holidays. Since it was closed about a twelvemonth ago an important change has been made in the accommodation in the house. Originally the gallery was very steep, and from a number of the seats only a very imperfect view could be had of the stage. To overcome this objection the amphitheatre seats have been thrown into the gallery, and a broad promenade has been formed where the division between the two sections formerly existed. The alterations have been carried out under the direction of the Master of Works. The *Glasgow Herald*, in a report on "Trade in the West of Scotland in 1883," states that bricklayers have found trade during the year rather better than it was in 1882, all good men being fully employed. Roughly, the number of bricklayers employed in and around Glasgow is 550. The standard wage is 8*d.* per hour, the same as last year. As far as can be observed, and without knowing what work architects and measurers have on hand, the New Year promises to be as good, if not better, than the one just closed. The situation of the joiner trade is shown in the annual report just issued by the secretary. He says that during the past year a considerable improvement has taken place, so much so that all the workmen engaged in the large centres of industry have been fully em-

employed, while in nearly all the country districts there has been an absolute scarcity of men. The income for the year was 6,716*l.* 17*s.* 4*d.*,—an increase of 323*l.* 16*s.* 11*d.* over the previous year. The expenditure was 6,481*l.* 7*s.* 3*d.*, and the surplus being added to the funds on hand makes the total 8,126*l.* 11*s.* 6*d.* Lath-splitters have found trade for the past year very good,—a decided improvement on the last few years. The number of men at present employed is 63,—an increase of 15. During the year the men have succeeded in forming a society, the previous state of trade rendering it impossible to do so, though several attempts were made in that direction in the last four years. There are fifty-two enrolled members. Immediately after the formation of the society an advance of wages was secured to 6*d.* per hour, 4*d.* per hour over the previous year's rate of wages. Masons have been busy, and are likely to continue so,—the heavy building contracts on hand in the city placing that fact beyond question. There are some 1,800 men in the city, and the wage is 7*d.* per hour, 4*d.* better than last year. Connected with the building trade there are some 2,000 masons', bricklayers', and plasterers' labourers, a reduction of about 1,000 on the year. Throughout the year work has been partially fair, the wages ranging from 4*d.* to 6*d.* per hour; but at present prospects are not so good as they were at this time last year. Wages are about the same as last year, without signs of improvement. There are at present upwards of 600 members of the slating trade in Glasgow, being a considerable increase on 1882, and during the year they generally have been pretty well employed, there having been comparatively few idle men. The wage at present is 7*d.* per hour,—the same as last year, and the arrangement with the employers as to the rate holds good till May. The hours worked are fifty-one per week for eight months of the year. The other four months the average is about eight hours per day. Of new works in hand at present there are notably the Municipal Buildings, just commenced; the restoration of the extensive properties recently destroyed by fire in Buchanan and St. Vincent streets; the extensions at the City Fever Hospital, London-road; the operations in connexion with the City and District Railway, as well as the many private undertakings which have been arranged for in different quarters of the city. A good idea of the amount of building work on hand,—though sanctioned, the greater proportion remains to be executed,—will be formed from the following statement, prepared by Mr. John Whyte, assistant master of works:—

Linings granted by Dean of Guild Court, with Valuations, in 1882 and 1883.

Nature of Operations.	1882.		1883.	
	Linings.	Valuation.	Linings.	Valuation.
New dwelling-houses and Shops	24	£97,650	25	£113,500
Alterations on shops and dwelling-houses ..	35	13,671	41	17,835
Warehouses, workshops, offices, stables, byres, and alterations on such premises	144	299,830	157	193,275
Churches, halls, schools, and other buildings for public purposes, with alterations on such ..	24	97,985	24	360,350
Totals	237	£499,416	247	£684,960
Increase, 1883 ..	—	—	20	£185,564

The new halls in connexion with St. Bernard's parish church have been opened. These new buildings, which have been erected during the past summer by Dr. Stewart and his congregation, at a cost of 1,500*l.*, consist of a large hall and four smaller halls for congregational and Sunday-school work. The buildings have been erected from plans by Mr. William Murray, architect, Rutland-place.

Iron Bridge across the Spey.—A novel bridge for the conveyance of the workmen employed in connexion with the new railway along the Moray coast has (says the *Inverness Courier*) just been thrown across the river Spey at its widest part between Fochabers and Garmouth. The span is 500 ft., and the bridge consists of four steel wires or cables, on which runs an iron carriage weighing 140 lb. The iron carriage is lined and

floored with strong diamond lattice wire, thereby presenting little or no resisting surface to the wind. The four upper wheels have each a crank handle affixed, by means of which the passengers, seated back to back, can propel the carriage up to the short incline at the termination of each journey. For 400 ft. or so the trip is accomplished by gravitation. After the work had been completed, and the carriage out in position, Mr. Harper Sealfield, who was entrusted by the Great North of Scotland Railway with the design and execution of the scheme, started for the opposite shore, which he reached in the short space of 40 seconds, returning with a passenger, against a strong pressure of wind, in rather less than a minute, without having to use any exertion except in ascending the few feet of incline as he approached his destination.

Value of Property.—Scotch papers report that the estate of Allanhill, near St. Andrews, was sold on the 21st ult. at Edinburgh, realising the sum of 7,000*l.* It is stated that the same property changed hands in 1872 at 10,050*l.* The sale thus shows a reduction since then of over 30 per cent. The estate comprises about 230 acres.

PROVINCIAL NEWS.

Leeds.—The past year (says the *Leeds Mercury*) cannot be said to have been very successful so far as the building trade is concerned, although employers are, perhaps, more busy now than for some time past. Depression has ruled over this trade for several years, and many workmen are either out of work or only partly employed. The year has witnessed the completion of many important works, and has seen the commencement of a few. Perhaps first in importance of the building operations begun during the year is the new cattle-market, the site of which is now being prepared and levelled. There are also in progress one or two Board schools, besides the Yorkshire College, in College-road, the Coliseum, and the new Co-operative Stores. The Municipal Buildings are rapidly approaching completion. The erection of artisans' dwellings of the better class is being conducted on a moderate scale, chiefly in the neighbourhood of Burnley-road and Meanwood-road, and tenants for these offer themselves pretty numerous. Of houses at rentals of over 20*l.*, few, if any at all, have been erected during the year, and the demand for them is exceedingly poor. Under such circumstances, the prospect of any radical improvement for some time to come at any rate is small, though builders are sanguine that the worst has passed.

Carlisle.—Compared with last year, the building trade in Carlisle in 1883 has not been very active. The number of dwelling-houses for which certificates of occupancy have been granted was 54, against 64 last year. Most of these were erected in the Denton, Holme quarter of the town. In the beginning of May the bricklayers of Carlisle struck work for an advance of wages. They asked for 7*d.* per hour, but after some negotiation the wages were settled at 7*d.* per hour. At the end of June the joiners of Carlisle secured an increase of wages at the rate of a halfpenny per hour from the 1st of July, with a promise of an additional farthing per hour after the 1st of January, 1884, making the standard of wages 6*d.* per hour from the 1st of January.

Bradford.—It is proposed to erect a new central railway station here, and a meeting was held on the 28th ult. for the purpose of receiving explanations as to the nature of the proposed works. The scheme, if carried out, will provide through communication between the Great Northern and Midland and the Lancashire and Yorkshire railways.

Dover.—The first operations in connexion with the preparatory works for the proposed Harbour of Refuge at Dover will be commenced in March or April, when the erection of barracks for the accommodation of the convicts to be employed in the harbour works will be started. It is ultimately intended to employ about 5,000 convicts on the works; but, according to present arrangements, the first batch will not exceed sixty or seventy. These will be lodged in Fort Burgoyne, near the Castle, and within easy distance of the site for the proposed barracks. Their number will be augmented as the work proceeds and accommodation is provided.

Northampton.—Wood paving is being tried in this town, the roadway between St. Giles's

square and All Saints' Church being now laid with wooden blocks. Some 1,600 yards of wood have been laid altogether. The work has been done by a Norwich firm which has laid a good deal of wood paving in that city.

Bootle.—On Saturday last, the foundation-stone of the Bootle Reform Clubhouse was laid by Mr. W. Dent Dent, J.P. The building will occupy a site in Stanley-road, and will include reading-rooms, coffee-rooms, billiard-rooms, committee-rooms, and large hall to accommodate 700 or 800 persons, with the necessary ante-rooms and offices. There will be ample ground at the south of the hall for a spacious bowling-green, quit-ground, and skittle-alley. The architect is Mr. D. Lyon, of Leith-offices, Moorfields, Liverpool, and the builder is Mr. Eskridge, of Irlam-road, Bootle.

Rochester.—Formal assent has been given by the Admiralty to the plans of the South-Eastern Railway for extending their line from Strood to Chatham, and for the construction of another large railway bridge over the Medway at Rochester.

Wolverhampton.—On the 28th ult. the chairman of the Sanitary Committee of the Town Council, Alderman Major, laid the memorial stone of the Borough Hospital for Infectious Diseases now in course of erection on the site bordering the Roughhills, on the Dudley-road side. The building of which the stone formed a part is to be restricted to one hospital pavilion furnished with twenty beds, but there is land enough for the erection of three similar pavilions should they be found necessary. A disinfecting station and offices are also to be immediately proceeded with. The buildings will be plain and substantial specimens of brick-and-tile work, designed by Mr. G. E. Thoms, Borough Engineer, and erected by Mr. H. Clark.

Newcastle-on-Tyne.—The new premises in Newgate-street, recently erected for Messrs. Wilkinson & Simpson, wholesale chemists, in place of those destroyed by fire in August, 1882, are now completed. The front to Newgate-street is designed in the Queen Anne style, and executed in red Sussex bricks and Prudham stone. Mr. Edward Shewbrooks, of 2, Market-street, was the architect under whose superintendence the whole of the work has been carried out.

Liverpool.—The occasion of the "turning of the first sod" of the Liverpool Zoological Gardens was celebrated by a dinner at the Queen Anne Hotel, Walton, on the 28th ult. Mr. Millward, the company's manager, and Mr. Kitchen, the secretary, acted as chairman and vice-chairman, and were supported by several shareholders, the contractors, the architects (Messrs. Sugden & Son), Mr. John Shaw (the landscape gardener), and other friends. Mr. Millward gave a brief statement of the very encouraging progress which had been made, of the considerable works actually in hand and those contemplated and being matured for early execution by the directors and their architects. After Mr. W. A. Sugden had exhibited and explained the designs for various buildings and their general grouping, Mr. Shaw addressed the company, giving an outline of the general landscape effect he hoped to produce.

Dorking.—The Dorking Local Board have received the sanction of the Local Government Board to borrow 13,000l. for works of sewerage and sewage disposal. The whole of the Local Board District will be sewered by gravitation, and upon the separate system. The mode of treatment of the sewage will be by precipitation on "Hanson's" process, as at Golcar and Aldershot, but with the addition of subsequent land filtration. The area of the site to be used for outfall works consists of 10½ acres. The population of Dorking is nearly 7,000.

Nutfeld.—On the 1st inst. the South-Eastern Railway Company opened the new station at Nutfeld, near Redhill, on the old line to Tunbridge. The building has been designed by Mr. Alexander R. Stenning, architect, of 121, Cannon-street, and is constructed with timber framing, filled in with red brick, with a tiled roof. Mr. Stenning is also laying out for building the estate adjoining the station, the property of Mr. Henry Edwards, M.P. for Weymouth.

Christmas Cards.—Mr. J. O. Horsley, R.A., writes to the *Times* to say that he designed and drew the first Christmas card in 1846 at the suggestion of his friend, the late Sir Henry Cole.

SANITARY NOTES.

Newcastle-on-Tyne.—Dr. H. E. Armstrong, the Medical Officer of Health for Newcastle, has recently prepared for the Town Council a report on the high death-rate in Newcastle (which was 27 per 1,000 of population during the last quarter as compared with 24½ per 1,000 of the corresponding quarter of last year). Dr. Armstrong makes a number of suggestions with the view of rendering the city healthier. He urges that not only the sewers themselves, but the house-drains, should be laid by the Corporation employes, under official supervision. He points out the evils of ground-crowding, and makes the following recommendations:—

"With the view to prevent one of the great evils of our city, ground-crowding, it is suggested that, failing the acquisition of authority to check the number of houses to be built on a given area, power be sought to extend the regulation limit of room-space to 600 cubic feet per person occupying houses built after a certain date. The education of the different classes of society in the elements of hygiene is greatly to be desired. This, in the first instance, would probably be best brought about by popular lectures on hygiene at a nominal charge for admission. Arrangements might advantageously be made for a special course of lectures to plumbers, builders, and others on the sanitary requirements of houses, &c. Such a course could not fail to be of interest to householders, and should be well attended. Much good may be done by sanitary associations of philanthropic and educated persons, clergymen, doctors, &c., for the purpose of influencing public opinion, quickening the consciences of tenant-owners, &c.; with a branch under the direction of ladies for the organisation of house-to-house visitation among the poor, on the principle of the London Ladies' Sanitary Association."

The Sanitary Act, 1866.—The Local Government Board, by notice in the *London Gazette*, have declared the enactment contained in section 35 of the Sanitary Act, 1866, to be in force within the following parishes and districts of the metropolis, viz.:—The parishes of St. Marylebone, St. Pancras, St. George Hanover-square, Paddington, St. Mary Newington (Surrey) Camberwell, St. James and St. John Clerkenwell, Bermondsey, St. Martin-in-the-Fields, and St. John Hampstead; and the districts of Greenwich, Wandsworth, Holborn, Fulham, St. Saviour's, Plumstead, and Lewisham.

Unhealthy Areas.—The Local Government Board has requested the Clerkenwell Vestry to consider the question of taking steps, under the Artisans and Labourers' (Torrens's) Act, in relation to those unhealthy areas in the parish referred to in the official representation made to the Metropolitan Board of Works by the district medical officer of health, Dr. Griffiths, with respect to which the Metropolitan Board has decided not to prepare improvement schemes because of the small size of the areas.

MASTERS AND MEN.

Cardiff.—On the 27th ult., a meeting representing the various trades of the town was held to discuss the question of forming a Trades' Council for Cardiff. Mr. Gardner, of the Operative Stonemasons, was voted to the chair. Mr. W. Phillips, of the Operative Stonemasons, who is the chief promoter of the movement, pointed out the many advantages which would accrue from a combination of the various trades of Cardiff, and showed that they would assist each other, both morally and materially, in all matters affecting their best interests by a combination of this sort. The speaker concluded by moving, "That a Trades' Council be established in Cardiff." A discussion ensued, which was taken part in by Mr. Evans, of the General Union of Carpenters and Joiners; Mr. Lawther and Mr. Francis, of the Amalgamated Engineers; and delegates from other trades; and the motion was carried unanimously.

The Moral of Strikes.—It appears from the report of the Ohio Bureau of Labour Statistics that out of twenty-two strikes in that State in 1882, only five were successful. The time lost was, in the case of iron and steel workers in rolling-mills, sixteen weeks; boilermakers, six weeks; stair-builders, three weeks; and cigarmakers, two weeks. Advances in wages ranging from 8 to 16½ per cent., without strikes, were reported in twenty-three occupations during 1882. But it should be stated in regard to these figures that no doubt wages were in many cases advanced through fear of strikes, and

there were many employers who confessedly yielded to this feeling alone. With regard to the boot and shoe manufacture of Cincinnati, an interesting experiment in arbitration has been tried. A board of arbitration and conciliation has been organised, composed half of employers and half of employes. Before this board comes every dispute, and, pending a decision, work is to be continued in the shops as if nothing had happened. If the board cannot reach a decision, each side selects an arbitrator, and the arbitrators an umpire. The decision of these three is final. Each factory has a shop committee, composed of the proprietor or a member of the firm and two persons selected by the employes, who hear any dispute in the factory, and if they cannot agree they refer it to the board. No employer or employe is allowed to interfere with anybody because he is a union or a non-union man.

CHURCH-BUILDING NEWS.

Truro.—St. Paul's Church, Truro, is to be opened on Monday next, the 7th inst., after enlargement. The church is of quite recent erection, but has been found too small to meet the requirements of a growing and populous parish, and an addition, 40 ft. in length, at the chancel end, has been made. The new east window is a finely-carved cusped seven-light window with deep tracery. It is built of Polyphant stone, from Lewannick, near Llanconnet, of which material most of the new eastern part is constructed. The lower stage of a tower has also been added, forming the east end of the south aisle; and the east end of a north aisle has likewise been built to prepare for the addition of a north aisle to the church, which at present consists of nave and south aisle, divided by a neat granite arcade. A new roof-screen has been erected. It is of solid carved oak, and of much the same character as the one lately placed in Newlyn East Church, the architect having been in both instances Mr. Sedding, of London, though the details are quite different. The screen consists of four arches and a gateway, with a roof-loft, the style being fifteenth-century. The screen has been executed by Mr. A. Robinson, Broad-street, London. There are altogether nine steps from the level of the nave to the altar, the latter standing on four steps. The chancel floor has a paving consisting of black, red, green, and white marble designs, set in encaustic tiles. The east window is the crowning effect of the chancel. The seven lights are each filled with stained glass. This window has been given by Lady Smith as a memorial to the late Sir Philip Protheroe Smith. It is the work of Messrs. Westlake & Co., London. The chancel roof is richly illuminated. It is divided into panels each of which contains the sacred monogram, a delineation of the sacramental cup, or a flower. Messrs. Solomon & Co., of Truro, were the decorators. At present the chancel roof is several feet higher than the roof of the nave, but when funds permit the nave roof will be raised to the height of the chancel, which is 16 ft. The arcades and pillars are of Douling stone, whilst the remainder of the work is of Hopton-wood stone. Beneath the new chancel commodious vestries, cloak-room, and large meeting-room have been made. The architect, as before mentioned, was Mr. Sedding, London, and Mr. Bone, of Liskeard, was the contractor. The enlargement, so far as it has gone, will cost 2,500l.

Flyford Flavell.—On the 28th ult. the church of Flyford Flavell was re-opened, after restoration. The principal landowner in the parish is Mr. W. Laslett, who is Lord of the Manor and Patron of the living, and who some years ago placed in the hands of trustees for charitable purposes a large landed estate at Hinton-on-the-green, in the county of Gloucester, from the revenue of which it was provided that Flyford Flavell Church should be re-built or restored. The church was Early English in style, and originally consisted of chancel, nave, tower, and porch. The tower has been underpinned, a new concrete foundation inserted, and the decayed stonework renewed. The nave has been for the most part rebuilt, retaining as far as possible the old features and portions of the old work, as the old windows, bench ends, and the chancel screen, in the reconstruction of which a design based upon some fragments of the old screen has been followed, and a very interesting piece of work has resulted. The chancel, which was a modern erection of the present century, has

been replaced by a new one, in keeping with the existing portions of the Early English church. A new porch has also been added, and a vestry on the north side of the chancel is an entirely new feature. The roofs are all new, but have the same pitch and form as the original ones. All the new fittings, with the exception of the chancel screen (which is oak) are of pitch-pine. The new work is of Inkberrow stone throughout. The nave is paved with Webb's tiles and the chancel with Godwin's (Hereford) tiles. The church will be warmed with hot air. The architect employed was Mr. W. J. Hopkins, of Worcester, and the builder was Mr. J. Stanley, of Broom. The cost of the work was about 1,500*l*.

London.—A meeting of the united parishes of St. Mary Magdalen and St. Gregory-by-St. Paul, was held on the 27th ult. in the Vestry-room of the parish church. The vestry considered the plan and an estimate of the cost of certain alterations in the fittings of the church. The Chairman read a letter from Mr. Butterfield, architect, which stated that the proposed alterations would cost 167*l*. Mr. Fawell said he thought the proposed alterations would entirely spoil one of Wren's churches. The Chairman said the church had been materially altered since Wren left it. After some further discussion, the subject was adjourned for further consideration.

Maybole (Ayrshire).—The mission church of St. Oswald was formally opened and consecrated by the Right Rev. the Bishop of Glasgow, on the 18th ult. The church is built in the Early English style, and is seated for nearly 200. It is built of local freestone, and consists of nave, chancel, porch, and vestry. It is believed that the total cost will not exceed 600*l*. The architect was Mr. Miles S. Gibson, of 79, West Regent-street, Glasgow.

Stoke (Staffordshire).—A new church is about to be erected at Mount Pleasant, Stoke, in lieu of the present Mission church. The new building is proposed to be dedicated to St. Paul, and will be erected on a site given by Mr. G. Smith, of Clifton, in Grove-road. Plans have already been prepared by Messrs. Lynam & Rickman, architects.

Compton Gifford.—A new reredos has been erected in Emmanuel Church, Compton Gifford, by Mrs. T. Rendle, in memory of her late husband, who was churchwarden for several years. The reredos is the work of Mr. Harry Hems, of Exeter. It is built of Caen stone; the central arch is filled in with alabaster, worked in gold, with the monogram "I.H.S." surmounted by a crown, cut in Devonshire marble and inlaid.

Haworth (Middlesex).—A substantial and ornamental high gate has recently been erected, as a memorial, at the entrance to the churchyard of the parish church, of which the Rev. J. L. Winslow is the rector. It is executed in English oak and fixed upon a stone base, and the roof is covered with plain tiles. It forms a very picturesque object in conjunction with the church as seen from the road and park. The work has been executed by Messrs. Dove Brothers, builders, of Islington, at a cost of 350*l*., under the directions of Mr. George Low, architect.

STAINED GLASS.

Embleton.—An interesting memorial to the late Sir George Grey, of Faldoon, has just been erected in Embleton Church. His many friends were desirous of perpetuating his memory, and resolved to fill with painted glass the windows of the chancel of his parish church. Embleton Church is an ancient building, dating from the fourteenth century, but was left unfinished by its original designers. A new chancel was built in 1864 by the rectors, Merton College, Oxford, from the designs of Mr. F. R. Wilson, architect, Alnwick. The windows are the work of Mr. C. E. Kempe, London.

Belfast.—A memorial window to the late Mr. B. T. Hewitt, which the workmen of Messrs. Heaton, Butler, & Bayne have been for some time erecting, under the superintendence of Mr. E. N. Banks, C.E., in the chancel of St. Thomas's Church, Lisburn-road, has just been completed.

Worthingham.—A painted east window has just been placed in the Church of Worthingham All Saints, near Beccles. The window was dedicated at the service on Christmas morning. The lower part of the window is divided by three lights. The central one contains a representation of the Crucifixion, with Mary

Magdalene at the foot of the cross; while the lights on either side portray the two Marys, St. John, and St. Joseph of Arimathea. The four smaller central lights above have angels, two bearing instruments of music and the others a crown and a palm branch. In the tracery are introduced emblems of the four evangelists, &c. The window was executed by Messrs. Clayton & Bell, of London.

SCHOOL-BUILDING NEWS.

Worcester.—New Sunday schools for the parish of St. Mary Magdalene, Worcester, have been opened here. The buildings comprise a large room, 70 ft. by 23 ft., and about 29 ft. high to the ridge; two class-rooms, two lobbies, and the requisite out-offices. The walls are faced externally with brown and grey Bromsgrove stone, in random courses, rough punched, and relieved with Bath stone bands. Internally they are of red pressed brick to the height of 4 ft. 3 in., and above this height of Ironbridge buff-coloured bricks, with an intervening band of red and buff bricks in diaper pattern. The windows and other dressings are of Bath stone. The roofs are all of pitch-pine, open-timbered, plastered between the rafters, supported by framed trusses having arched ribs, and covered with red Broseley tiles. The internal joiner's work is of yellow deal, varnished. The floors are of wood blocks, laid, herring-bone pattern, on a bed of concrete, and the entrances are laid with Webb's encaustic tiles. The school-room and class-rooms are heated by open fire-places having red Alvely stone chimney-pieces. Separate play-grounds are provided for the boys and girls. The works have been carried out by Mr. J. H. Beard, from the designs and under the supervision of Mr. Lewis Sheppard, architect, Sansome-walk. The total cost of the works is under 1,500*l*., but the Bromsgrove stone facing, which adds much to the good appearance of the schools, is the gift of Colonel Johnstone. Mr. John Rouse, Lowesmoor, presented the stone fenders. The gas-fittings were executed by Mr. G. F. Wells. The Tything.

Cardiff.—On Tuesday, the 18th ult., the new Board School at Grangetown, Cardiff, was opened by Sir E. J. Reed, M.P. The school is a two-storied building, and is divided into three departments, the boys' school being on the first floor and approached by a broad flight of Radyr stone steps. Each department has a main schoolroom and three class-rooms; and the class-rooms are so arranged that in each case they can be easily supervised by the head teachers through glazed sashes from the main room. The infants' schoolroom is fitted with two large galleries and dual desks. The other schoolrooms are fitted entirely with dual desks. The class-rooms are also fitted with dual desks for the senior children; but one class-room in each department is provided with a gallery. The main schoolrooms are heated with Doulton's radiating tile stoves, and the class-rooms with open fire-places. The walls of the rooms internally are plastered. The roofs are all open to the collar, and reveal principals of Baltic timber covered in with match-boarding. The match-board dado, doors, and furniture are all executed in pitch pine, and the timber work in sight internally throughout the building is stained and varnished. The building is designed in the Gothic style, with early French detail and carvings. The carving has been executed by Mr. Clarke, of Llandaff. The walls are built with thin coursed hammer-dressed stone of a grey tint, relieved with Bath stone dressings and chisel-dressed strings and arch stones of red Castle Coch stones. The roofs are covered with green slates, and the ridges and some of the finials are executed in red terra-cotta. The bell flèche is constructed of timber. The caretaker's house is situated on the east side of the school. The drains are ventilated on the "Banner" system. The accommodation provided is for 426 infants, 309 boys, and 309 girls, making a total of 1,044 school places. The contract was signed by Mr. D. J. Davies, of Woodville-road, Cathays, for 8,849*l*., but in consequence of the bad nature of the site for building purposes it was found necessary to spend another 960*l*. on the foundations. The building, therefore, is constructed on brick arches thrown over concrete piers, which have their base upon the gravel bed, some of the piers

having to be sunk to a depth of 27 ft. below the surface. The school is the largest but one that has been built by the Board, and is stated to be one of the cheapest, for at the contract sum, which includes all fittings, boundary-walls, &c., it works out at 8*l*. 9s. 6d. per head. The work has been carried out by the contractor, under the supervision of the architect, Mr. E. M. Bruce Vaughan, 74, Crockherbtown, Cardiff.

Newington, Hull.—The Parish Rooms and Sunday Schools in connexion with the Church of St. John-the-Baptist are now completed, and were opened on the 18th ult. by the Vicar. The building is in St. George's-road, adjoining the church, and comprises a large room, three class-rooms, soup kitchen, &c., and has been erected by Mr. Mark Harper, contractor, Hull, from the designs and under the supervision of Mr. Edward Starr, architect, Chancery-buildings, Manor-street, Hull; the total cost being about 900*l*.

Grays.—A new Board school at Grays, Essex, erected by the Gray's Thurrook School Board, has been opened. The plans were prepared by the architect of the Board, Mr. E. Clerk Allam, of Romford, and the building has been erected by Mr. William Wood, contractor, of Duke-street, Chelmsford. The school provides accommodation for 642 children. The style adopted by the architect is described as "modified Queen Anne." In the centre of the range stand the residences of the principal master and mistress, comprising parlour, living-room, scullery, and three bedrooms. On the right of the residences stands the boys' school, surmounted by a lofty bell-turret. This room is 60 ft. long by 32 ft. wide, and provides accommodation, including the class-room, for 222 boys. The class-room, as also that on the girls' side, is separated from the main room by a revolving shutter, which can be raised or lowered at pleasure. In the rear of the class-room are the Board-room and lavatories for the boys. On the further side of the residences is the girls' school, 60 ft. by 22 ft., giving accommodation, with the class-room, for 180 girls. In the rear of this, and extending at right angles with it, is the infants' school, 62 ft. by 22 ft., containing two galleries, which will, with the adjoining "babies' room," provide accommodation for 240 children. These last are also provided with lavatories, the whole of which have been fitted up with Finch's tip-up basins. The girls' and infants' rooms are warmed by means of Captain Galton's stoves, while the boys' room is warmed by hot air, the furnace for which,—one of Constantine's,—is fixed in the basement, below the Board-room.

Gosforth.—New Sunday Schools in connexion with the United Methodist Free Church at Gosforth were opened on Christmas Day. The schoolroom is 47 ft. long, 28 ft. wide, and 20 ft. high to the ceiling above the collar-beams; the roof couples are of pitch pine varnished; and the walls are lined with stained and varnished boarding to a height of 4 ft. 6 in. from the floor, and finished above with stucco, tinted cream colour, with a moulded wooden cornice to the ceiling. Two class-rooms, each 16 ft. long and 13 ft. 6 in. wide, open out of the schoolroom. The whole of the buildings are finished with Kenton stone, and the roofs are covered with blue Welsh slates and ornamental red tile ridges. The principal front is in Ivy-road. The work has been carried out by Mr. Matthew Robson, of Gosforth, from the designs and under the personal superintendence of the architect, Mr. Edward Shewbrooks, of Newcastle-on-Tyne. Messrs. Walker & Emly, of Newcastle, supplied the hot-water pipes.

Miscellaneous.

Archaeological Discoveries in Lebanon.—M. Clermont-Ganneau contributes to the *Times* an account of an important discovery recently communicated to the Académie des Inscriptions et Belles Lettres, by M. Barbier de Meynard, the well-known Orientalist, consisting of two large unknown inscriptions of Nebuchadnezzar, found in Lebanon by M. Pognon, assistant-consul of the French Republic at Beyrouth. The two inscriptions each contain a different text. They commence by the titles of Nebuchadnezzar,—"Nebuchadnezzar, King of Babylon, the illustrious pastor, the servant of Morodak, the great Lord, his Creator, and of Nebo, his illustrious son, whom his Royalty loves." Unluckily, the two inscriptions do not comprise any historical passage.

An "Old Curiosity Shop."—An old house in Portsmouth-street, Lincoln's Inn-fields, said to be the one selected by Charles Dickens as the scene of many of the incidents recorded in the "Old Curiosity Shop," is now about to be demolished in consequence of its dangerous condition. Information reached the Metropolitan Board of Works late on Christmas Eve that the building and the two adjoining houses were collapsing. Messrs. J. & J. Greenwood, the contractors to the Metropolitan Board of Works, were immediately instructed to shore up, and during Christmas-day were busily engaged. The premises now appear to be used as a store for waste-paper, the adjoining houses being let out in tenements, some of which are dangerously overcrowded. The whole condition of this neighbourhood is squalid in the extreme, and little effort seems to be made by the authorities towards keeping the streets clean. The authenticity of the house as the original of the "old min's" house is more than doubtful, but such is the faith in it, and the attachment of English folk to the association with Dickens's characters and scenes, that scarcely had the notice appeared in the papers that the home of Little Nell was going to be pulled down, when a crowd of admirers and gazers appeared in Portsmouth-street. People with sketch-books came to draw the house from the two only accessible points,—the one looking towards Lincoln's Inn-fields, the other outside a public-house opposite the "Curiosity Shop" itself. People without sketch-books came to look at the people who drew; people with work walked past briskly, some pausing a moment, and declaring how strange it was that they had never noticed the place before, though they had passed it every day of their lives. In the parlour stands now a box room, the present proprietress, making a good profit by selling sketches of the abode at 2d. apiece. The quaint little house has not much to recommend it in its outward appearance, and had it not been connected with the name of the man who felt with and loved the people, they would now pass it by unheeded, instead of cherishing it as an old favourite, out of love for his memory.

The Goldsmiths' Company's Prizes.—The twelfth successive annual competition for prizes offered by the Goldsmiths' Company, with a view to the encouragement of technical education in the design and execution of works in the precious metals, has just been concluded, and the judges, who have been assisted in their duties by Mr. H. H. Armstrong, R.A., have made the following awards:—

For the best model of a group, "Highlander bringing Home dead Deer on Pony": First prize, 70l., Mr. G. Worrall; second prize, 35l., Mr. James Griffiths. For the best design of a Racing prize (value 300l.), of a ewer and dish for *reposé* work: First prize, 50l., Mr. Tom Smith; second prize, 35l., Mr. W. R. Lethaby; third prize, 20l., Mr. S. Thorpe. For the best specimens in *reposé* work of a panel by Donatello: Equal prizes of 30l. to Mr. T. Spall and Mr. A. Ostergaard. For the best specimen in *reposé* work of a relief of three boys, by Thorvaldsen: First prize, 35l., Mr. T. Spall; second prize, 20l., Mr. G. H. Deere; extra prize, 15l., Mr. A. W. Edwards. For an engraved cigarette case in silver: Prize of 10l., Mr. W. R. Corke. For an engraved silver waiter: First prize, 20l., Mr. W. J. Deane; second prize, 15l., Mr. J. Menzies. For a manufactured silver frame for cabinet-sized photographs, with perforated work: a prize of 30l., Mr. J. Hornby, jun. For the best specimen of cast casting in silver of a bust of Ariadne: a prize of 15l., Mr. W. Priest. For a silver glove-box, with very flat chasing: a prize of 20l., Mr. W. Bullas.

In addition to the above prizes the Company have awarded gratuities to several competitors, and have commended several additional works.—*City Press.*

Fulham Infirmary.—In the new Infirmary recently erected in Palace-road, Fulham, from the designs of the architects, Messrs. Giles & Gough, considerable attention has been given to the question of warming and ventilation. The Guardians of Fulham Union have in this respect set a praiseworthy example which deserves to be widely followed. To a committee of the Guardians was confided the task of selecting for the various sick wards, numbering about thirty, a stove which should best combine the two important requisites,—heating and ventilation. A limited number of leading manufacturers were therefore invited to compete, and after a strict test of the stoves sent in for the purpose, the choice fell upon the "War Office Ventilating Air Stove," manufactured by Messrs. Yates, Haywood, & Co.

The Calcutta Exhibition.—A Calcutta correspondent of the *Leeds Mercury* says that the English exhibitors make a very fine show in all departments, except art-work. The English exhibitors number nearly 600, and they occupy nearly 60,000 square feet of space. They are overpoweringly strong in metal-work and machinery, though some Indian firms, notably the Carnac Ironworks of Bombay, and the Baru Company of Howliath, near Calcutta, compete with the English exhibits. The Carnac Ironworks Company have erected an iron building in the grounds to illustrate what may be done with iron in architecture. The columns which support the roof are of iron, and are so arranged as to make each pair of columns a bay or doorway. In those parts of India where the ants make war on timber, and let the houses about the ears of the occupants periodically, this form of building should be acceptable and popular. This is a form of exhibit which the English producer may envy, because it is so perfectly adapted to the country that even native prejudices must go down before it. The English manufacturers, however, have generally worked in a groove which will bring them into contact with native prejudices. The native small farmers, for example, scoop water from a river or pool to a higher level, for irrigation purposes, by all manner of old-fashioned methods, yet here are pumps and other mechanical methods of drawing water. The natives thrash their own corn by driving a yoke of oxen over the sheaves as they lie upon the thrashing-floor; yet here are machines to be worked by steam, and turn out 100 qrs. a day if need be.

A Threatened Industry.—According to the Paris correspondent of the *Times*, one of the Parisian industries is threatened with abolition. All who have had occasion to traverse the streets towards midnight are familiar with the *chiffonniers*, armed with a lantern and a crooked stick, who rummage the rubbish heaps deposited at the edge of the kerb by the *concierges* the last thing at night. The dexterity with which, while only slightly stooping, they transfix any bit of rag or paper and drop it into the bag on their shoulder has always been a curious and picturesque sight. The Prefect of the Seine is about to change all this. From January 15 every *conciergerie* is required to supply himself with a box into which to empty the rubbish of the tenants, and to have it ready for the dustcarts on their morning rounds. Regard for the safety of the box will naturally prevent their doing this overnight, and even should one here and there do so the *chiffonnier* is forbidden to empty the box on the pavement to scrutinise its contents. The evident effect, if not object of the regulation is to suppress the *chiffonnier's* occupation, and to give the dust contractor a monopoly of the rubbish. The existing system, however, according to the correspondent, has given perfect satisfaction, and nobody understands why it is to be disturbed.

An Arbitrator's Award.—At the last meeting of the Stapleton (Bristol) Local Board, the clerk (Mr. F. Rawle) read a report drawn up by Mr. J. H. Smith, C.E., Taunton, who was appointed arbitrator between the board and Mr. T. K. Yalland, the contractor for the sewage works, with reference to the value of the work done by the latter. The report stated that the workmanship throughout was of excellent quality, and the materials used were of the best description. The whole of the work showed careful construction and finish. Mr. Rawle next read the award of the referee, which he made clear to the board by making a comparison between Mr. Smith's figures and those put forward by the contractor. The original contract amount was 13,920l., and Mr. Yalland claimed 503l. 4s. 7d. for extra work making a total of 14,423l. 4s. 7d. His deduction for works not carried out amounted to 2,150l. 14s. 10d., and consequently the sum claimed by him was 12,272l. 9s. 9d. Mr. Smith, the referee, had, however, assessed the value of extras at 1,341l. 8s. 5d., and this added to the contract price amounted to 15,261l. 8s. 5d. He estimated the sum to be deducted for works not carried out at 2,484l. 12s. 10d.; so that the amount to which Mr. Yalland was entitled was 12,776l. 15s. 7d.

The Arundel Hotel, Arundel-street, Strand.—We are asked to mention that the carrying out of the constructional ironwork of this building, which is of a somewhat heavy and difficult arrangement, has been entrusted to Mr. Archibald D. Dawney, A.-M. Inst. C.E.

Well-earned Retirement.—The meeting of the Whitechapel District Board of Works on the 27th ult. was specially convened to consider the proposal that, upon Dr. Liddle, the medical officer of the district, resigning his office, an annual allowance, amounting to twenty-eight sixtieths of his present salary, or 325l., be granted to him by the board, and that such allowance be charged to the funds of the board in the manner directed by the provisions of the 29th Vic., cap. 31, with regard to superannuations. Colonel Munro, in moving the adoption of this, referred to the long, honourable, and faithful service Dr. Liddle had rendered to the district. Mr. Nicholson, as a member of the board from 1855, heartily seconded the motion. The chairman (Mr. Gladding) said they were all conscious that the work done by Dr. Liddle had never been done perfectly, but was performed out of his deep concern for the public health and welfare. In addition, therefore, to the formal resolution now before them, he thought the board would join in a special resolution expressive of the warm feelings of honour and respect entertained for their old friend and coadjutor. The formal resolution of superannuation was unanimously adopted, and in addition the clerk was asked to draw up the special personal testimony suggested by the chairman.

A British Workmen's Hall and Home in Paris.—An institution of an exceptionally interesting character has, the correspondent of the *Standard* says, recently been opened in Paris,—namely, a British Workmen's Hall and Home. The idea owes its realisation to the zeal of Miss Ada Leigh, a lady ever foremost in all good English movements in Paris, but it was initiated by the working men themselves, and upon them must depend its future prosperity. A certain number employed in the building trade and other branches of industry appealed a few months ago to Miss Leigh to take up their cause. They had, they said, experienced the great need of clean, healthy, and comfortable lodgings, and of a place for social reunion. Their wages might be somewhat higher than in London, but money did not go so far, on account of the exceptional dearness in Paris of the common necessities of life. They wanted no charity, but simply active sympathy, and a start to enable them to provide themselves with quarters resembling somewhat the homes they had left in England. Miss Leigh at once set to work, and found within a stone's-throw of the Arc de Triomphe,—a district where numbers of our countrymen are employed,—a house, being No. 12, Avenue MacMahon, with a large area, which serves for a dining and meeting hall. About 150l. have been subscribed. Some 250l. more are required to pay for the fitting up.

The Association of Public Sanitary Inspectors.—At the monthly meeting of this Association, to be held this Saturday, the 6th, at six p.m., in the Library of the Social Science Association, 1, Adam-street, Adelphi, the discussion on the papers, "The Position of the Sanitary Inspector," by Mr. Skipworth, of Caistor Union; and "Tenure of Office," by Mr. May, of Ramsgate, will be resumed, and in connexion therewith the following resolutions will be submitted:—

1. That the position of the Metropolitan, Urban, and Rural Inspectors [should] be assimilated.
2. That in order that the position of the sanitary inspectors be strengthened, it is expedient that the appointment of all officers should be approved of by the Government Sanitary Authority, and no officer dismissed by any local authority without final appeal to, and approval of, the said Government Sanitary Authority.

After which a paper will be read on "Sanitary Inspection of the Dwellings of the Poor," by Mr. T. Backworth, Sanitary Inspector of St. Saviour's, Southwark.

The New Houses of Parliament, Cape Town.—The tender of the well-known firm of Gillow & Co., of 406, Orford-street, has been accepted for furnishing the Houses of Parliament and State Offices at Cape Town, and Messrs. Gillow have received instructions from the Government to proceed with the work forthwith.

A Colossal Bronze Statue.—Mr. Birch, A.R.A., has nearly completed the cast of a colossal bronze statue to be erected in a public park at Toronto, to the memory of the Hon. George Brown, a leading Liberal member of the Canadian Parliament, who was assassinated about two years ago by one of his workmen (who had been dismissed for drunkenness).

New Premises, Cornhill.—Among recent metropolitan improvements we may note the re-building of some premises in Cornhill for Messrs. Street & Co., the well-known advertising agents. The operation of rebuilding was conducted in such a manner as to allow the tenants to continue their occupancy the whole of the time, the several floors being pinned up from below. When the front was rebuilt another top story was added, and the interior renewed floor by floor. While the works were proceeding, the old cross wall, upon which the upper floors, with the clerks in them, were being temporarily supported—began to give way at the base, and occasioned considerable anxiety until a fresh purchase was gained for the supports, when the cross wall was rebuilt, and everything made good. The style of architecture adopted is Italian Classic, as that deemed best adapted for commercial frontages, but with rich ornamental carving in the lower parts in keeping with Renaissance work. The building was erected from the designs and under the personal superintendence of Mr. William C. Street, of 4, Westminster-chambers, the builders being Messrs. Dove Bros., of Islington.

The Mersey Tunnel.—The boring of the heading of the tunnel is now practically an accomplished fact, less than 120 yards remaining to be pierced, so that by the third week in the new year the subaqueous communication between Liverpool and Birkenhead will probably be effected. Further, it is hoped that by Christmas next the railway will be ready for traffic, and trains will be running beneath the river. The operations have been carried out under the personal superintendence of the engineers, Messrs. Brunless & Fox, by Mr. John Waddell, of Edinburgh, the whole being under the control of Major Isaac. The advantages of the tunnel for other purposes than railway traffic cannot be estimated too highly. At present, the telegraph lines connecting Liverpool with Birkenhead run *via* Runcorn, while there is no intercourse by telephone. With the completion of the drainage heading, these inconveniences and wants will be remedied; the cables or wires will run direct under the Mersey.

A Presbyterian Church at San Remo was opened on the 20th ult. The building, which is Italian in style, is an oblong structure, measuring 60 ft. by 30 ft. The basement is of red granite. The walls above this are coated with terra cotta brought from Milan. On each side there are three large windows. The facade, which faces south, is to be richly ornamented. The building will hold about 250 worshippers. Provision has been made for a campanile to be raised above the vestibule and gallery. The architect of the building is Signor Pio Soli. The site and the building together will cost 2,500*l.* or 2,600*l.*

Light in Basements.—In some of the extensive new buildings which are in course of erection in Chancery-lane, for purposes of business, extensive use is being made of Hayward's semi-prism lights in securing light to the basements, with results which are likely to be exceptionally successful in increasing the available space for business purposes. The importance of such an expedient, in regard to the commercial value of business premises in London, is, of course, very great, where space is so valuable, and light so difficult to come at. We are also told that these lights are largely used in the First Avenue Hotel, Holborn.

A Church Burned down.—The parish church of East Hanningfield, near Chelmsford, was destroyed by fire on Sunday afternoon. The fire broke out in the roof of the nave through (it is said) the overheating of a stove-pipe, and before the engine could arrive from Chelmsford it obtained a complete hold of the building. Nave, chancel, and tower, with their contents, including the bells, were destroyed, only the bare walls and arches being left standing. The church, an ancient one, was restored in 1844. The east window, which dates from the sixteenth century, was saved at great risk.

Wesleyan Methodist Chapel Building.—It is stated in the "Wesleyan Calendar" for 1884 that the sum of 367,218*l.*, principally on new erections and enlargements, has been expended on Wesleyan trust property during the past year; 266 other cases have been completed during the same period, at an outlay of 131,922*l.*; and 386 additional cases are now in course of completion, at an estimated cost of 292,174*l.*

Christ's Hospital.—Grave rumours reach us in regard to the sanitary condition of the Hertford branch of Christ's Hospital. A little boy has died recently at home from a disease apparently contracted in the school, and we are informed on good authority that this disease was typhoid fever. Our informant adds that a few weeks ago the school infirmary was full, and that two deaths had taken place in it. We trust these reports may prove to be unfounded, or at any rate exaggerated. More harm than good is generally done by the suppression of facts in a case like this. If typhoid or any analogous disease has broken out in the school, the fact should at once be made known, that parents may, if they think fit, remove their sons. A thorough sanitary investigation should at once be undertaken, for if our information proves correct, it is almost certain that water or drainage, or both, are in fault.—*The Lancet.*

Another Tramway Line in South London.—On the 21st ult. a new service of trams was commenced in South London. This was upon the route commencing at Camberwell-green, running through Coldharbour-lane, past Loughborough-junction, down Gresham-road, across Erixton-road, and *via* Stockwell-road, to the Swan, Stockwell. The line is chiefly a single one. The line is in course of extension to Norwood, *via* Loughborough-junction, Milkwood-road, Half Moon, Dulwich, and Norwood-road. The cars exhibit some marked improvements, not the least of which is the abolition of the awkward and dangerous rise in the roof over the end canopies. The line is also to be extended, *via* the South Lambeth-road, from Stockwell to Vauxhall.

Monument in Sonning Church, Berks. A memorial of the late Vicar, the Rev. Canon Pearson, has been placed in Sonning Church. It consists of a full-length recumbent figure in white Carrara marble, representing the canon in the attitude of prayer. He is clad in surplice and stole, the head being supported by two angels, one carrying a harp, and the other the model of a church, emblematical of Canon Pearson's love for music and architecture. The figure is placed under the arch between the vestry and chancel. The cost of the memorial has been about 1,000*l.* The group has been carved out of one solid block of marble by Mr. Thrupp, of Marylebone-road, London, the architectural details having been arranged by Mr. Nutt, of Windsor.

Gray's Inn.—It is stated that, the present accommodation at Gray's Inn Library being insufficient, the Benchers have decided to have a new wing added to the present structure, the erection of which will shortly be proceeded with. Rumour also has it that the Benchers contemplate some improvements in the appearance of their buildings facing Gray's Inn-road, now in course of being considerably widened. We trust that there is good ground for this report, for the dingy, dreary, not to say ramshackle appearance of the long range of brick buildings will be more marked than ever when the new roadway is thrown open.

Institution of Civil Engineers of Ireland.—The Council of the Institution of Civil Engineers of Ireland have awarded the Institution medal to Mr. Richard B. Saunders, B.E., M.Inst. C.E.I., county surveyor to the King's County, for a paper entitled "Steam Traction on Common Roads," read by him before a general meeting of the Institution, held at Trinity College, Dublin, on the 7th March last.

Gosforth.—It is stated that the Earl of Wemyss (until lately better known as Lord Elcho) is going to spend 80,000*l.* in building a new house at Gosforth, the principal family seat in East Lothian. The "policies" of Gosforth extend to the Firth of Forth, and adjoin those of Archerfield, both being famous for their gardens.

The Christmas Dinner to the aged poor of Exeter, given under the auspices of Mr. Harry Hems, appears, from accounts received, to have gone off very successfully. By the willing aid of his workmen, one of the large workshops of his new premises was decorated and fitted up so as to make an admirable dining room for his sixty or seventy guests.

New Buildings, Brick-court, Temple.—To our notice of these buildings, described and illustrated in our last, we may add that the whole of the chimney-pieces and fenders, which are in polished Hopton Wood stone, and also the tile-hearths, were supplied by Messrs. J. W. Bird & Co., of Euston-road.

The Chair of Naval Architecture at Glasgow University.—At a meeting of this court held on the 21st ult., Mr. Francis Elgar, consulting naval architect and engineer in London, was unanimously elected to the John Elder Chair of Naval Architecture (including Marine Engineering) in the University.

Kilwinning.—At a meeting of the School Board, held on the 26th ult., Mr. James Stewart presiding, it was resolved to re-erect the spire at Fergus-hill School, which was blown down during the recent storm, and Mr. Armour, architect, was instructed to prepare a plan and specifications.

The Hospitals Association.—The inaugural meeting of this association will be held, by permission of the Lord Mayor, at the Mansion House on Friday, the 1st of February, at three o'clock. His lordship will preside. Further particulars will be shortly announced.

Quantity Surveying.—A special course of ten lectures on this subject will be given at the City of London College, White-street, Moorfields, by Mr. Henry Adams, M. Inst. C.E., on Wednesday evenings, commencing 16th January, 1884, at six p.m.

The Wards of the London Fever Hospital, described and illustrated by us a fortnight ago, have been supplied with blinds by Messrs. Gwynn & Son, under the direction of the architect, Mr. Keith D. Young.

TENDERS.

For public swimming and other baths at Ladywell, for the Commissioners of Baths and Wash-houses for the parish of Lewisham. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India Avenue, Leadenhall-street, E.C. Quantities supplied:—

Priestley	29,800 0 0
Martin	9,380 0 0
J. & C. Bowyer	9,215 0 0
Stafford	9,142 0 0
Marshall	9,086 0 0
Joselyne	9,081 0 0
Redman	9,043 0 0
Shurmut	8,900 0 0
J. Mowlem & Co.	8,583 0 0
Nightingale	8,988 0 0
Howell	8,450 0 0
Olley	8,411 0 0
Jerrard	8,403 0 0
Holloway	8,276 0 0
Foster & Dicksee	8,174 0 0
Hobbs	8,060 0 0
D. D. & A. Brown	8,025 0 0

For public swimming and other baths at Forest Hill, for the Commissioners of Baths and Wash-houses for the parish of Lewisham. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India Avenue, Leadenhall-street, E.C. Quantities supplied:—

Priestley	29,100 0 0
J. & C. Bowyer	9,395 0 0
Joselyne	9,311 0 0
Stafford	8,486 0 0
Hall, Beddall, & Co.	8,437 0 0
Marshall	8,338 0 0
Mowlem & Co.	8,270 0 0
Nightingale	8,233 0 0
Shurmut	8,090 0 0
Jerrard	8,031 0 0
Howell	8,021 0 0
Redman	7,994 0 0
Holloway	7,847 0 0
Olley	7,799 0 0
Hobbs	7,749 0 0
Jones	7,675 0 0
Foster & Dicksee	7,575 0 0
D. D. & A. Brown	7,177 0 0
Martin	7,015 0 0

For the erection of new parish rooms, Rotherhithe, in connexion with St. Bartholomew's Mission. Mr. W. Ravencroft, architect, Reading:—

Smith & Barnes	22,929 0 0
Rider & Son	2,888 0 0
Staines & Son	2,884 0 0
Searle	2,575 0 0
Bottrill, Reading	2,788 0 0
Lawrence & Son	2,611 0 0

For supplying and fixing speaking-tubes and electrical bell communication at the new Parish Offices, Birmingham. Mr. W. H. Ward, architect:—

Radcliffe	£410 0 0
Vulcan Manufacturing Company	335 0 0
Smith & Sons	335 0 0
Norand	276 0 0
Sidler	210 0 0
E. Hill (accepted)	199 8 0
Shepherd	70 0 0

For supplying and fixing seven iron doors at the new Parish Offices, Birmingham. Mr. W. H. Ward, architect:—

Tann & Co.	£185 0 0
Whitfield & Co.	147 0 0
Smith	117 0 0
Hipkins	133 0 0
Wood & Co.	127 15 0
Taunt	122 10 0
Clark, Bunnett, & Co.	120 0 0
Talbot	119 0 0
Cotterill & Co.	115 10 0
White	115 0 0
Lucas & Co.	113 10 0
G. Price (accepted)	103 0 0
Withers & Co.	101 10 0

For granite for the Finchley Local Board. Mr. George W. Brumell, surveyor:—

Name.	Description of Granite.	Per Yard Run Laid, 12 by 6 ft. Granite Kerb.		Per Yard super. laid, 7 by 5 Granite Channelling on 6 in. Concrete.	
		Straight.	Circular.	Straight.	Circular.
Geo. Dixon.....	Cornish.	8. 0	8. 0	8. 0	8. 0
Rowland Brothers.....	Cornish.	7. 9	8. 3	14. 0	14. 0
McKenzie, Williams, & Co.....	Pennant stone (not laid).	4. 2	5. 3	18. 0	18. 0
Pennant Stone Company.....	Cornish.	5. 0	7. 6	—	—
James Dixon.....	Cornish.	5. 5	6. 10	17. 0	17. 0
McKenzie, Williams, & Co.....	Cornish.	5. 9	6. 6	14. 0	14. 0
E. Tildesley.....	Cornish.	4. 11	5. 5	13. 9	13. 9
J. S. Gabriel * Belvedere-road.....	Cornish.	4. 2 1/2	4. 11 1/2	11. 0	11. 0
Nowell & Robson.....	Cornish.	5. 0	5. 8	11. 3	11. 3
James Bloomfield.....	Cornish.	5. 3	6. 0	10. 0	10. 0
W. Lloyd.....	Ordinary Cornish. Extra dressed, do.	4. 7 1/2 4. 10 1/2	5. 11 1/2 5. 4 1/2	11. 3	11. 3
H. F. Brooks.....	Norway.	8. 4 1/2	7. 0	—	—
J. Mowlem.....	Cornish.	5. 4 1/2	6. 0	13. 0	13. 0
Wheeler & Hindle.....	Cornish.	5. 1	5. 10	13. 0	13. 0
P. Aspinall & Son.....	Norway.	5. 0 1/2	5. 1 1/2	12. 9	12. 9
J. Bell.....	Cornish.	4. 10 1/2	5. 4 1/2	13. 6	13. 6
	Norway.	5. 1 1/2	5. 7 1/2	13. 6	13. 6
	Cornish.	5. 4	6. 7	13. 6	13. 6

* Accepted.

For new cricket pavilion to be erected in the Central Recreation Ground, Hastings. Mr. Arthur Wells, architect, 25, Haylock-road, Hastings:—

H. Friend, Hastings.....	£1,285 0 0
W. J. Rodds, Hastings.....	1,150 0 0
Taylor Bros., Hastings.....	1,120 0 0
Foster & Dicksee, Rugby.....	1,110 0 0
P. Crautenden, Hastings.....	1,064 0 0
T. Wren, Hastings.....	1,069 0 0
A. Vidler, Hastings.....	1,043 0 0
J. Howell & Son, Hastings.....	986 0 0
W. Stace, Hastings.....	986 0 0
B. Foster, Hastings (accepted).....	852 0 0

For supplying and fixing a lift at the new Parish Offices, Birmingham. Mr. W. H. Ward, architect:—

Barnes & Co.....	£124 0 0
Haas & Singleton.....	120 0 0
Cassier & Co.....	110 0 0
Hodkinson & Clarke.....	81 0 0
Waygood & Co.....	78 5 0
Thomas & Sons.....	56 10 0
Clare, Bannett, & Co. (accepted).....	45 0 0

For rebuilding premises, Castle-street, Cambridge, for Mr. F. Bailey. Mr. Frank Waters, architect. Quantities supplied:—

A. Eyo.....	£723 10 6
W. Saint.....	654 0 0
M. Christmas (accepted).....	644 0 0

For the erection of a new building in Coventry-street, Haymarket. Mr. William Wimple, architect:—

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Dove Bros.....	12,745 0 0
Kirk & Randall.....	12,640 0 0
Ashby & Horner.....	12,596 0 0
Bangs & Co.....	12,420 0 0
Killy & Gwyford.....	12,343 0 0
Schreiner & Co.....	12,180 0 0
Brass.....	12,189 0 0
Lawrence & Sons.....	11,916 0 0
Baylis.....	11,914 0 0

For the whole of the constructional work in the new Artisans' Dwellings at Petticoat-square, for the City Commissioners of Sewers. Colonel Haywood, City Engineer:—

Stanley, Hall, & Co. (accepted).....	£6,050 0 0
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nership his son, Mr. W. W. BARBER and Mr.

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The Builder.

Vol. XLVI. No. 2196.

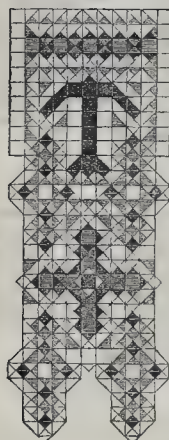
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The Water Requirements of London.

HAT the decision given in the case of Mr. Dobbs might lead the water-consumers to take some steps towards what we have ventured to suggest as the true mode of solving the water-supply question, the appointment of a committee of water-consumers for mutual defence, was our suggestion in previously commenting on the case; and therefore we were not surprised later the report of a

public meeting of the Water-Consumers' Defence League, in support of the movement having for its object the formation of branch Committees of the League throughout the metropolis.

Let us hope that, in the present case, the league will not be formed on narrow lines. If so, a great opportunity will be missed. The great motor power of the *argumentum ad crumenam*, the defence of the pocket, has been set going. But if the movement thus set on foot be restricted to the endeavour to keep down the water-rates, it will neither meet with the sympathy, nor possess the vitality and permanence, with which it may be invested, if the League take for their motto the words "Ample, pure, and cheap water." By "ample" we do not mean unrestricted, but proportionate to the real wants of districts and of individuals. "Pure" speaks for itself, or is easily to be defined; and "cheap" means as cheap as possible for an ample and pure supply, under the guarantee of the public faith. If the Water League "go in," as the phrase is, for such a supply, and if their counsels are sound, sage, and well advised, they may attain a degree of public confidence that will give them more authority in the matter, and power more thoroughly to serve the metropolis, than either the Metropolitan Board of Works, the Government, or the private speculators of previous years, have ever managed to acquire.

At the present moment it may be of service to the organisers of the League, or, at all events, it may be of service to the inhabitants of London, to block out, briefly and roughly, the features of the great problem which demands solution.

The "Greater London" of the Registrar-General's returns, which is equivalent to the Metropolitan and City of London police districts, has an area of 446,494 acres, or 697 square miles. In 1881 it contained a population of 4,764,312 souls, living in 645,818 houses, the growth of which population in the past decade amounted to 22·6 per cent., and in the last twenty years, to 47·8 per cent. Of this large area, 341,063 acres are included within the statutory or presumptive districts of eight independent companies, who, five years ago, had laid out on land, works, and contingent expenditure, for the supply of an area of about 250 square miles, the aggregate sum of 11,614,179*l.*, which has subsequently been raised to 13,000,000*l.* in round numbers. The gross total of their revenue, from all sources, in 1876, was 1,248,116*l.*; their expenditure in maintenance, distribution, pumping, and all needful outlay, was 492,319*l.*, leaving a profit of 755,797*l.* This profit was variously stated as interest, dividend, or reserve; but, taken roundly, it was equal to a net earning of 6·58 per cent. on the expended capital. Since the dates given, these figures have grown, as we may hereafter show. But there may be an advantage in citing, in the first instance, figures that were elaborately analysed before the changes wrought by the introduction of the various abortive attempts to disestablish these existing companies. The calculation thus made, taking three per cent. Consols at 95, made the par value of the capital earning the return equal to 24,225,564*l.*

The water supplied by these companies, from 1869 to 1877 inclusive, was at the average rate of 32·77 gallons of water per day, per head of population. The march of opinion is to the effect that this supply is too high, rather than too low, and that by the introduction of constant service, and, still more decisively, by the introduction of any feasible mode of payment on actual consumption, the demand per head may be very seriously reduced, to the advantage of all parties. While 53·5 tons of water per head per annum was the mean delivery, the quantities supplied by the different companies ranged from 44·1 to 62·4 tons per head per annum. It may be thought that the service of manufactories had much to do with the difference, but this is hardly consistent with the fact that in East London, where the cost of water per ton delivered is 50 per cent. below the average, the supply per head is 4 per cent. below the average. It must, therefore, be regarded as probable either that there is an undue supply in the one district or that there is great waste in the other. These are matters demanding careful investigation; and are enough to show that any jump at an average charge, applicable

to the whole of London, would create widespread discontent.

The actual cost of service and delivery varies considerably in the different districts. The East London and New River Companies, supplied by streams that rise at a higher level than that of the Thames where it is tapped by the Water Companies, pay less than half the cost incurred by the latter for the item of pumping. This is a natural advantage, of which it would be altogether unjust to attempt to deprive the districts so far favoured by position. Again, the outlay of capital by the companies varies from 17*l.* to 38*l.* per house, and from 2·27*l.* to 5·20*l.* per inhabitant served, an outlay which it would be quite unjust to charge all round as an average.

A careful analysis of the accounts of the water companies leads to the conclusion that the average price of three-halfpence per metric ton of water delivered in the houses, which allowed, in 1877, a mean net profit on capital, taking shares and loans together, of 6·58 per cent., is not likely to be materially reduced by any means that have been hitherto suggested. Where gravitation comes in aid, and where the cost per house of works and fittings, has been the lowest, the figure comes down (within a fraction) to a penny per ton. Where there is much pumping, together with costly works and fittings, the cost of twopence per ton is slightly exceeded. In any just measure for checking or reducing the charges of the water companies, these controlling features must be borne in mind. It may be thought, in the first instance, unfair that while an East London consumer is only charged 4*s.* 4*d.* a year for water, a West-end consumer should be charged 8*s.* 6*d.* for a supply which, though larger, he has no power to limit. But apart from the reform of charging by meter, or in some other way interesting the consumer in the economical use of water, it is hard to see how these disparities are to be materially altered. Of course, these remarks do not apply to that increase of 24 per cent. in water rental, since 1877, which has accompanied an increase of only 11·6 per cent. on the capital expenditure. These are figures on which the formation of a water-consumers' defence league is *prima facie* justifiable. All on which we now insist is, that the rates of each company should be judged on the actual circumstances of each; and that when the consumer is spoken of, we must remember that there are different classes of consumers, or, rather, that the local cost of supply is in every instance, to some extent, a local question.

Local peculiarities, in fact, dominate the whole problem. Without reverting to either of those prodigious and questionable schemes which proposed to tap the sources of the

Severn, the Dee, or the Eden, and to create a new and most costly "New River" to quench the thirst of London, we are limited to the area of the basin of the Thames and its affluents, visible or underground, for providing the water supply of the metropolis. This basin covers an area of 3,300,000 acres, the average rainfall over which has been variously estimated at from 25 to 27 inches in the year. The lowest annual fall recorded was in 1832, being 16.1 inch. And if we take Teddington as the point of intake for supplies drawn from the river, we have to decrease the area of collection to 2,300,000 acres. On this surface, in the dry year 1832, four milliards, that is to say four thousand millions, of tons of rain fell, according to the gauge. How much of this is evaporated, absorbed by vegetation, or otherwise prevented from reaching the river, is unknown. The Royal Commission on Water Supply say one-third; Mr. Harrison says one-sixth; Mr. Bailey-Denton says three twenty-fifths run down the channel. If we take gauggings of the Thames for our guide we are led to the conclusion that a population of 7,000,000 souls would require to be supplied with nearly half the minimum summer flow of the Thames. If we suppose that 16 in. of rain could be collected and stored without loss from the 341,000 acres of the Water Companies' districts, it would provide, not merely 50, but 78 tons per head per annum for 7,000,000 of people.

We have not hesitated, on former occasions, to express the opinion that the failure to make direct use of the rain-water is a scandal to chemical science. Fifty years ago rain-water was almost everywhere collected from the roofs of houses; and, although not used for drinking, was available for other domestic purposes. The two facts which have revolutionised this state of things are, the delicate absorbing power of water, which enables it to collect all kinds of impurity, not only from actual contact, but from the air itself, and the enormous increase of population. To the latter are due, first the increase in smoke, soot, blacks, and injurious acids which the rain washes from the roofs, and secondly, that of the vaporous compound of the invisible results of the vital process, which is chiefly perceptible as evil smells. Of these two, visible and invisible pollution, the first is the least mischievous. It speaks for itself, and not only deters persons from using rain-water, but has led to the disuse of rain-water collecting apparatus. But the second, which is the most subtle and imperceptible, is also the most deadly. There is little room to doubt that the germs of some of the most terrible forms of disease are conveyed, or perhaps fertilised, by the gases. It is well known to those who have studied the subject that a cistern kept full of water, and protected from the entrance of impure water, will, in a comparatively brief time, show a deposit of foul mud if it is exposed to those unwholesome vapours which are usually found in the vicinity of our water cisterns. Thus, in keeping out soot and "blacks," we only half protect our potable water; and the half evil so avoided is the least dangerous half. It is becoming a recognised need of the future either to take some efficient means for protecting the domestic cistern, or to abolish it altogether by the use of constant service. But however far this may be carried out, the importance of some chemical mode of restoring the purity of water cannot be doubted. In 1877, out of an estimated street mileage in London of 1,460 miles, 711 miles, or nearly one-half, contained mains constantly charged, from which constant service was practicable. The present street mileage can hardly be less than 1,600 miles; and Colonel Bolton's latest official report gives a length of 903 miles of constantly-charged mains. This shows an advance; but it also shows that it must be long before we can anticipate the general abolition of the main cause of the impurity of "pipe-water," viz., the domestic cistern. Chemical aid would be welcome over at least 700 miles of London streets, and the expedients which would make the water of the cisterns fit for human consumption, would go very far to perform the same office for rain-water. Sooner or later, we feel convinced,

science must grapple with the problem; and the sooner this is done the better for the water supply of the future.

Failing this aid on the part of the chemist, it is obvious that, year after year, we are more and more bound to make the best of all existing sources for the water supply of the metropolis, in face of a steadily increasing demand. Four and a half millions more tons of water, be it remembered, in round figures, will be required by the thirsty population of "Greater London" in 1884 than was provided in 1883. That is to say, that year after year we require the addition of a supply of water equal to that of a spring yielding thirty gallons per second for the entire year. Facts such as this have no ordinary significance. Whence is the supply to come?

From the basin of the New River and the river Lea it may be estimated that a daily influx of 200,000 metric tons of water, drawn from the present sources, and flowing through existing channels, may be relied on. This provides for about 1,400,000 souls. From the chalk springs, north and south of the Thames, a further supply of about the same amount, say 180,000 metric tons of water per day, is estimated as attainable. These two sources, then, may be looked to as providing for the supply of 2,750,000 souls. Four millions and a quarter of inhabitants, requiring 707,000 metric tons of water per day, have yet to be provided for; and, failing any direct utilisation of the rainfall of the district, have no source of supply but the Thames and its affluents. And the quantity of water thus required is equal to about half the summer flow of the Thames at Hampton, which Mr. Beardmore estimated at 1,435,000 tons per day. In the summer, moreover, when the river is lowest, the demand for water is the largest, and at present rates will exceed 800,000 metric tons per day.

Here the question of river purity assumes commanding importance. The abstraction of so large a portion of its flow from the Thames above London, to be returned to the river at Barking, must effect a great change in the régime of the river. The quantity now so diverted is not quite a third of the future requirements. The abstraction must lead to the ascent of a larger body of sea-water in the channel of the river, and, unless the disinfection of the outflow at Barking be then accomplished, there will be extreme danger of pollution. At the same time the population of the Thames valley will increase, not, perhaps, with the phenomenal growth of the metropolis, but at a rate above that of the country at large. And this increase, unless we have turned over a very new leaf as to the action of the local sanitary authorities, will mean increased pollution of the river. Thus, with an ever-increasing demand in quantity, made upon a service yearly becoming more doubtful as to quality, the water-drinker has, indeed, to inquire what protection he can obtain from the chemist.

From this glance at the controlling features of the London water supply it will, we trust, be seen how much cause exists for anxiety that the new association should not be allowed to drift into the position of a mere opponent of undue rating. That rating has been undue there is now no question; and that such injustice is best to be encountered by the co-operative principle of mutual support may be at once admitted. But the incidence of rating is controlled by law, and it is only necessary to set the law duly in motion to prevent abuse. This, however, is but a small part of the ever-growing problem of the London water supply. It is because there is a real *raison d'être* for an association of water consumers that we think it possible that such a body may effect more towards the settlement of the main question than has been effected, or even attempted, by the costly bumbles of the last seven years. The remarkable blunder of the Registrar-General in 1876, severely commented on at the time, to the effect that by appropriating the property of the gas and water companies by the State, the "ratepayers might be supplied with gas and water at half the present cost," seems to have given the signal

to every one who could construct a crotchet to do so at the expense of these companies. One very comprehensive plan for what it is, perhaps, hard to call anything but spoliation, was brought to an abrupt end by the award in the Middlesbrough water-supply case, which showed that it must cost more forcibly to dispossess the holders of this kind of property than to let them alone. Of the proposals of the late Government we spoke without hesitation at the time when they were brought forward. Well meaning, no doubt, they were, but based on a total and contented ignorance of the full outline of the case. The proposals of the Metropolitan Board of Works for a double supply would have loaded the ratepayers with a needless and intolerable burden. And of late the question seems only to have been regarded as a crying injustice, the persistent disregard of which might be used as a lever to effect other changes in London. Of the iniquity of attempting to trade on one of the great necessities of human life, either for personal greed or for political and party ends, it is difficult to express too emphatic a condemnation. But our habits and institutions do not admit of that mode of dealing with the question which would be adopted by most civilised people. Neither the speculator nor the politician will take the pains to go to the root of the matter. It requires that strong sense of the importance of so doing which is developed by feeling where the shoe pinches, to induce any one to take the trouble to understand so complex a question, or to take the counsel of those who have taken that trouble. It is one thing to produce a scheme that will float on the market, that will pass the easy ordeal of House of Commons criticism, or that might add to the power and importance of an overgrown Board,—and quite another to ascertain how, with due regard to existing proprietary rights, the London of 1901 is best to be watered. To attack the subject on a more narrow ground than that indicated by these last words will be only to trifle, to "job," and, into the bargain,—to fail.

THE LOAN EXHIBITION AT BURLINGTON HOUSE.

In spite of the immense wealth of this country in paintings, there is manifest evidence in this year's collection that the available sources for the highest class of exhibition of this kind are coming to an end. The interest of the exhibition is certainly not equal to any that we remember of its predecessors. There are some exquisite works, and some of remarkable interest, but there is a large proportion of works by the masters of secondary order, and some works of decidedly secondary order by great masters. To many it will seem to fall in more flat by contrast with the great interest which was excited last year by the collection of works of such strong and marked individuality as those of Rossetti, which were also to many visitors so little known. As to the real value of that collection we expressed our opinion on that occasion; an opinion, as we observed, at variance with many written judgments on it, but very much in accordance with much of that spoken judgment which does not find its way into the press.

Although thinking that Rossetti's value was much over-rated by critics, many of whom were his personal friends, or the friends of his friends, we can yet hardly pretend that there is the same vivid interest attached to the collected works of the modern English deceased painter who is this year specially represented at Burlington House. Many of the works of Poole, which are hung in Gallery V., are such as do not represent his peculiar genius, and are striking chiefly as showing how very Academic, in his earlier works, a painter could be, who became so poetic and original in style in his later productions. The contrast between the earlier and later works is, indeed, so marked that in feeling and aim they scarcely seem like the productions of the same mind. Poole started in his career as an "historical painter," producing works of very serious aim filled with many figures; very carefully composed,

but so obviously so as to seem theatrical in effect. This defect was more common at the time than at present, when the fault is rather in the direction of a too great endeavour after realism; but it is very marked in the most elaborate works of this period, "Solomon Eagle" and "Job" (289, 291). In the former the lunatic prophet steps forward between a crowd of people who seem arranged in the street to see his entry, as systematically as "supers" are arranged on a stage for the effective entry of the principal actor as the central figure. This is carried so far that all sense of the real horror of the scene in the height of the London plague time is lost; it is merely an artificial grouping, which leaves our sympathies quite unmoved. In the picture of the messenger relating to Job the slaughter of his servants by the Sabæans, which is very effectively grouped and finely drawn, there is the same staginess; the various actors lift their hands simultaneously at the proper moment in conventional expressions of surprise; the messenger is quite composed in his demeanour. Compare this with the little drawing in Blake's Series, and there is the distinction between talent and genius. These two works are dated 1843 and 1850 respectively; and had Poole painted only in this style, his works would not now be hanging in a separate room at Burlington House. His real genius arose later in his life, when he developed his feeling for romantic and ideal landscape, treated in a highly poetic spirit, and expressing in many cases a special and defined idea helped out or commented upon by some ideal figures which seem to blend with his wild imaginary scenes both in colour and sentiment. This combination of the sentiment of landscape and figures may be called "idyllic" in the works of such artists as Mason, for example; the word would not suit Poole, because the feeling is deeper and more melancholy than any we usually connect with that phrase. If we coined a word for his genius, we should call him a Spenserian painter; his rich and romantic landscapes seem to be the very scenes for the mythical personages and actions of the "Faerie Queene," which he occasionally illustrated, and which we wish he had worked more upon; it affords a mine of subjects which have been little heeded, perhaps because they require a special power and sympathy to translate into painting with any hope of success. Probably the finest and most typical of Poole's works in what we regard as his real style is "The Seventh Day of the Decameron" (300), hung at the top of the room. It is noticeable that this is almost the earliest work of his in this style; perhaps its great success gave the subsequent turn to his genius. It was painted as early as 1855, and well do we remember the impression it made on us on first seeing it at that time. The colour of the scene is not "the light of common day"; it is bathed in a mystic light of its own; and the figures, clad in draperies the rich yet subdued tints of which harmonise with the prevailing tone of the landscape, sit or recline listening to Filomena's song, with an expression of calm and half-melancholy musing, in keeping with the whole feeling of the work. There is no inharmonious note in it. It is the painting of a dream, and one of the most pleasing dreams that any modern painter has given us. As Poole advanced in years the figures more and more recede from his ideal landscapes, till, in one of the latest, the "Dragon's Cavern" (291), painted in 1877, the figure has almost disappeared, and he gives poetic interest and expressions through landscape alone. We do not see the dragon, but we are very well prepared to except anything uncanny to dwell in that threatening and inaccessible hollow in the side of the hill. Similarly, in "A Lion in the Path" (309), exhibited in 1873, the landscape, as we think we remarked at the time, is pervaded by the angry and threatening expression which the title suggests. The lion himself is not much, and would cause little concern if not backed by this lowering landscape. On works of this class Poole's reputation rests, and they are not only fine in themselves, but significant as a kind of reminder that there is such a thing as poetical work in landscape-painting, of which we see little now. But

Poole's really great works were few, and of the small collection here (twenty-seven in all) some had been, perhaps, better omitted.

Among the older works which are most remarkable for pure beauty, independent of historical or educational interest, two in particular may be singled out, Romney's "Mrs. Maxwell" (197) and Gainsborough's "Nancy Parsons" (214). The former, which may have been touched up or cleaned in the draperies, but not to such an extent as to mar its effect, is a noble example of Romney's dignity and grace in feminine portraiture,—a full-length of a beautiful brunette in a white dress, set off by an orange silk scarf drooped behind her, leaning her head on one hand by the side of the usual pedestal. Romney, indeed, never gives us the brilliant originality of colouring which distinguishes Reynolds, his inferiority to whom in this respect has been hardly sufficiently recognised; his combinations, though effective, are of the more common and obvious order; but in drawing and expression, and his manner of posing his figures, he runs Reynolds and Gainsborough hard when at his best. He never, however, attained to such delicacy of colour and modelling of features as Gainsborough in such a work as the "Nancy Parsons," a face of the most exquisite and delicate beauty both of features and expression; remembering the social status of Nancy, it is difficult not to suppose that Gainsborough refined on his model, and that to him is owing the gentle, ladylike, and refined expression which seems strangely out of keeping with what one would expect to find in such a personality. In strong contrast with this is the downright and powerful work of Velasquez, on the opposite wall, "The Corregidor of Madrid" (153), a portrait betraying a latent sarcasm on the part of the painter against the pedantic and self-important officialism of his sitter. Among the other Gainsborough portraits, one of the best is a small half-length of "Canning as a Young Man" (36), a very carefully-finished head, the youthful softness and bloom of which (for it is that of a boy rather than a young man) seems intentionally emphasised by the rather thick and sketchy treatment of the white cravat. His full-length of the "Rev. Sir Henry Bate Dudley" (203) is not only a fine portrait, but illustrates what we said in our last about Gainsborough's animal painting: the dog is capital. Among the Reynoldses of the collection is one of the repetitions of "Hope nursing Love," of which another was in the Loan Exhibition of 1877; this is inferior generally to the other example, but better in the painting of the head of the principal figure, which in the Earl of St. German's picture is a good deal like a star-fish. The "Ino and Bacchus" hangs as a pendant to it, hardly one of the most satisfactory among Reynolds's works, though very rich in colour. His most characteristic example in the collection is the beautiful Mrs. Sheridan as "St. Cecilia" (209), a lovely but very quiescent Cecilia, seated, and accompanied by cherubs. Apparently this must have been one of Reynolds's fine and original works as to colour, but what colour the draperies, &c., really were when the work was first painted it would be hazardous to say.

The distinction between portrait which is mere portraiture, and portrait which is the work of genius, could hardly be better exemplified than in Lely's "Portrait of a Man" (126), and Rembrandt's head, also called a portrait (119). The latter is full of force and power; the former is a representation of a head, and that is all. The Italian portraits in the collection are few, and not of the highest order. Tintoretto and Antonio More figure among the names, but not at their best. Reynolds's portrait of Gibbon, belonging to the Earl of Sheffield (39), is an obviously good likeness, too full of character to be otherwise; and the half-length portrait of "Lady Sarah Banbury" (31) called by Mrs. Piozzi "gloriously handsome," but remarkable even more for the interest and expressive originality of her countenance, is one of the happiest specimens of Reynolds's portraits of the ladies of his day. Zoffany's portrait of "Garriek as Sir John Brute" (55), and "Macklin as Shylock"

(54), the latter including a portrait of Lord Mansfield as the judge in the trial scene, have interest and spirit; the expression of Macklin's face is admirable, and gives a clear indication as to his general reading of the character of Shylock, though it is a somewhat coarse performance.

Rubens's great, flaunting, powerfully-drawn, allegorical picture of the "Glorification of a Prince of Orange" (150), one of those paintings in which the movement is carried on in a receding perspective, so that we have a view of the soles of the feet of the hero as he is drawn or shoved upwards by fat angels and other gross spiritual beings, male and female, occupies part (a very large part) of one end of the long gallery. It displays great qualities of drawing and foreshortening of plump and ruddy nudités, after the manner of the Amsterdam master. Among the lesser Dutch pictures, less in size, but certainly not in merit, there is a good Ostade belonging to Earl Howe, exhibiting that "delicious brown tone" on which Sir G. Beaumont commented to Wilkie in looking at one Ostade, only to receive the reply, "Ra-ally, I think I see Prussian blue in it," Wilkie having a Prussian blue mania at the time. Terburg's "The Letter" (122), lent by the Queen, has the same elements as his other variations on the same theme; in this case, the young woman standing has her side face to the spectator. The interest in these works of Terburg's is partly, perhaps, in their very vagueness of subject; his colour is usually fine, and his figures are nearly always dignified and of marked character, and the pictures become like outline scenes of a novelette, which the reader may fill in according to his fancy. Earl Howe's "Cuypp" (129) is a fine specimen, notably for the beautiful painting of the middle-distance landscape, with its quiet "brimming river" reflecting the equally quiet craft in its waters. Among the portraits is one of the "Baroness Dacre" (66), by Greuze, and another Greuze, interesting as being rather out of his usual line, "The Miser," (110), expressive though repellent head. Metzu's "Pleasures of Taste" (111), lent by the Queen, and Teniers's painting of the interior of his own studio, may be mentioned as among the more interesting of the Dutch paintings of this class.

Among the landscapes special attention seems to have been directed towards getting some good representation of Richard Wilson, by whom are several fine works, among others "The Villa of Mécenas" (45), a painting with greater variety of incident than is usual with Wilson; and "The Falls of Tivoli" (202), the composition of Claude, translated into the colouring of Wilson; "The voice is Jacob's voice, but the hands are Esau's." Of Claude himself there are one or two fine specimens, the largest of which is "Philip baptising the Eunuch" (167), a very lovely composition, into which Claude has introduced not only the character of Italian landscape, in spite of the title, but one of the ruined Classic buildings which he forgot were new at the time which his title indicates; in so simple-minded a manner did he put aside the unities. It would be a distinct gain to the picture if the chariot and nondescript horses were painted out. One of the finest landscapes in the galleries is Lord Scarsdale's, large Cuypp (93), very Claude-ish in composition, and with less importance given to figures than is usual with Cuypp; the warm golden glow over the hills in the middle distance is very enchanting, but certainly not natural. A large Wynants has been hung over this, with remarkable effect of contrast, showing forcibly what a matter of "personal equation" of the artist landscape-painting really is; for these two paintings should be scenes in two different planets, one would suppose, if they were regarded as representing natural effect *per se*, instead of nature-strained through the temperament and artistic proclivities of the painter. This view might be further illustrated by Rubens's grand bold sketch, rather than picture, called "Atalanta and Meleager pursuing the Caledonian Boar," but in reality a tumultuous mass of forest foliage swaying with the wind, and painted with great

force as far as the general representation is concerned; details of any special kind of tree growth there are none; the figures are with difficulty disentangled from the foreground. Two small landscapes by Gainsborough and Richard Wilson respectively are hung as pendants in the first room (29, 33), and form an interesting study of opposite qualities of style, in which Gainsborough certainly has the best of it. The large gallery contains a group of architectural paintings by Guardi and Canaletto, representing some of the best qualities of both painters.

The fourth room, in which, as usual, the early Italian and other pictures are placed, contains little that is of great interest, except historically. The minor names are mostly represented; there are a good many that are only labelled "School of —." There is a fine bit of Oregana (227), and a powerfully-painted decorative "St. George" (237), by Crivelli. A collection of six portrait heads, no artist's name (248, 50, and 251—6), each with a stone arch on terra-cotta moulded impostas as a background, is one of the curiosities of the collection. Mr. Fulleylove's "Venus and Bacchus" (260) is named only "School of Poussin," but is a powerful bit of work, whether original or not; and beneath is a little Carlo Dolci, "St. Sebastian" (258), on a small scale, in which the painter's effeminacy of style does not strike one so much as in his larger works, and which at least has the merit of being in its way beautiful, among a good many things which are only curious.

THE ENFRANCHISEMENT OF LEASEHOLDS, AND COMPENSATION BY LANDLORDS TO TENANTS FOR IMPROVEMENTS IN DWELLING HOUSES.

WHEN the Leaseholds Enfranchisement Bill was introduced into the House of Commons last year we made some observations upon it. It was not debated, however, during last Session, and consequently, from a Parliamentary point of view, was wholly still-born. Its chief promoter, Mr. Broadhurst, M.P., has, however, recently been calling public attention to it, and it is evident that it will again be introduced into the House of Commons, and under more favourable auspices will very likely obtain the honour of a debate, and of a rejection on its second reading. But however much its authors may point out the evils of the leasehold system in large towns, a system which we have always regarded as objectionable, yet we are unable to alter the opinion which we have already expressed that this measure is one which would be quite impracticable in its working. We would gladly welcome any plan by which the leaseholders of our large towns could become the owners of their habitations, for we have no doubt that nothing would conduce so rapidly to the improvement of the sanitary state of our houses, as well as to that of their beauty and convenience as dwellings, as the obtaining by the occupiers of the freehold of their homes. In fact, that the vast majority of the householders in our large towns have no permanent interest in the structures in which they live is fatal, as all experience of human nature and society shows, to the improvement of dwellings. There are other social and even political effects attending on this present system which it would take too long to enter into in detail here; but the absence of permanency in dwellings depresses and diminishes local feeling and political interest in particular localities. It may be taken for granted that nine-tenths of the London householders have scarcely any local interests, as the words would be understood in the provinces; and, though it would be erroneous to lay this down wholly to the existence of the leasehold tenures, yet there can be no question that it is very largely due to them, for few persons indeed regard their particular house as their permanent home. That this result is not a little due to this system is made clearer when it is borne in mind that tradesmen and those

with some actual local connexion are the chief representatives of a locality in the London vestries. In their case any uncertainty as to their homes, if they do not reside at their place of business, is counterbalanced by the certainty that the latter is fixed, and, consequently, there at once arises that local feeling which must be at the bottom of any real local interest.

But to return more particularly to the measure in question, the difficulty of enfranchising leaseholds by means of a compulsory sale is that it is impossible to draw a line as to where the exercise of the power in question shall cease. An example will make this plain. Suppose an occupier has a twenty-one years' lease from a builder and that this Bill had become law. The occupier, having made arrangements with the builder (his immediate landlord), purchases his interest in the house. The occupier has then the remainder of a sixty years' lease from the freeholder. Under the provisions of the new Act, the occupier, as we will still continue to call him, goes through the forms under the Act and compels the freeholder to sell him his house, of which he thus becomes the absolute owner. He is pleased with his investment, and thinks with satisfaction that when he dies his widow and children will have a permanent home improved and beautified by his expenditure and taste. Circumstances, however, cause him to leave London, and he lets his house on a twenty-one years' lease. To his surprise his new tenant, who, after six months' residence, is pleased with the dwelling and wants to invest some money, serves him with notice that he must sell it compulsorily, and, whether he likes it or not, sell he must. This example shows, we think, the impracticability of this scheme, for, to use a rather vulgar saying, "what is sauce for the goose is sauce for the gander." For it is impossible to draw the line between the freeholder whose tenant has the tail end of a sixty or a ninety-nine years' lease and the freeholder whose tenant has fifteen years to run out of a twenty-one years' lease. Nor, again, if the freeholder is to be bought out, can the leaseholder who is intermediate between the freeholder and the occupier, who pays a ground rent and grants sub-leases of twenty-one years, very well escape. The reasons which make it advisable that the occupier should become the absolute owner in one case are equally full of force in the other. Of course, we all know that the great ground-landlords in our large towns are the persons chiefly aimed at by this Bill, but we again repeat you cannot schedule fifty great landowners in a Bill and allow their tenants to buy them out, and still leave the smaller landlords and their tenants on the same footing. There is also this further objection, as we pointed out last year, that if every leasehold tenant has the power to buy out his landlord, the result must inevitably be to do away with leases altogether; and it must be obvious that it is both convenient and right that many houseowners should be able, if necessary, to let their houses upon leasehold terms. Moreover, there is the further broad question whether the public interest so urgently requires the compulsory buying out of ground-landlords that the Legislature will sanction the introduction of a principle which has hitherto only been allowed when the necessity for it was quite certain.

But it may be asked, admitting, as we do, the evils of a leasehold tenure, on so large a scale as exists in many towns, and more especially in London, is there no remedy to be applied? We confess we see no reason to suppose that any immediate and drastic remedy is possible, the change can only be effected by certain factors working indirectly and producing their consequences by degrees. Foremost among these factors must be placed the Settled Land Act, which, without doubt, will in time help to distribute the largest estates, among a larger number of hands, especially those of which personal enjoyment is impossible. But this Act must necessarily produce its consequences slowly; owners of property must first get accustomed to the idea of it at all, and then it will usually require some outside cause to set

its machinery in motion. We confess, too, that some plan appears to be necessary by which ground-landlords, and in fact all landlords, should bear some part of the local burdens, seeing how much they benefit by particular localities. If we consider the immense sums which the railway companies, for example, contribute to local funds, it is absurd that landlords who benefit so largely from localities should simply draw their money and pay nothing towards local burdens. It may be said that if landlords are taxed they will get the money out of their tenants; but though this may be partially true, yet the moral effect of making landlords who simply draw money feel that they must bear some part of the burden is great; moreover, it is not always necessary that tenants should agree to be the actual payers of the tax, and if it were collected, say as a percentage on the rent, the larger amount of rent the landlord asked, the larger would be his contribution.

But there is a further measure which is desirable, having regard to the health of the community at large as well as in the interest of tenants. That is, that as between tenants and their immediate landlords the latter should be bound to pay a portion of the sums expended by the former in permanent improvements of a useful nature. The absence of any such law at present prevents many necessary sanitary and other improvements from being done by tenants, who have no means of recouping themselves their outlay, and no certainty that they will inhabit their houses for any length of time. One of the most attractive, and yet, from one point of view, disgraceful announcements which a house-agent can make when seeking to obtain a new tenant for a landlord is, that the last tenant spent large sums upon the draining, ventilating, and improving of the house, not one penny of which outlay, it is quite certain, he has ever been repaid by the landlord, although the latter makes use of those improvements to obtain a new tenant and charge him an increased rent. If it were compulsory on landlords to bear a proportion of the cost of improvements of a permanent nature, whether done with or without the permission of the landlord, the habitable condition of our large towns would be enormously improved, and an incentive to landlords to sell their houses so as to allow occupiers to become permanent owners would undoubtedly be given. It would, doubtless, be urged by opponents of this view that a tenant should stipulate by his contract that the landlord should pay something towards improvement, and, if he will not consent, not take the house in question. But those who argue in this fashion forget that in our large towns the owners of house property have now a practical monopoly, and that the competition between houseowners is, in these days, a mere fiction. It may be said that it would be unfair to a landlord to oblige him to pay part of the cost of an improvement which he considered unnecessary. We quite agree that improvements of a temporary nature, or those which might be called wholly artistic in the sense that they did not improve the habitability of the house, should be entirely at the tenant's cost; but anything which is of a permanent character, and improves the house simply as a dwelling-house, should be paid for in part by the landlord, whether he desires it or not, because it is to the interest of society in general that the habitations of the people should be made as perfect as possible, and it is wholly wrong and contrary to the interests of society that a man should be allowed to take the rent of a house and do nothing towards its improvement. If he takes the view that he would like to receive the rent, and do nothing more, the answer is that on grounds of public policy he cannot, to use a familiar phrase, have his cake and eat it. If he does not like the burdens as well as the benefits of property, then let him sell it, and cease to have either one or the other. Society is ripe for such a measure of compulsory payments by landlords for permanent improvements; but it is not, and we take leave to doubt if it

will ever be, prepared to sanction a measure of leasehold enfranchisement such as Mr. Broadhurst and his Bill proposes, since it is one which, as we have endeavoured to show, is practically unwarrantable. Let him endeavour, however, to pass a measure granting compensation to leaseholders of houses, and making it compulsory on landlords to pay part of the cost of permanent improvement, and he will be supported by a vast number of persons, and be responsible for a measure calculated largely to improve the sanitary, artistic, and what, in one word, may be called the architectural state of dwelling-houses all over England.

NOTES.

WE congratulate the Institute of Architects on having, at their annual business meeting on Monday last, untied their own fetters, and left themselves free to place at their head as President whoever may be deemed to be the leading representative of English architecture among the members, and the best able to fill effectively the important duties of a leader, instead of leaving this to a process of semi-mechanical selection by rotation. Of course, the qualifications for a good President are special, and may or may not be found united with the highest artistic attainments; but we should venture to exhort those who have power to vote in the matter at the next election to remember the first object for which the Royal Institute of Architects was founded, as set forth in the By-laws,—“the advancement of the Art of Architecture”; and to keep in mind the fact that architecture is an art, and not merely a business. The meeting having been officially private, we do not go into details, further than to remark that the large attendance and exceptional animation of some of the speakers on the occasion, left no doubt that strong interest was felt in the subject by many members who have not been among the most habitual attendants at the ordinary meetings of late years. The advisability of a more frequent change in the composition of the Council was also decisively affirmed by the meeting, though some have not, perhaps, realised the extent of change which the proposition immediately voted upon would entail. A too large and constant influx of “new blood” might lead to more fluctuation in the method and principles of conducting the business of the Institute than is quite desirable; but the principle having been affirmed, the details of re-arrangement have been left in the hands of the present Council, who will, we hope, be able to steer a middle course, to the advantage of all concerned.

THE proposed construction of a railway through the parks has much exercised the working classes of London, whose desire for the intact preservation of these great lungs of the metropolis appears to be sincere and unaffected. A deputation from the Trades Council of London had an interview with the First Commissioner of Works on the 4th inst. to inquire into the action of the Government in the matter. Mr. Shaw-Lefevre said that the Government had insisted that “the railway shall be constructed through the parks wholly in tunnel.” At the same time he admitted that over part of the archway, when finished, there would be only 6 ft., and over another part only 10 ft. of earth. In such depths it is unusual, not to say impossible, to tunnel, and the fact that the construction of the line will involve a considerable amount of open cutting, afterwards to be filled up and turfed over, is one that will have to be faced. It would have been more satisfactory if the First Commissioner had explained what proportion of the new line it would be feasible really to tunnel, and what proportion will have to be executed in the more disturbing manner against which the Government do not, after all, wholly “insist.”

THE “Art for Schools Association,” of which Professor Ruskin is president, and Miss Christie is honorary secretary, has made a kind of practical definition of its aims by

arranging, in a room lent for the purpose by the Fine Art Society, in New Bond-street, a number of engravings and photographs illustrating the class of works which it is proposed to introduce into schools. The idea seems to be to keep to such as illustrate subjects, either in history or real life, such as children would be likely to understand and sympathise with. The publishers are prepared, in many cases at least, to deal with the association on very liberal terms for works which are intended “for the use of schools,” so that both the æsthetic and commercial sides of the matter seem at present to be in fair train. The specimen collection in Bond-street exhibits, on the whole, a very suitable class of work for the purpose, and we have not the slightest doubt of the additional interest and instruction (be it added) which children may gain during school hours from pictorial representation selected on such a principle. Our only doubt is whether this and some other efforts to bring art before “the people” may not come to be practically a higher kind of almsgiving. But the association may at least do good by assisting to start an idea, which may eventually be carried out on a more self-supporting principle.

THE address of Sir J. W. Bazalgette, on his taking the Presidential Chair for the first time last Tuesday at the Institution of Civil Engineers, dealt in a very able and interesting manner with the great subject of the government and health of London, affecting the interests of a population, as he reminded his hearers, equal to that of the whole state of Holland, and double that of Denmark. The address was, on the whole, rather a summary of the present situation than a plan for future action, except so far as some conclusions on this latter head would follow almost necessarily from the facts summarised. In speaking of the great sewerage works of the last ten or twelve years, Sir J. Bazalgette compared with this the state of the London death-rate during the recent years. The main intercepting scheme was practically completed and came into operation in 1870-71. The mean annual death-rate for the decade ending 1850 was 24·8 per 1,000; in the next decade 23·7; in that ending 1870 24·4; in that ending 1880 it had fallen to 22·5; and in 1882 to 21·4; and though *post hoc ergo propter hoc* has been decided to be bad in abstract logic, it may be fairly assumed to hold good, in great measure at least, in the logic of sanitation, and is, at all events, the only obvious and generally intelligible test in regard to that class of improvement in our method of living. Touching on the question of the housing of the poor, the President of the Engineers' Institution re-affirmed what has generally been accepted as the truth by those who can look at the subject in a rational manner (which, we admit, it is sometimes difficult to do, in view of the magnitude and tragic nature of the problem), that we have nearly sufficient legislative powers to deal with the subject, if properly exercised; but he strongly urged that more summary powers should be granted to compel landlords to maintain their houses in a habitable and cleanly condition.

THE Marchioness of Waterford calls attention, in a letter to the *Times* of Thursday last, to the project for a decorative art exhibition to be held in Dublin in February, under the auspices of the Royal Irish School of Art-Needlework. The main object of the exhibition is to encourage amateurs to produce well-executed decorative needlework, wood-carving, lace, &c., or designs for such work, for which prizes will be given; and objects of artistic value for a loan exhibition will be welcome. Every one will sympathise with the desire to promote artistic interest and power of design among Irish workers. We only add a caution against the kind of mistaken zeal which has occasionally shown itself in endeavours to promote a market for Irish art-work by artificial means, as was evidently done in regard to Irish lace,—a matter we commented on in our notice of the Irish lace exhibition at the Mansion House some little time back

Let Irish art-work and design be shown to be superior to other work at the same prices, and its market will come; to attempt to force it can only lead to disappointment.

THE article by the First Commissioner of Works, in the current number of the *Nineteenth Century*, on “The Statues and Monuments of London,” not unfitly culminates in the revival, with modifications, of a suggestion for the practical enlargement of our great national resting-place for the specially honoured among the dead. Referring to Scott's proposal for a monumental cloister or chapel, Mr. Shaw-Lefevre seems to have got out for a moment in his points of the compass, as this must have been to the south-east, not the “north-east” of the abbey, as stated in the article. He objects, however, to Scott's proposal, as bringing the new cloister too prominently forward in advance of the line of the abbey eastward, and involving an expenditure of about 200,000*l.* in the mere purchase of property for removal, along the line of Abingdon-street and as far as Great College-street, and hiding the old Jewel Tower at the back of Old Palace-yard. He proposes a monumental chapel not extending beyond the east line of Henry VII.'s chapel, on the east side of the Little Cloisters, and united to the abbey, in the manner proposed by Scott, by a covered passage passing under the buttresses of the chapter-house, clearing out the houses in Old Palace-yard and Poet's-corner and opening out the chapter-house and the south side of the abbey. This scheme would be certainly much less costly, and would secure some immediate monumental and architectural desiderata. Still, as it is a project in regard to which the saying may be applied, “Take heed what you are about, you work for eternity,” we are inclined to advocate as large and grand a scheme as possible, leaving for posterity ample room for doing honour to the many great sons whom we fondly hope England may still have to lay to rest under monuments worthy of their fame and her greatness, if any of that is to be left to us. We have always regretted that the idea of a great mausoleum on the vacant ground south of the Houses of Parliament was allowed to drop. It would have been a splendid opportunity for something great in architecture, both as to scale and effect.

WE notice with great pleasure the announcement of a special exhibition of the works of Mr. Alfred Hunt, at the rooms of the Fine Art Society, 148, New Bond-street, the private view of which is fixed for to-day (Saturday). To those who know and appreciate the quality of Mr. Hunt's work there is no occasion to recommend such an exhibition; to those who unfortunately do not, it may, we hope, afford an opportunity for becoming better acquainted with the work of the most conscientious and poetic English landscape-painter since Turner, and learning to understand the delicate and refined beauty of his interpretations of nature. The collected exhibition of Mr. Hunt's paintings will not only be a source of great interest and delight to many, but it is the best and most pointed reply to the disrespectful treatment to which he has been subjected at the hands of the Royal Academy, who have the assurance to return works by such an artist, and hang “receipt landscapes” of their own on the line.

MR. G. ATTEMSON has just completed, in conjunction with Mr. Britten, the decoration of the morning-room at Lord Leconfield's house, at Chesterfield-gardens. The architectural portion of the work consists (in part) of a large bookcase, in ebouissé wood, occupying one end of the room, with rich carved work in Renaissance style, and a frieze of foliage design inlaid in white on the black ground, with heads in medallions designed by Mr. Britten. The chimney-piece and over-mantel is a massive erection in ebouissé wood with similar inlaid scroll ornament; portions of this are painted with scroll ornament in gold, with very good effect to the eye, but we rather regret the employment of surface painting along with inlay, the former method appearing deficient in

permanence and solidity when seen alongside of inlay. Mr. Britten has painted a clever and effective frieze, representing a party of Cupids attempting to mount the backs of dolphins, and finally coming to grief in the ride; a pretty and rather novel adaptation of an old artistic motive.

THE ARCHITECTURE OF ENGLISH FICTION.

"I designed to allure my readers with the variety of my subjects, and inasmuch, if I could, the weight of reason with the agreeableness of wit."—STEELE.

No treatment of the subject we have in hand would be reasonably complete without a passing glance at the English essayists of the eighteenth century. Their works are essentially works of fiction. The writers call themselves Novelists, although they meant no more by the term than purveyors of news; the news element soon dropped out of their scheme, and their works are, in the modern sense of the word, novels. Every essay is a short story, and the characters which figure in them are mere creatures of the imagination. Sir Roger de Coverley will pair off with Colonel Newcome, and the Dorindas and Cynthias of that day are but the counterparts of the Amelias and Beckys Sharps of ours. We were told by the first of this accomplished band of authors that the regulation of Taste (with a capital T) was a principal object with them, and that they intended to leave no topic connected with the general good of mankind untouched. Their works, like poor Tom Hood's "History of the World, by Percy Vere," may now be read in forty volumes. And very pleasant reading they are. The whole social economy of the time is laid bare for us to the minutest detail. The languid beau ogles and dangles across the stage, and the bells of the period admits us to the inmost recesses of her daily life and thought. The gravest subjects which can engage human speculation are treated with becoming decorum and seriousness, and the foibles and vices of mankind in general, and eighteenth-century man and woman kind in particular, are the subjects of a restless sportive railleury, and a searching, scorching wit. And over the whole is thrown that indescribable charm of style, in which the writers of these essays have never been surpassed.

But in these forty volumes you will scarcely find forty references or allusions to architecture. It is to be hoped that no reader will be at pains to count them, and, finding forty-one, put the present writer to an open shame.

A friendly critic has complained of an injustice done to Smollett in that it was stated in a previous essay that he ignored architecture. The word was badly chosen. But not altogether so. He has nothing to say of the beautiful Bath Abbey church, except that it strikes cold upon entering it, and that these old churches of the kind would be more comfortable if wainscoted. To him Durham Cathedral and Castle appear a "confused heap of stones," and the exterior of York Minster "cannot but be displeasing to the eye of every man who has any ideas of propriety or proportion." "Towers and steeples serve to make the pile more barbarous." This, certainly, is not ignoring architecture, and Smollett is entitled to the benefit of the correction. If some of the passages in his works have dropped out of our memory, it is not worth while to renew our acquaintance, for, with all their undeniable cleverness, they have certain drawbacks. They resemble those ingenious modern fortifications of the Chinese, in which the too-curious explorers find themselves unawares in deep pits of filth. So much for Smollett.

Sir Richard Steele was himself appointed surveyor to the Royal Stables at Hampton Court. "Surveyor" is a word conveniently vague; and in those days of fitting or misfitting men who had earned the gratitude of the ministry with sly surreptitious duties attaching to the post were probably difficult of definition. We may safely say that no professional qualifications were either exercised or required.

Are we to ascribe this reticence on his part with regard to architecture to modesty? In one of the papers in the *Tatler* we find this sentiment—"It is ridiculous for any man to criticise on the works of another who has not distinguished himself by his own performance." Yet neither Steele nor Addison had any professional acquaintance with law or medicine; subjects which they handled with uncon-

strained freedom. It is probable that in the days of Queen Anne the public taste in the matter of architecture had settled down, and a subject on which no one had any misgivings was not thought a suitable one for discussion. It is hard to get up a controversy when all are agreed. Gothic art was hopelessly discredited, and no Walpole had arisen to discover in its neglect and decay those picturesque beauties which a later age admitted without reserve. An age which found its ideal in "Cato," and neglected the Elizabethan drama, could hardly be expected to admire the singular and fantastic charms of the Gothic church or Jacobean mansion, and the architecture and art of the first half of the eighteenth century were accordingly alike cold, stately, and formal.

The real views of the writers escape, as we before noted, as it were unconsciously and by accident. And we thus get incidentally a better insight into the facts of the time than when any attempt is made to describe them deliberately. Some of the views which passed without question strike us now as not without a humorous side. And one point which crops up now and then is the almost superstitious reverence which is paid to our too familiar friend the sash-window. Steele is scandalised to find small warehouses and even private shops, supported on *Corinthian* pillars; and a row of tinpots shamelessly showing themselves for sale "through a sash-window,"—a piece of unpardonable effrontery on the part of the said pots.

In a series of humorous proposals for the enlargement of Bedlam, the architect comes in for part of the fun. The inmates are to be lovers who are, by presumption, out of their wits, and politicians who are to be admitted without examination. The architect, doctors, nurses, are all to be lunatics,—with this single proviso, that their mental aberrations is not to be connected with the function allotted to them in the scheme.

Occasionally due homage is paid to art, and architecture, with painting and sculpture, is said to lift up human nature, to contribute to the embellishment of life, and throw into shade its meaner parts.

Such general sentiments as these are easily thrown off by writers who were always writing, and could not always stop to consider what they should indite. It is when they sit down in earnest to treat of architecture directly and deliberately that we see how shallow and inchoate their ideas were on the subject. Steele promised a paper devoted to the art; but, like too many of that light-hearted genius's promises, it was never redeemed. Addison's papers on the pleasures of the imagination could not be completed without a section on architecture, and it is strange to see with what hesitation and distrust he takes up his task, sheltering himself behind a long quotation from a learned French author, whose opinions the essayist was happy and eager to quote as a relief from the further treatment of a matter which he felt to be embarrassing. The preliminary flourishes anent the art which tends more than any other to affect the imagination are dexterously executed, as, of course, they could not fail to be. In closing with the subject, the weakness of the author is apparent. First, he desiderates grandeur of scale as a prime condition of architectural success. In this respect the ancients had all the advantage on their side. An "old author [query name] said that the foundations of the Tower of Babel which were to be seen in his time [query date]," looked like a "spacious mountain." The walls of Babylon and that of China are curiously cited as cases in point; and then comes the "modern instance" in the shape of the Pantheon, and the startling question why the Classic and the Gothic building of equal size affect one so differently and so entirely to the disadvantage of the latter? Ah! Why? The author is ready with an answer. It is the greatness of the manner in the one and the meanness of the manner in the other.

If there is one fact better established than another, it is that the effect of size of a Classic building,—St. Peter's, for instance,—is less, *ceteris paribus*,—than that produced by a Gothic structure, and requires a sort of exercise of mental arithmetic to bring home to the spectators its enormous dimensions. But let that pass, and let us quote the learned French author's receipt for grandeur in building:—

"To introduce into architecture the grandeur of manner, the division of the order [it is taken

for granted that architecture is a thing of "orders"] must be bold, and of an ample relieve, and swelling; for example, in a cornice, if the *gola* or *cymatium* of the corona, the coping [now we are getting learned], the modillions or dentils, make a noble show by [their graceful] projections,—if we see none of that confusion which is the result of those little cavities, *quarter rounds* of the *astragal*, and other intermingled particulars which produce no effect," &c. Oh, Joseph! Joseph!

Hear him once more, the dear, delightful, shameless impostor that he is:—"Among all the figures in architecture, there are none that have a greater air than the *concave* and the *convex*." And then he gives his "exquisite reason" for all this, which, if not quite clear and convincing, is certainly a reason exquisitely given. He forbears to descant on the other qualities of the art which pleasantly affect the imagination, and closing his charming if somewhat discursive and bewildering exposition of his theories by observing that it is not his purpose to observe in detail further than this, that there is nothing in the whole art which pleases the mind unless it is "great, uncommon, or beautiful." Most true! "And so I hold it best that we shake hands and part."

In taking our leave of the writers of this age, we see them firmly impressed with the triviality and *meanness* of Gothic art, in which, says the *Tatler* in his pleasant, off-hand way, "The ornaments are foreign to the matter," and the incontestable superiority of the pseudo-Classic styles which engaged their unstinted admiration. They would have been surprised to hear the sentiments on that subject which were possessed by the fine gentlemen and *littérate* whom we have in reserve, and who will make their bow to our readers on the next rising of the curtain.

AMERICA'S STAND-POINT WITH REFERENCE TO THE FINE ARTS.

BY W. CAVE THOMAS.

THE Great Nation of the West appears to an artist of the Old Country, and one who has earnestly studied the theory and policy of the Fine Arts, to stand in a most enviable position with respect to the successful pursuit of painting, sculpture, and architecture, for the public of the United States have not as yet irrevocably committed themselves to any art-fashion,—they are still free to determine the goal towards which the artistic genius of the States shall direct its energies. Let the American public appreciate this enviable position,—let them well consider whether they shall speed before they commit themselves to any decided action,—let them, calmly and unbiased, survey the art of the past,—and then ask themselves, "What epochs in the history of the human race have been epochs of the most consummate manifestations of art; and what national art developments most deserve admiration and study?" Well-read as the Americans are, they will not pause long for a reply; their ready answer will be, "The Fine Arts of Greece and of Mediæval Italy." There have, of course, been many fine art developments of various degrees of merit; there is art and art; but the fine arts of any other than of those two great art epochs are of a lower grade, and less worthy of being admired and imitated. It is clear, therefore, that Grecian and Italian art are *par excellence* the great examples, which a sensible people would steadfastly keep in view, and encourage their talented sons to emulate.

Let the public of the United States well consider, too, how that consummate excellence was attained; let them inquire whether it can be gathered from history that art was promoted by anything like that tall talk which is now so fashionable on art topics, or by anything at all resembling the organisation which has been adopted in Europe professing for its promotion. And they will have to confess, I think, it was not. No! Art was, in the great art epochs, like everything else that has been of lasting value to the world,—the outcome of common-sense proceeding. Half-educated persons are apt to attribute genius to those who display, either in their artistic or literary work, the greatest amount of eccentricity, and are inclined to hail, as apostles of truth and high priests of art, the men who uphold such work, with perhaps still more erratic commentaries of their own. Unintelligent and rhapsodical criticism is the veriest bane of modern art.

The faculty of reason, in the great times, was

esteemed the divine faculty. This would appear not to be the opinion of our day. The divinity of genius is now attributed, both in literature and in art, to the producers of the most unreasonable and inconsistent works. As if that can possibly have the attribution of divine, which is devoid of all traces of law and order, of reason. Therefore, if hyperbole be now and then permissible, and a poet venture to speak of "snatching a grace beyond the reach of art," that grace must be due not to any deficiency of reason in the genius who snatches it, but to some superior intelligence and reasonableness. Think to what an abject state criticism has descended, when it maintains that art-excellence is in the ratio of its inconsistency. The Greeks appear to have taken art as so reasonable and commonsense a pursuit that their great masters do not appear to have manifested the least anxiety to sign their works. Not one of those marvellously fine productions that crowned the Parthenon has the name of Phidias inscribed upon it, showing that this great sculptor was conscious that Nature never lends one scruple of her excellence, but claims both thanks and use. Whereas every slab of a frieze in these days would have its maker's name conspicuously and deeply incised.

Having elected Grecian and Italian art, as the arts most worthy to be emulated, and found that their excellences could not be due to unreasonableness, let us see whether we can express in words wherein the higher art, in literature, painting, and sculpture, consists. Certainly it does not consist in either of these arts being devoid of, but, on the contrary, in its being instinct with, intellect; and thus we perceive that the finest art was not contemporary with the infancy, but the manhood, of a nation; that in Greece and in Italy the best art was not spontaneously produced, but only by degrees, by progressive development, art progressing as intellect and civilisation progressed. It is the evidence of the presence of a greater amount of intellect in Grecian and in Italian art that gives them supremacy. In referring to history, for instruction on these points, we also come to perceive that art is the flower of civilisation, and not the root and cause of it, as is commonly and most erroneously supposed. There is no instance of the greatest painters and sculptors heralding a civilisation.

The modern and ridiculous notion that art is the cause of civilisation induces many persons to fill their dwellings with bric-à-brac and all kinds of *vococo* productions, in order to show their friends and acquaintances that they must necessarily be tasteful and civilised by living in the immediate presence of such varied art surroundings, but in nine cases out of ten not one of those surroundings has the slightest pretensions to be considered a specimen of sterling art. There may be puerile Chinese and Japanese productions in profusion, exhibiting here and there a trace of the true art instinct, but oftener you shall find those *objets d'art* nothing but the realisations of the hideous nightmares of the awakening intellect of semi-barbarous peoples. You shall find in those surroundings, too, a host of oddities in the way of furniture, and Louis XIV. glass frames bedizened with tortuous ornament, every single piece of which betrays a laxity and demoralisation consonant with the times that produced it. All this forms a sad spectacle to the man of true taste, who, instead of being impressed with the civilised and æsthetic culture of the possessors of such collections of rubbish, is rather reminded of the barbaric bead and feather decorations of the savage. The man of judgment knows full well that the foundations of true taste—inhere in simplicity, in order, in proportion,—in short, in moderation. The man of taste does not crowd the walls of his rooms with bits and scraps of oil and water-colour paintings, encumbered with hideous frames of various patterns having not the slightest connecting link, the least congruity. If he be fortunate enough to possess either a fine picture or a fine statue he will accord it a place of honour in the midst of a calm, blank space of wall, a feature of which the Italian decorators so well knew the value. The furniture, hangings, &c., in the house of taste will be simple; they will not be overlaid, bedizened with excess of colour and of ornament, as is so much the fashion in Europe. The man of taste likes to feel that he has elbow-room and space to breathe freely in, in his dwelling apartments; he does not desire to be in danger, if he move, of breaking some insignificant cup and saucer, whose

only claims to respect are that they have been purchased at some fabulous price, and that they were baked in the ovens of some famous old pottery. He has none of the morbidity and fussiness of your latter-day æsthetic. He is not to be taken in by your rhapsodical talkers, who herald in some underdone genius as if he were entrusted with some new art revelation. The man of judgment knows that the acme of painting and of sculpture has been reached, and that the best art of the future must travel on precisely the same lines as the greatest art of the past.

With reference to art in the house (one of the subjects), it is the professed object of this journal to discuss, the writer concurs with the editorial directorate in giving precedence to the consideration of the topics of warming, lighting, ventilation,—in short, to all sanitary considerations; for, without the best conditions are fulfilled in those respects, a house embellished with art is but a gilded sepulchre. But all wholesome conditions being fulfilled, the art in a house should be an integral part of its design, and hold an appointed and important position, as in ancient Greece and Mediaeval Italy. Art, indeed, was in the greatest epochs almost entirely associated with decoration. All buildings were then designed to be crowned with painting and sculpture. The Parthenon itself was designed to be the house of Minerva and to be the "setting" of the Phidian jewels. To Phidias himself was entrusted the supervision of the whole, the control of all the *tektones*, from the architect to the tapestry-workers. Art, in detached easel pictures and in bits of sculpture, not designed for any place in particular, is of comparatively recent origin, dating, in fact, from the decadence of the great epoch of Italian art, from the decline of mural painting and architectonic sculpture. If, then, the modern *virtuoso* desire to gratify his taste for easel pictures, &c., let him have either a room or a gallery expressly designed and built for their exhibition, in order that their allocation may not interfere with the symmetry of the decorations of the dwelling-apartments. The advice of Polonius to Laertes, with reference to dress, may, with slight verbal alterations, be applied to the outermost dress of the man,—the house that he dwells in:—

"Costly thy dwelling as thy purse can spare,
But not express'd in fancy; rich, not gaudy;
For the surroundings oft proclaim the man,
And they in France of the best rank and station
Are most select and liberal in that."

Let the maxim of your manufacturers be 'before all else, perfect adaptation to purpose.' That is the maxim which will gain the markets of the world. To lead your producers to suppose that the overlaying of everything with ornament is the true aim, would only be to corrupt and deteriorate the principle of good design and workmanship, and lead to meretricious and unprofitable emblazonment.

In the old countries there is much in the people's surroundings to enchain and bias the judgment in respect to art. There are associations, for instance, connected with the Gothic style to prejudice men's taste in its favour, and even to that extent that they are unable to separate what is intrinsic in it from what is puerile and transient; they will not attempt to extract its principle and work upon that, but insist on imitating all its eccentricities. Gothic, like Egyptian art, was an *arrested* development; it came, incomplete as it was, to an untimely end with the imperfect religious and political institutions with which it was associated and which had, in a great measure, moulded it. A correlation or parallelism will be found to exist between all the different stages of art development, whenever and wherever they may occur. A strong resemblance may be observed in all early art, whether it be Egyptian, Greek, Italian, Gothic, Chinese, or Japanese. The art of a nation is always the faithful reflex of its intellectual status, and in Egyptian art we discern at once indications of the arrested development of the intellect of the people, caused by the persistent opposition of a dominant and priestly caste to freedom of thought and of action. It is the fashion to extol Egyptian civilisation and Egyptian art, and to exaggerate the indebtedness of Grecian philosophy and Grecian art to Egypt. Why? Greece in a few centuries had overtaken Egypt in intelligence and had passed on to that fulness of attainment which the Egyptian civilisation, which had lasted for as many thousands of years, never approximately reached!

Put no faith in *impromptu* geniuses. Even the most highly endowed artists only attained to their greatness by dint of indefatigable industry and a long course of training. Girls and boys may be able, in a certain sense, to paint and to model after attending an art-school for a twelvemonth or two, but the thorough artist cannot be made at that rapid rate. Let America, above all things, believe in, and encourage her own sons to pursue, that higher kind of art, which has been recognised by the highest order of minds in all lands. Let the public edifices be handed over to talented American artists as fields for the exercise of their genius on historical painting, and let them be liberally paid. Let the States leave to their painters and sculptors the foundation of their art-schools and the art-education of the people, as the Greeks and the Italians did. Do not commit the folly of squandering public money on national galleries of old masters in the hope of encouraging art and forming taste. These were not the means adopted in the great art times. The true way was always to make a continuous demand upon the exercise of native talent. Let your national galleries consist of the works of your own painters and sculptors. And then it may be predicted that in less than half a century the American School of Art will be to the front.

THE THREATENED STRIKE IN THE COAL TRADE.

AGAIN we hear the note of warning sounded of an impending strike in the coal trade, and in view of the probable consequence of this system of burning down the house to get roast pig, we may draw attention to one possible result of any attempt to force up the price of coal by strikes which has probably not yet occurred to those immediately interested in the subject. As long as we must have coal for all purposes of fuel, it may seem the best policy to combine for putting the highest price on the labour of procuring it; but what if the idea of extensively available substitute for coal should be started?

The last number of the *Edinburgh Review* gives an account of the enormous petroleum district, covering some 1,200 square miles of territory, which lies to the west of the Caspian Sea; and since then the *Morning Post* has published a series of letters, dated from Baku, in the Caspian, and from Batoum, on the Black Sea, which add, indeed, but little to the facts brought forward in the *Edinburgh*, but which give the graphic picture of a veritable Geyser of mineral oil, springing into the air to a height of 300 ft., and tearing up soil and pebbles in its skyward leap.

The existence of this rich source of mineral wealth in the basin of the Caspian has long been known; and the economic importance of the product was recognised by the astute foresight of Peter the Great. It is, however, only about ten years since that the Russian Government seemed to wake up to the immense national importance of this supply, and that steps have been taken which have led to a rapid development of the industry, rather in American than in Russian fashion. The point that we have to urge, as affecting the colliers, is the nature and value of the refuse left when the petroleum is distilled for commerce.

This refuse, which is called by the Russians *ASTATKI*, is a treacly fluid of high calorific power. It is said to be from three to four times the calorific value of coal, for equal weights, according to Russian calculations. Petroleum, in its crude state, has only about half as much again of calorific value as coal; so that we may here perhaps suspect an over-statement. On the other hand, the mode in which the refuse is burned under a steam-engine boiler allows of so direct an application of the great heat liberated, as to render such a prodigious economy as three to one by no means incredible. What is, therefore, thus indicated as possible, is the production, almost *gratis* (for the refuse is now in part thrown away), of a fuel of three times the value of coal, weight for weight.

The production, however, of such a fuel on the shores of the Caspian may be thought to have but little direct interest for the English collier. It is true that the steamers on the Caspian, and on the great Russian rivers and canals that communicate with its waters, are now fired with *astatki*; and so are the locomotives on the new Trans-Caucasian and Trans-

Caspian railways. But as neither Newcastle nor Cardiff can export to the Caspian, we may be met by the proverb that "it is a far cry to Locbow." Very true, if that were all. But the able and energetic men who have succeeded, since 1872, in driving American petroleum from the Russian market, by the cheaper supplies attainable from the Caspian basin, are as well aware of the nature of the Mediterranean commerce as are any of our own most enterprising merchants. A railway exists from Baku, the present metropolis of the petroleum district, to the Russian port of Batoum on the Black Sea, and in March last kerosine, the refined product of petroleum, was sold in Baku at a penny a gallon. The carriage to Batoum about doubles the price. But it is in contemplation to lay pipes along the course of this railway, through which the crude oil shall be forced, without any further process of handling, as it springs from the soil. And if this is accomplished the cost of transport for the 560 miles will be reduced to a very small fraction. Refineries are already erected, or in course of erection, at Batoum; and on the completion of the pipe, which is far from being an impossible, an unlikely, or even perhaps a long-deferred, contingency, the production of the costless *astakhi* on the shores of the Euxine, within easy reach of the Mediterranean, will be an accomplished fact. And as to probability it should be added that the oil is already sent through sixty miles of pipe from the various wells to Baku.

How might this fact, when accomplished, affect Newcastle? How might it affect Cardiff? Even supposing a brisk demand to raise the price of the *astakhi* to a figure that would add enormously to the profits of the refiners, we cannot estimate it at more than one-third the price of coal, free on board. And then, if the foregoing estimate be correct, the freight will be only from one-third to one-fourth the freight of that of coal, exclusive of any difference that may be due to questions of back-carriage. *Astakhi*, in that case, could be sold in the Tyne or on the Welsh rivers at one-third of the price at which English coal could be sold at Batoum. How would this affect Aden, Port Said, Gibraltar, Marseilles, all the Mediterranean, the Indian, the Australian ports? Guarding ourselves against vouching for the accuracy of the statements now brought so authoritatively before the public, we only say, if these things be so, what may be the effect on our coal export trade a few years hence?

Our coal export trade touches at present on the amount of twenty millions of tons per annum. It must feed the industry of at least from 60,000 to 80,000 colliers. Will it be nothing to have so large a proportion of our great underground army thrown out of work? Nor is that all. Coal, coke, cinders, and artificial fuel now form about two-thirds of our entire export tonnage. If we suppose that export to be knocked on the head, we shall only require some ten millions of tons of shipping to carry all the produce that we export from the United Kingdom, out of thirty millions of clearance tonnage. The effect of such a disturbance of the course of trade would be (as an arithmetical matter) to raise the price paid for freight on our imports by something like 50 per cent.

The immediate bearing of the information of which we have indicated the sources on the future of the English coal trade is evident. The question lately in debate between masters and men was that of a proposed rise of 15 per cent. in the wages of the latter. This is about equal to 6d. per day, the present wages being rated at from 25s. 6d. to 24s. per week on the average, and the wages claimed being from 27s. to 28s. 6d. per week. It cannot be said that these are high wages, considering the extreme risk, toil, and discomfort of the task of the miner. But, unfortunately, we are not in a position to determine the rate of wages on considerations like these. Do what we may, or what any one may, in the present state of civilisation, wages have an inevitable tendency to settle themselves. The adjustment may be deferred by disputes, but it is clear that a maximum limit is put upon the rise of wages by the competition of the market. We have not at hand the statement of the coal yield of 1883, but that of 1881 was at the rate of 311 tons of coal raised in the course of the year for each workman returned as employed. Wages were, we apprehend, then 10 per cent. lower than at present, as, not so very long ago, there was a rise to that extent. Taking these figures, which are furnished by, or,

at all events, calculated from the Government returns, every ton of coal raised in 1881 cost 4s. for labour alone, exclusive of interest of money, cost of machinery, royalty, and all expenses except wages. If the same rate of yield per man was maintained in 1882 as in 1881 (and there was a diminution in this respect from 1871 to 1881), each ton of coal will have cost 4s. 7d. for wages alone. If this be so,—and to check the calculation we only require the yield of coal in the year, the number of men employed, and the average rate of wages,—it may be very questionable whether the trade can stand a rise in wages to the rate of 5s. 3d. per ton. What is needed for the positive and absolute decision of the question is a statement of the actual sale price of coal at the pits' mouth, or before any cost of transport has been added to the cost of production. The Statistical Abstract for the United Kingdom for 1881 values the 154,184,300 tons of coal raised in that year at 65,528,327l.; figures which show both the largest quantity yet raised and the highest price per ton yet attained, being the same as that for 1880.

In 1870 the highest rate of efficiency on record was attained by the colliery workmen, the yield of that year having reached the maximum of 321 tons per man. The value of coal at the place of production was estimated in the Statistical Abstract for 1870 at 6s. per ton. With the general rise in prices that occurred from 1870 to 1874, the price of coal rose (valued as before) from 5s. to 7s. 4d. per ton. The corresponding rise of wages it is less easy to ascertain, but the rise of nearly 50 per cent. in the price of coal was accompanied by a falling off of 22½ per cent. in efficiency of labour, each miner in 1874 only winning an average of 249 tons of coal.

Thus there are three or four of the elements needed for the solution of the question easily attainable; and the main thing which is required for an authoritative opinion as to the justice or otherwise of the claims of the colliers, is a statement of the average wages earned by them for each year since 1867, such wages being collated with the cost of living in each year. These things are attainable, probably by Government, certainly by the coal owners; and, if we could now command them, we should be able to put the question in a nutshell.

As it is, we have the fact that the present demand would require, for wages alone, 3d. per ton more than the whole selling price put on the coal at the place of production in 1870. On the other side of the question is the fact that the selling value in 1881 was 66 per cent. higher than that in 1870, and the efficiency of the miners, or yield per man, was only 3 per cent. less in the latter than in the former years. As far as this comparison goes,—and its significance can hardly be denied,—it looks as if the men had not participated to a due extent in so great a rise of price. It is within the competence of the miners themselves, or of their advisers, to clear up the point, and that, it will be seen, without reference to the accounts kept by the masters. The "Statistical Abstract" may give approximate prices only, but, running over the period from 1867 to the present time, they cannot be far from the truth. Our reading of the import of the record of the annual yield per man is, that as wages fall the miner exerts himself,—by piece-work or in some other way,—to diminish his loss of income by longer and harder work. On the other hand, with the increased wages of 1874 the men took it more easily. We are the last to blame them for so doing. But the warmer our sympathy, and the more definite our knowledge, so far as it goes, the more desirable is it to have the missing link filled in. Given that, given the rate of wages in each year, compared with the worth or purchasing power of wages, and we have the elements of an equation, the use of which would at once remove the decision of the proper wages of the colliers from the ground of debate to that of scientific proportion. It is in the power of either party to supply the information that we require. Which will be the first to do so?

Messrs. H. & J. Cooper, of Great Pulteney-street, Golden-square, specialists in furniture and decoration, have just had the honour of receiving at the hands of Lord Colville of Culross, a warrant of appointment to Her Royal Highness the Princess of Wales.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the fifth ordinary (business) meeting of the session, held on Monday evening January 7, Mr. Horace Jones, president in the chair, with fifteen members of council, sixty fellows, and thirty-six associates, the minutes of the ordinary meeting, held December 17, were read and signed as correct.

The decease of Jean Baptiste Cléonon Lesueur, hon. and corr. member (royal gold medalist), and of Marie-Antoine Chénavaud, hon. and corr. member, was announced, and the communications in regard to them were read: that on M. Lesueur repeating in brief the main facts already given in a communication from a French corresponding member of the Institute in our columns (page 5, ante), which was especially referred to. In regard to M. Chénavaud, the secretary read a letter received from M. Charles Lucas, Hon. and Corresponding Member, stating that the deceased, described as the "*véritable doyen des architectes français*," was born at Lyon on the 4th of March, 1787, so that he had almost reached the age of ninety-seven years. He wrote a letter only last October, in which he expressed the pleasure he felt in the work of his British colleagues, referring to the volume of "Transactions" he had just then received. He had been a student of the École des Beaux Arts, and had travelled in Italy. In 1827 he was appointed professor of architecture in the school of his native town of Lyon, and held the post for thirty-three years. In 1843 he visited Egypt and Greece, and during a year's travel made a large number of measured drawings of ancient buildings in both those countries. A speech delivered at the funeral by M. Bellemain gave an interesting account of Chénavaud's career, from which it appeared that he was the founder, in 1830, of the Société Académique d'Architecture at Lyon, and its honorary president during the whole of his life. He was the author of several works, namely—"Voyage en Grèce et dans le Levant," text, 8vo., Lyon, 1849, and plates, fo., Lyon, 1858; "Fontaines Esquisses" ob. fo., Lyon, 1864; "Sujets tirés des Poëmes d'Ossian," ob. fo., Lyon, 1868; "Les Poëtes," ob. fo., Lyon, 1874; "Théâtres antiques: leur Grandeur comparée," 8vo., Lyon, 1880; and these he presented to us at various times.

Several donations to the library were announced; and the secretary read a letter from M. Quastel, the president of the Société Centrale des Architectes, acknowledging the last volume of the "Transactions" and speaking of the interest which he had found in them, especially in regard to the illustrated paper on the architecture of Cyprus. The volume had also been reviewed by Dr. Reichensperger of Cologne, in a contribution to the *Literarische Rundschau*, a well-known Catholic journal, published at Würzburg. Herr Ende, of Berlin, a recently-elected hon. corresponding member, had sent through Mr. MacLachlan the plans of several new buildings in Germany; and the institute had been indebted for a number of little kindnesses shown and services rendered to British students of architecture and other winners of those Institute prizes which enabled them to make a continental tour for purposes of study. This last year the holder of the Godwin Bursary, who selected North Germany for his tour, was assisted in every possible way by Herr Ende, who invited him to his house and made much of him during his stay in Berlin. Dr. Schliemann had presented his new work on Troy, and a recent photograph of the Academy of Sciences at Athens, the work of Ritter von Hansen of Vienna, and of another architect, had been received from Mr. Arthur Gates. The correspondence all through the past year with M. Charles Lucas (Paris) had not only been constant, but of the utmost value to those who had to transact the business of this Institute. He had translated the "Suggestions for the Conduct of Architectural Competitions," and the translation had been printed in the *Compte Rendu*, just published, of the last Congress of French architects. Referring to the now extensive foreign correspondence of the Institute, the Secretary read the following letter from Mr. John H. Sturgis, Vice-President of the Society of Architects of Boston, U.S.A.:

"Dear Sir,—Herewith I send you a copy of the First Series of the 'Sketch Book of the Architectural Association of Boston,' and would beg you to allow me the honour of presenting it to the Institute. It is a reproduction of the sketches of members of

the Association, junior to the Society of Architects, composed principally of young men not practising on their own account, but employed in architects' offices. Some of them since the book was issued have 'hung out their own shingle,' to use an Americanism. The Association has no actual connexion with the Institute, or with any chapter, but is a society *per se*. It has a monthly meeting, when sketches are exhibited, being generally a *projet*, and then they ask one of the well-known members of the Boston Society of Architects to come and criticise and give the awards of merit, or rather, I should say that the members of the Association vote the awards after listening to the careful criticisms of their senior, and usually according to the tenor of his remarks, although they are not bound by them. Let me say, in a few words, that we have a parent society in America, with its *locus in New York*, called the American Institute of Architects, composed of Fellows and Associates or Junior Members. These Fellows and Associates live in all the different States of the Union, and are practising architects belonging to local 'Chapters,' each chapter having its separate organisation, with its own officers. The Presidents of the various Chapters are Vice-Presidents of the Institute. The Chapters generally meet once a month; the Institute has stated meetings for elections, &c. A convention of all the Chapters is held once a year in some city where there is a Chapter, and is presided over by the officers of the Institute,—here officers for the ensuing year are chosen, papers are read, &c., and discussions are held. There are Chapters in all the principal cities—New York, Philadelphia, Washington, Baltimore, Chicago, Cincinnati, Boston, &c. My few words have extended too far already. Pray accept my thanks for the copy of the Transactions, which I shall have much pleasure in presenting to the Boston Society of Architects.—Very truly yours,

JOHN H. STONGES,

Fellow of the American Institute of Architects.*

The usual vote of thanks having been voted to the various donors,

The Hon. Secretary also announced that the Council had that day examined and approved the work of William Alfred Pite, the Pugin Travelling Student for 1883, and that the full amount of 50*l.* had been awarded to him. The Hon. Secretary referred to Mr. Pite's numerous sketches and measured drawings, and read a letter from Mr. Pite, with some particulars of his work in Oxfordshire, the ground he had selected for sketching.

The Hon. Secretary also announced that the Council were considering a scheme for presenting the Pugin Travelling Student with a Medal (as well as the sum of 50*l.*) to be called the Pugin Medal, it being felt that the students would be gratified in obtaining a more enduring memorial of their labour than the mere money which to them perished in the using.

The Hon. Secretary then announced that the Council had appointed, for the purpose of carrying out the arrangements for the General Conference of Architects to be held in London in May next, a Special Committee, consisting principally of the Presidents of Societies of Architects in the various provincial centres, who had all consented to act, namely:—

Edinburgh Architectural Association, Mr. David MacGibbon.

Glasgow Institute of Architects, Mr. James Thomson, Fellow.

Glasgow Society of Architects, Mr. James Sellar.

Royal Institute of Architects of Ireland, Mr. J. J. McCurdy.

Berks Archaeological and Architectural Society, Mr. James Rutland.

Birmingham Architectural Association, Mr. John J. Bateman.

Leeds and Yorkshire Architectural Society, Mr. Edward Birchall, Fellow.

Leicester and Leicestershire Society of Architects, Mr. R. J. Goodacre, Fellow.

Manchester Society of Architects, Mr. John Holden, Fellow.

Northern Architectural Association, Mr. Frank W. Rich.

Nottingham Architectural Association, Mr. Fothergill Watson.

York Architectural Association, Mr. Walter G. Penty.

With the following Metropolitan representatives, namely:—

Royal Institute of British Architects,—John Whichcord, F.S.A., Past President; James Ferguson, D.C.L., F.R.S., Past Vice-President; Arthur W. Blomfield, M.A., F.S.A., Member of Council;

Thomas Blashill, Fellow; Edward A. Gruning, Fellow; J. Douglass Mathews, Fellow; and R. Phené Spiers, F.S.A., Fellow.

Architectural Association, Cole A. Adams, Fellow.

The following gentlemen were balloted for and declared to be duly elected:—

AS FELLOWS.

Thomas Turnbull, Wellington, New Zealand.
Thomas Elworthy, St. Leonard's-on-Sea.
Harry Seldon Graves, Associate, Cape Town.
Harold Ainsworth Peto, Associate, 11, Argyll street, Regent-street, London.
Ernest Henry Bayer, Adelaide, Australia.
John Dunn, Associate, 1, John-street, St. James's-square, London.

AS ASSOCIATES.

Joseph Henry Ball (Exam. 1883), Chigwell.
Thomas Bostock Whitney (Exam. 1882), London.
AS HONORARY ASSOCIATE.
Frederick William Yeates, London.

Mr. H. Langston then put a question of which he had given notice, as to why the proceedings at the meetings were not more fully reported, and cited one or two cases. After some discussion, in which Mr. W. Woodward, Mr. Phené Spiers, Mr. Arthur Cates, and other members took part, it was understood as admitted that there were some grounds for bringing up the question, and that the executive officers would in future carry out what seemed to be the general desire of the members.

Another question, of which notice had been given, referred to the Eastbourne Improvement Act, 1879, wherein it was set down that "Every candidate for the office of building surveyor shall be of the full age of twenty-five years, properly skilled and educated in the art and practice of building, and shall hold a certificate of the Royal Institute of British Architects . . . that he has been examined and is competent for such office;" and to the fact that the Board of Examiners, appointed by the Institute, under the 33rd section of the Metropolitan Building Act, 1855, declined to examine a candidate unless he made a *bona-fide* statement that he intended to apply for a district surveyorship in London. The question put by Mr. Lacy W. Ridge was, "Whether that *bona-fide* statement formed part of the statute establishing the examination?" The answer given by the President was, that in his opinion it did not form a part.

Mr. Ridge thought that the statement now required from candidates applying to be examined virtually rendered abortive the intention of the Legislature, as shown in the Eastbourne Improvement Act, 1879, and he was of opinion that the time had come when the District Surveyors' Examination might be made applicable to any similar appointment throughout the country. He would, therefore, propose that it be referred to the Council to consider whether the "statement" could not be so modified as to make the examination applicable throughout the country, and so carry out the intention of the legislature in the Eastbourne Improvement Act, 1879.

The President accepted on his own part and on that of the Council the desire expressed by Mr. Ridge, and hoped soon to see as many candidates at the district surveyors' examinations as might choose to present themselves.

Mr. Charles Fowler doubted whether the Board appointed by the Institute had sufficient powers to examine any except those qualifying for the office of district surveyor under the Act of Parliament. Further instructions were necessary from the Council before the Board could take action in the matter, and it would, in his opinion, be desirable to wait until the next appointment of the Board in May, for possibly some members of the present Board might object to examine in subjects beyond the sphere of district surveyors in London. For instance, drainage would have to be included in any general examination applicable throughout the country.

After a few remarks from Mr. Henry Dawson and the President, the Secretary read the thirty-third section of the Metropolitan Building Act, 1855.

Mr. Edward T'Anson seconded the motion, and it was resolved "That it be referred to the Council to consider whether the statement (that the candidate intends to apply for a district surveyorship in London) could not be so modified as to make the examination applicable throughout the country, and so carry out the intention of the Legislature in the Eastbourne Improvement Act, 1879.

THE ELECTION OF THE COUNCIL.

The motion, in two parts, of which notice had been given, in reference to the election of the Council, proposed by Mr. Ridge, and seconded by Mr. William White, F.S.A., having been discussed by Messrs. Wyatt, C. Barry, R. W. Edis, Prof. Kerr, J. Jennings, H. Dawson, R. Phené

Spiers, Alex. Payne, and Ralph Nevill, it was resolved, "That (1) in the opinion of this meeting it is desirable that some alteration in the composition of the Council should be made at each annual election; (2) that it be referred to the Council to consider what alterations in the By-laws are necessary to carry out the above resolution."

The proceedings of the business meeting being at an end, and the President having asked whether at that advanced hour (ten p.m.), the members would hold the special general meeting summoned to take place at the close of the business meeting, the adjournment of the meeting was moved by Professor Kerr, and seconded by Mr. Wyatt, Fellow. The motion was put to the meeting and lost, and the President formally declared the business meeting terminated.

The special general meeting, of which notice had been given, was then held, to consider a proposed alteration in By-laws XXVI. and XXVII. The notice convening the meeting having been read, the Hon. Secretary stated that the meeting had been summoned in pursuance of the intention announced by the President in his opening address of this session, to propose the substitution of new By-laws in place of By-laws XXVI. and XXVII. now in force, and that the propositions were made on the part of the Council, namely:—

To substitute for the By-law XXVI., actually in force, the following:—

"Any Fellow or Hon. Fellow shall be eligible to be nominated by the Council as President, but no Member who has filled the office for two successive years shall be again eligible for the Presidency until the expiration of two years from the termination of his tenure of office."

To substitute for the By-law XXVII., actually in force, the following:—

"Any Fellow who is or has been a Member of Council shall be eligible to be nominated by the Council as Vice-President, but no Vice-President who has filled the office for six successive years shall be eligible for re-election as Vice-President until the expiration of twelve months from the termination of his tenure of office."

It was moved by Mr. Edis, and seconded by Mr. Christian, "That, in place of By-law XXVI. actually in force, the words proposed by the Council be substituted."

An amendment, moved by Mr. Henry Dawson, and seconded by Mr. Jennings, to leave out the words "or Hon. Fellow," having been put to the meeting, was carried.

The original motion as amended having been put to the meeting, was carried *nem. con.*

With reference to By-law XXVII., it was moved by Mr. Edis, and seconded by Mr. R. Phené Spiers, "That, in place of By-law XXVII. actually in force, the words proposed by the Council be substituted." The motion, having been put to the meeting, was carried *nem. con.* The meeting then adjourned.

INDIAN ENGINEERING.*

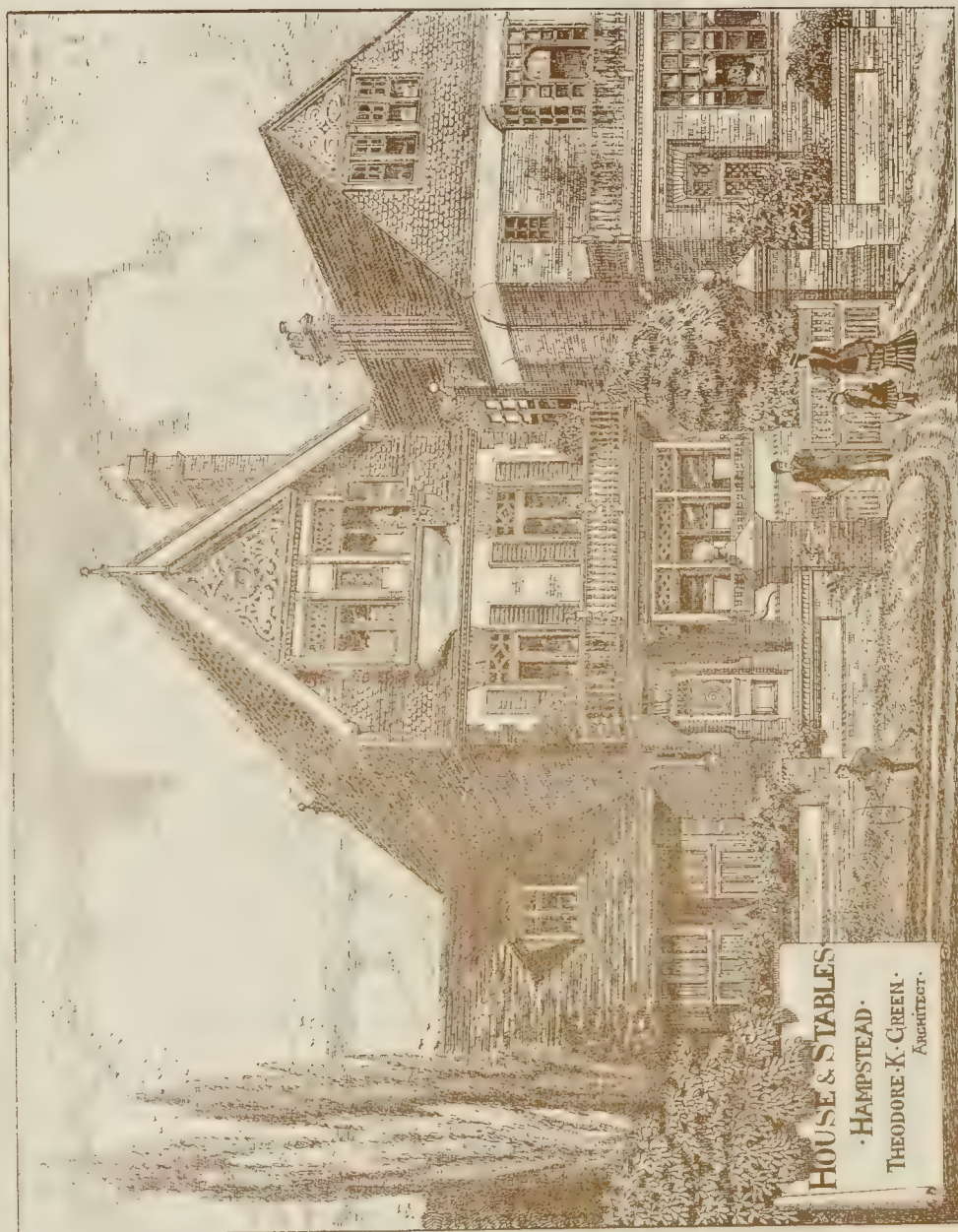
In these papers, irrigation and the conservation of water,—subjects of paramount importance in a country like India,—occupy, as they should do, the chief consideration.

An elaborate and interesting account is given by Mr. R. G. Kennedy, Exec. Engineer of the Bari Doab Canal of the irrigating duty it performs, i.e., the proportion of the useful effect to the loss resulting from various causes, with a view to determining the necessary supply of water required to irrigate a given area. Even in a country like India, it appears that the loss through evaporation in the hottest months bears but a small proportion to the loss through absorption. The former, amounting to about one-eighth of an inch per day, while the latter reaches ten times that amount. The total loss from various causes amounts to 72 per cent. of the water pumped into the canal, so that the duty performed is only 28 per cent. It seems probable from the remarks of Mr. T. Higham, Sup. Engineer, and others, that, with care and management, a saving of another 16 per cent. might possibly be effected; even then the loss would appear excessive.

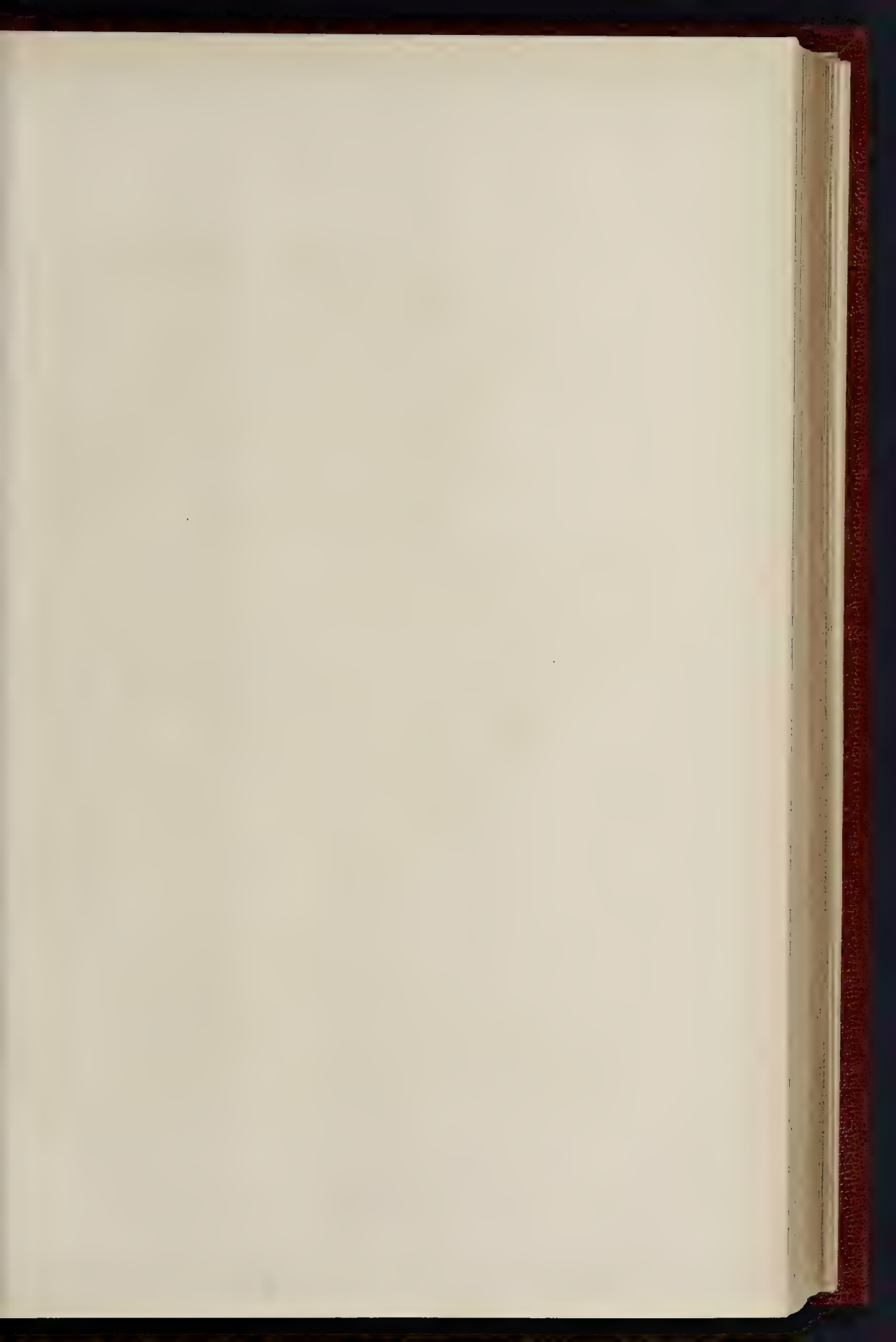
We have also an interesting account by Mr. F. L. Dibble, M.I.C.E., of an ingenious

* Edited by Lieutenant-Col. A. M. Brandreth, R.E., Principal of the Thomason Civil Engineering College, Roorkee. Sept., 1883.

The Annual Supper of the workmen at the Kingsbury Iron Works (Messrs. E. & H. Houghton Brown, proprietors), Kingsbury-road, Hull, took place on Saturday evening at the Railway Tavern, St. Andrew's-street, when about thirty sat down to capital supper. The chair was occupied by Mr. E. Houghton Brown, who was supported by Mr. E. Allen, Mr. Newman occupying the vice. The toast of "The Firm," was heartily received, and responded to by the Chairman, who expressed regret at the unavoidable absence of his brother, Mr. E. Houghton Brown, who said he hoped next year to see double the number sit down, as such gatherings as these went a long way to cement the good feeling which should always exist between master and workmen.



HOUSE & STABLES
- HAMPSTEAD -
THEODORE K. GREEN,
Architect.



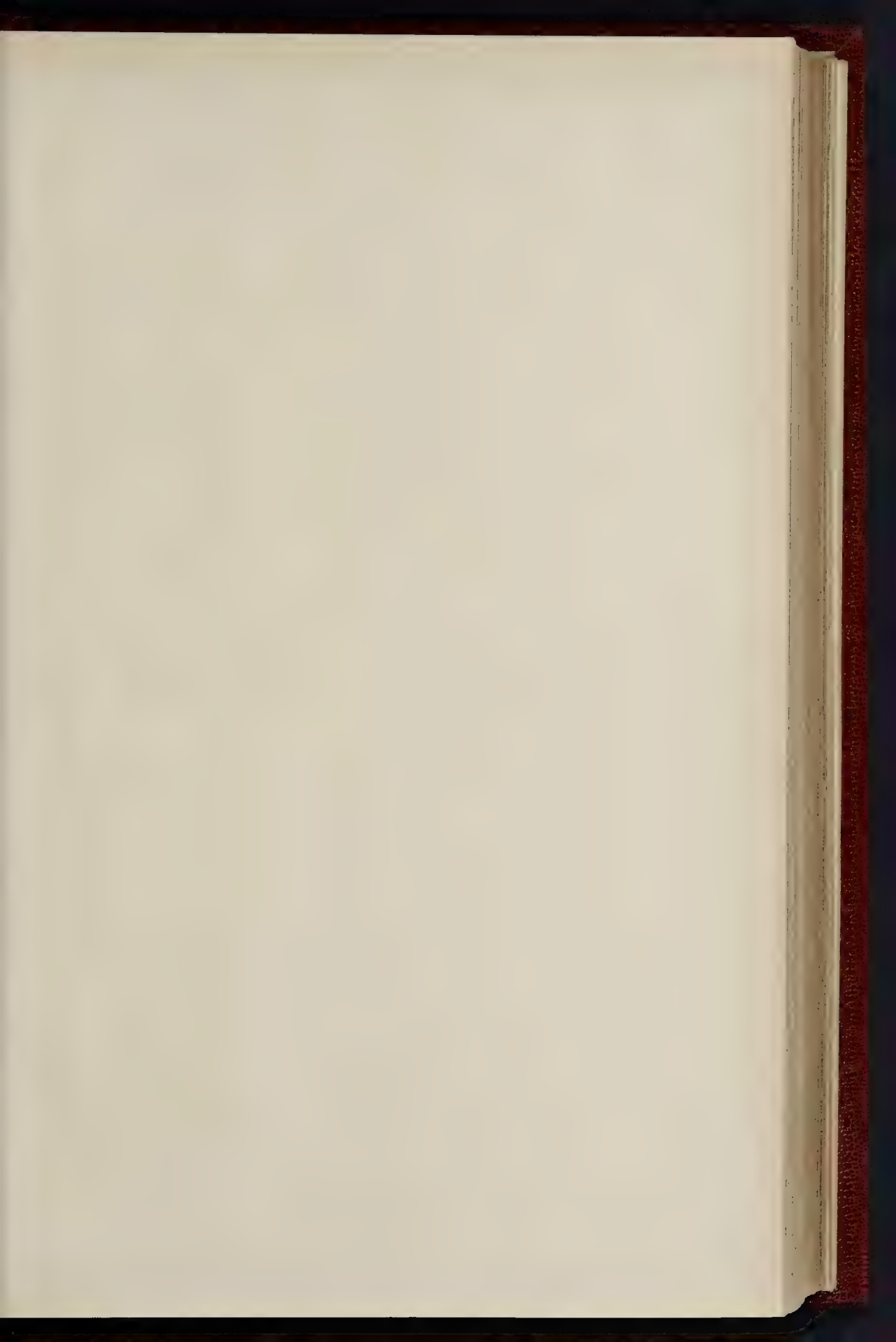
THE BUILDER, JANUARY 12 1884



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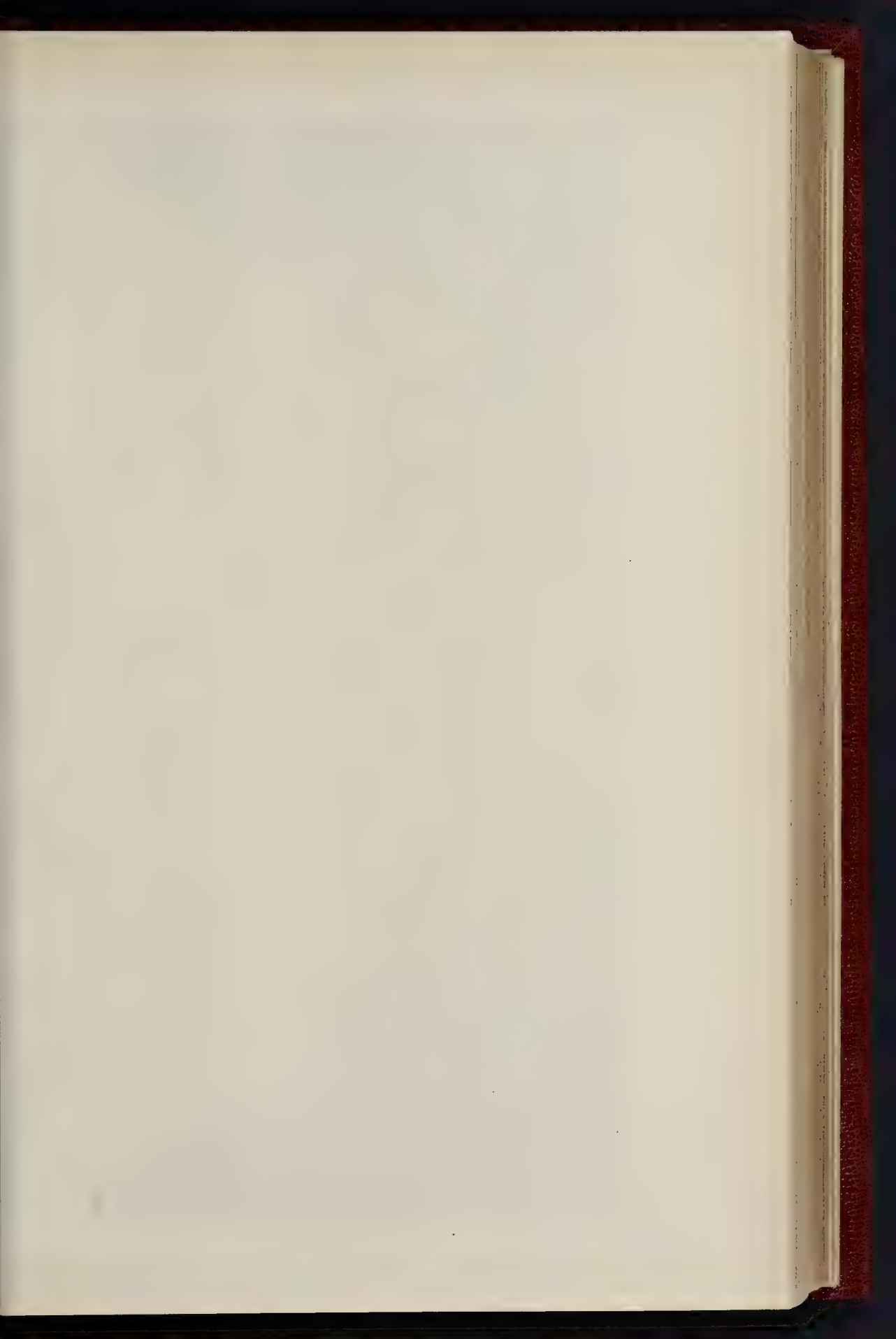
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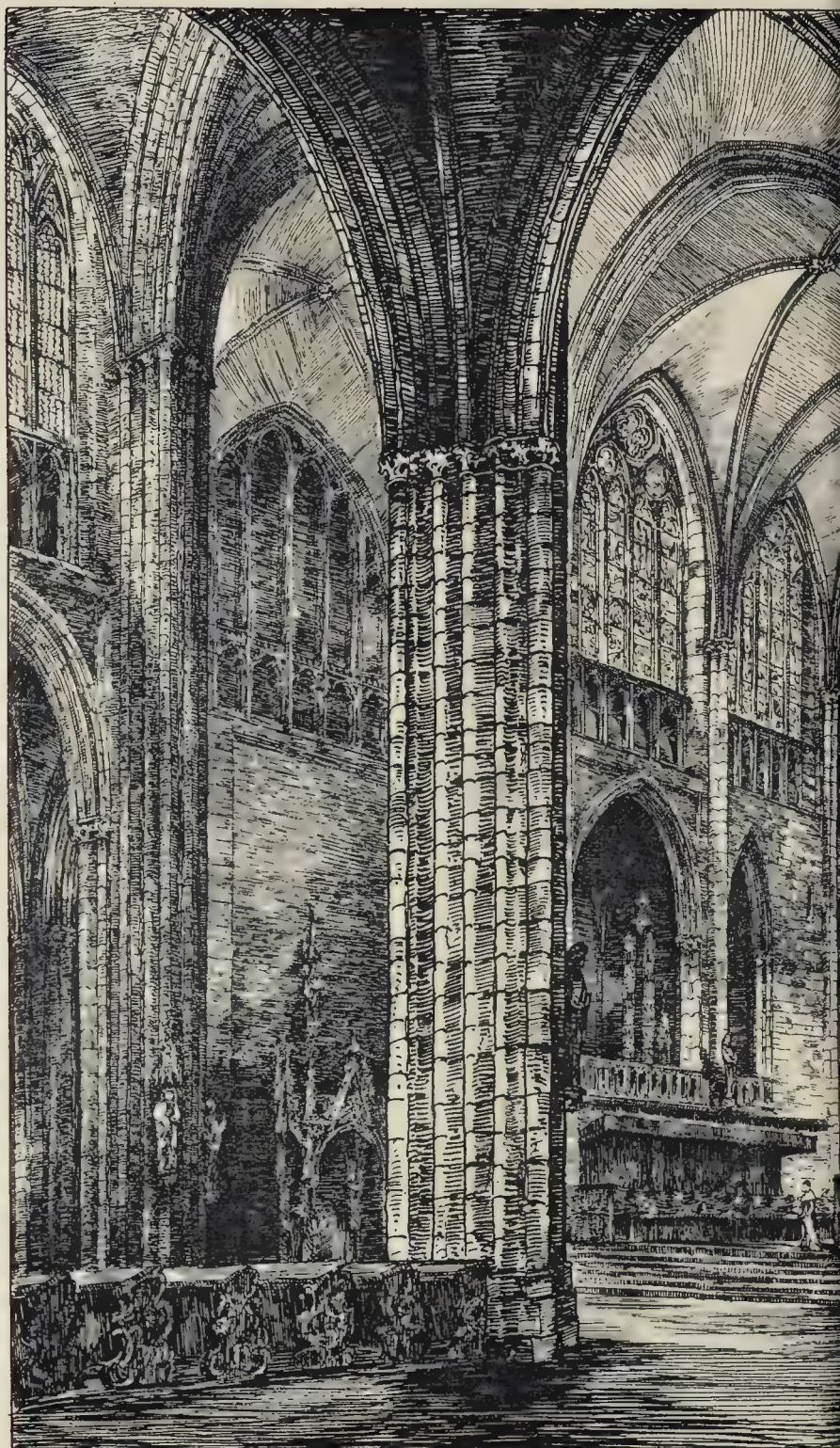
HOSPITAL FOR INFECTIOUS DISEASES, NEWCASTLE.—SELECTED DESIGNS BY MR. ARTHUR B. GIBSON, ARCHT.



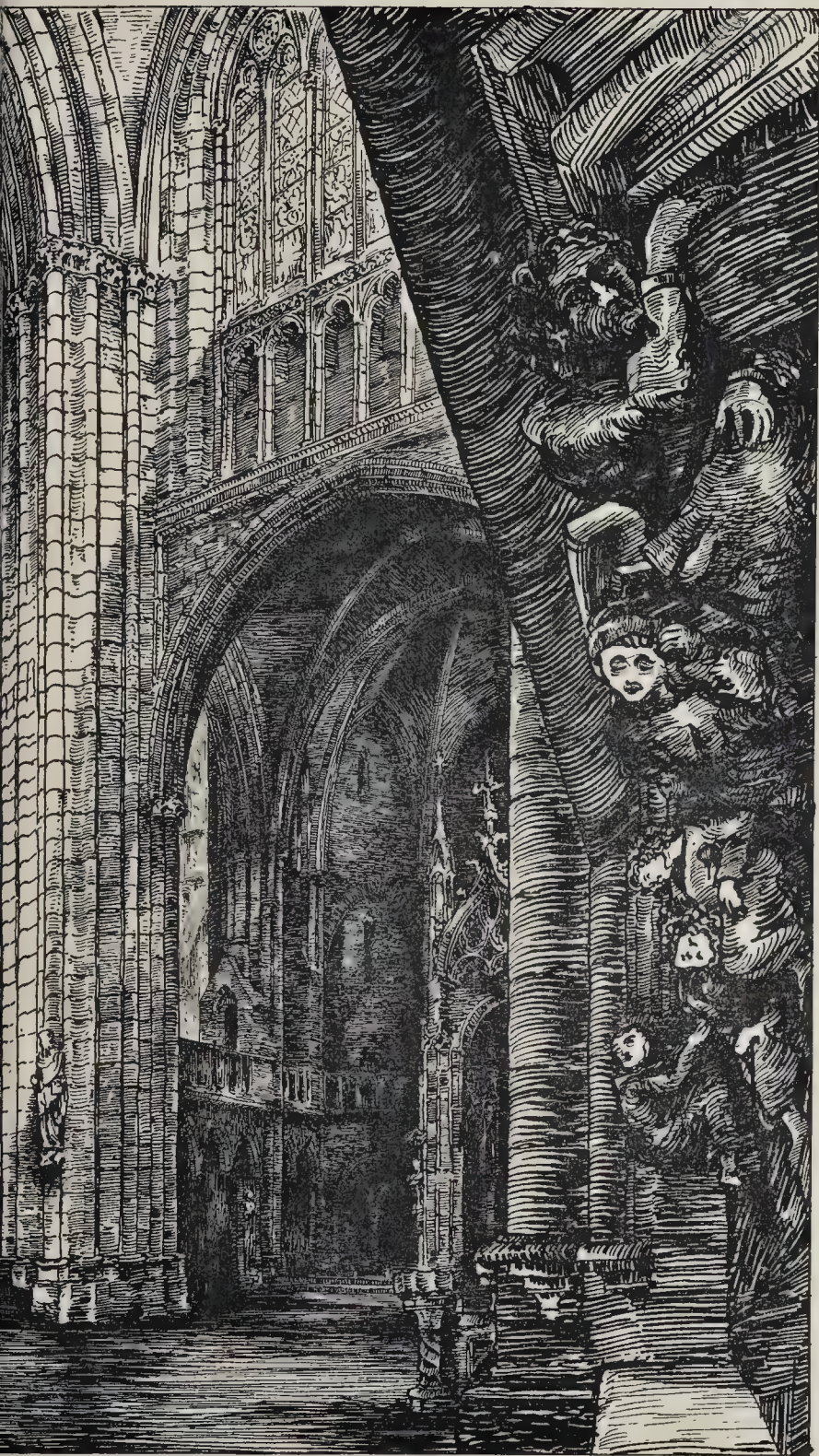
HOSPITAL FOR INFECTIOUS DISEASES, NEWCASTLE







A Beresford Pitt, dell'



C F Kell Photo-Lith & Printer



CHURCH: Vicarage and Parish Room; Christ Church; North-Kensington; London.

Designed by J. W. C. C. Architects, 28, Southampton Row, St. Pancras, London. Wm. and John, Printers, Queen St.



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PRESBYTERIAN CHURCH (OF ENGLAND), HARTLEPOOL. — MESSRS. T. L. BANKS & TOWNSEND, ARCHITECTS.

THE INTERIOR OF RATISBON
CATHEDRAL.

This cathedral has been previously illustrated by Mr. Brewer's drawings of its characteristic German apse and its side altars, with their baldachins. The view now published is one looking across the transepts towards the choir. The justness of proportion that distinguishes this cathedral, and its beautiful internal effects as evening draws in, will be remembered long after the very many other interesting points of the building are forgotten. Excepting the sunk spandrels to the nave arcade, which give an uncomfortable appearance of thinness to the wall, there seems to be nothing lacking in its perfection. The detail is so well designed that it is never obtrusive, and leaves the eye to enjoy the complete calmness and repose of the interior.

There is no large window in the north transept, as a tower erected for scaffolding purposes when the church was being built still remains (and one would not wish it away) against the external wall. A holy well with a beautiful canopy stands in the south transept. The mass of carved figures to the right of the picture are the corbels under a wall arcade which, grouping into a mass, hide the arches they carry. The drawing is from a study in ink made on the spot.

CHURCH, VICARAGE, AND
PARISH ROOM, CHRIST CHURCH,
NORTH KENSINGTON.

The above vicarage is just being completed. It consists of basement with larder, beer-cellar, wine-cellar, and a large coal-cellar. On the ground-floor are dining and drawing rooms, study, kitchen, scullery, cook's pantry, china and store room, lavatory, and water-closet. On the first-floor are four bedrooms, a dressing-room, a bath-room, and a water-closet on the half-landing. On the second-floor there are five bedrooms, and box and cistern room. It is built of stock bricks, with red brick dressings to all quoins and door and window jambs. It is covered with tiles. Special attention has been paid to ventilation and sanitary matters, and a large shaft runs to the top of the house to take the smells from the kitchen. The contract is 1,894. The architect is Mr. J. E. K. Cutts, of 28, Southampton-street, Strand. The church was finished and opened in April, 1881; it was designed by the same architect, and was built by Messrs. Hook & Oldrey. It seats 750 people, and cost, including fittings, architect, and everything complete, 5,103. The parish-room will probably be commenced in the spring, and the estimated cost is 1,000.

PRESBYTERIAN CHURCH OF ENGLAND,
HARTLEPOOL.

The above church, of which we give an illustration this week, is built on the site of an old stone quarry at the junction of Brougham-street with Union-street.

Union-street has a very steep descent, about 13 ft. in the length of the building, so that well-lighted Sunday-schools were obtainable under the church.

The accommodation of the building is as follows:—

Church, to seat on the ground-floor, 450; in end gallery, 100; minister's vestry, manager's room, ladies' room, organ-chamber, large Dorcas room over the manager's room.

Sunday School:—Main school, with three large class-rooms at the end, facing the superintendent's platform; large infant school; teachers' room, and kitchen.

The style of architecture is Perpendicular, with some Flemish feeling. The material is red brick, with red freestone from Egremont, in Cumberland. The entire cost, exclusive of site, is a little under 5,500.

The contractor was Mr. Jonathan Johnson, of West Hartlepool; and the architect is Mr. T. Lewis Banks (now Messrs. T. L. Banks & Townsend), of 23, Finsbury-circus, London.

Australian Timbers.—At the Calcutta Exhibition there is a fine display of timber specimens from New South Wales, showing the richness of that colony in woods suitable for industrial purposes of almost every description.

FOUNTAINS ABBEY.

This was the subject of the paper read at the meeting of the Architectural Association on the 4th, by Mr. J. Arthur Reeve.

After describing the main points in the origination and the character of the Cistercian order and their buildings, and referring to the valuable elucidation of the subject by the late Mr. Sharpe, the reader of the paper commented on the special and almost universally observed rule in regard to the position of the Cistercian abbeys in a secluded valley, as if seeking the greatest possible distance from the everyday life of the world, and continued:—

This similarity of position is by no means the most striking point of resemblance between different abbeys belonging to this order, for on making a careful comparison of many Cistercian monasteries, we find that the general disposition of all the main buildings, namely, those surrounding the cloister-court, is almost identical in every case; so much so, in fact, that it is possible, as Mr. Sharpe has shown, to give a typical ground-plan which shall be a fairly true representation of the Cistercian abbeys built before the year 1200. This early arrangement of the buildings is still almost perfect at Fountains, the only alteration which has been made being in the choir of the church, which, during the first half of the thirteenth century, was reconstructed on a very grand scale. During some excavations, however, which were made about thirty years ago, the foundations of the original choir were found, which show that when first built Fountains was no exception to the rule then generally obtaining throughout the Cistercian order.

The ground-plan of this splendid abbey is hanging up on the wall yonder, and, if you can see it, will help you to understand this peculiar disposition. You will see that the cloister-court forms almost a perfect square in the centre, and round this are placed most conveniently the various buildings in the following order:—The whole of the north side is occupied by part of the nave of the church, which also extends westward beyond the *domus conversorum*. The east wall is formed by the west wall of the south transept, the chapter-house, and a small portion of the frater; on this side we also find a sacristy between the church and the chapter-house, and a passage between the latter and the frater; these are generally to be found more or less in these positions respectively. On the south side are the kitchen, refectory, and buttery, and at the eastern end, between the frater and the kitchen, is placed the staircase leading to the monks' dormitory, scriptorium, &c., on the first floor. The west wall of the cloister is flanked by the northern part of the great building destined for the use of the *conversi* or lower order of monks, who, like their superiors, had a large day-room on the ground-floor, and as large a dormitory above.

Of these several buildings the church and the chapter-house run east and west, and the frater, refectory and *domus conversorum* run north and south, as at Cîteaux, but not universally adopted.

I will now proceed to give a short description of these buildings in the order in which they have been mentioned.

The original church at Fountains, before it was altered, was a good type of the earliest form of Cistercian churches, describing on plan the shaft of a true Latin cross. The nave is long, and the chancel and north and south arms of the transept are all short, and of about equal lengths; the nave had aisles which opened into the transept, but these aisles were not extended to the choir; the transept, however, is provided with chapels projecting from its eastern wall, which flank the choir for about half its length but do not communicate with it. At Kirkstall there are, and at Fountains there were, six of these chapels, three in each arm of the transept, but in France there seem usually to have been only two, partly because not unfrequently the French choirs had aisles even in the earliest abbeys founded by this order. The choir itself and all of these transeptal chapels are square-ended, as at the mother abbey of Cîteaux. That the square form should obtain in England is, of course, by no means strange, it having been the almost universal practice of English Mediaeval architects to adopt the square east end, but that it should have been used at Cîteaux and several of the other early Cistercian churches in France is, I think, exceedingly interesting. At the date of which I am speak-

ing almost all choirs in France were built with circular octagonal or polygonal apses with ambulatories and radiating chapels. It was, therefore, a very marked departure from precedent, when the monks of Cîteaux built their churches with a square east end, and one cannot help recollecting, in connexion with this fact, that the prime mover of the reform was an Englishman. May it not have been that this austere man, retaining a predilection for the square-ended churches of his mother country, induced his followers to adopt this sterner form when they founded with him a new monastic order of such severity as the Cistercian? It is certainly the case that when a body of men, or a nation, or a race have been possessed very strongly with one idea, they have always expressed this idea in their architecture, and I am much inclined to believe that this square-ended church was to the Frenchmen of that day a very definite external sign of the severe life of self-abnegation and fasting which they were desirous of living.

Before quitting this part of my subject, it would perhaps be well for me to give translations of one or two of the rules which bear most directly on the construction and decoration of their churches, to show you that this subtle connexion between their architecture and their lives did not altogether escape their notice. Here is a rule which immediately stamps a peculiar character upon all early Cistercian churches:—

"Let not stone towers for bells be built, nor wooden ones of immoderate height, for they detract from the simplicity of the order."

I believe many of the French Cistercian churches show signs of having originally possessed these wooden bell-turrets; but as I have not seen any Cistercian work abroad I cannot speak from experience on this point. In England, however, even from the earliest times, this rule seems to have been neglected; for at Kirkstall, founded in the year 1145, the lower story of the tower over the crossing is of the same date as the rest of the church; and at Fountains there are evident signs of the same sort of low twelfth-century stone tower having once existed.

Next as to the bells themselves it was thus ordered:—

"Let the bells of our order be managed that one only shall be struck at a time, never two together."

Thus preventing the introduction of anything approaching a joyous peal.

But it is with regard to the interior arrangements and decoration of their churches that their rules are most explicit. Take the following, for instance:—

"We forbid sculptures or pictures to be executed in our churches, or in any of the offices of the monastery; because, whilst by such things is intended the exercise of good meditation, or the ordering of a religious gravity, these are too often neglected; but painted crosses which are of wood, we may have."

Again,

"Superfluities and remarkable curiosities in sculptures, paintings, buildings, pavements, and other such like things, which sully the ancient purity of the order, and do not agree with our poverty, we forbid to be made. Also pictures, except the likeness of the Saviour. Let the father abbots diligently inquire into all these matters in their visitations, and cause them to be observed."

They also forbade the use of stained glass in the following words:—

"Let white glass only be used, excepting in abbeys which formerly belonged to another order; these may retain what they had before the time of their conversion."

It is also clear from the following that they restricted the number of candles to be used in their churches:—

"When the feast of any saint shall occur, it is lawful to burn the light of a lamp or of a candle at the altar chiefly consecrated in his honour."

There is also a rule forbidding that any but kings, queens, or bishops should be buried in their larger churches; abbots and those who died after having been called to the abbacy might be buried in the chapter-house; and the common monks were interred in the cloister quadrangle; the *conversi* and people who died in the *hospitium* were no doubt buried in the larger graveyard in the immediate neighbourhood of the abbey.

Now, all these rules which I have enumerated,

and many others which I cannot now give you, point most clearly to the strong desire which these old Cistercians had to keep out of their churches and monasteries everything which could hinder them from living what they considered a holy life; and it is interesting to notice in how many respects they objected to just those things which the Reformers of the sixteenth century also waged war against,—stained glass, sculptures, paintings, and superfluities of all sorts; but one cannot help regretting that the great sixteenth-century Reformation was not carried on in the same charitable spirit as its less stirring prototype in the twelfth century was effected. The latter, instead of causing the destruction of hundreds of ancient monuments and the mutilation of nearly all had, on the contrary, the effect of raising up one of the grandest styles of architecture which the north-west of Europe can boast,—a style which, depending as it did entirely upon breadth of design and nobility of proportion for its beauty, was always productive of buildings of the first order.

And herein I cannot help thinking that we as nineteenth-century architects may learn a very useful lesson, namely, that richness of detail is not by any means necessary to the production of beautiful buildings; on the contrary, I believe that unless the general design of a building be beautiful, the more detail which is added the less satisfactory will be the result. Elaborate detail added to an ill-designed building merely suggests waste. It may be as near perfection as possible in itself, but the beauty of individual features cannot impart beauty to a building any more than a perfectly-formed nose will make a man handsome if the rest of his face is crooked and out of proportion; whereas if the general outline of a building be good, and the proportion of its various parts to the whole and to each other be satisfactory, then, depend upon it, it is quite unnecessary to adopt elaborate carvings and minute details; for the beauties of proportion and harmony are quite sufficiently great in themselves to satisfy the human eye, and without them it can never receive pleasure. It is also very evident that on seeing a building for the first time one ought to be struck by the beauty of the whole rather than of the parts, because the latter exist but for the former, and therefore ought always to be subservient to it. But do not for a moment suppose that I care little what detail is added to a building so long as good proportion is given to the whole,—that would be to lose sight of quite half of the teaching of Cistercian architecture; indeed, unless details are very carefully attended to, no truly satisfactory result can be attained, because harmony will be lost; I do feel very strongly, however, that in the present day there seems to be a great inclination on the part of architects to be careless of the general outline and grouping of their buildings, hoping that defects of this nature will be atoned for by elaborate and often unnecessary carvings, the beauty of which is unquestionably great, and, owing to the increased knowledge on these subjects, is fortunately easy to obtain. But not to detain you too long on this point, which, after all, is a great digression from my subject, I will only say further that, as it seems to me, the first thing to be aimed at in making a design is good proportion, and if we obtain this we need have no misgivings as to the result of our work, however little money we may have to spend on elaboration; while, should it ever be our good fortune to be able to spend money freely on any of our works, it will then be in our power to add the charms of elaborate detail to a building which even without them would have been beautiful.

As I said just now, the choir of an early Cistercian church is always short, and, I think, we have now seen enough of the simplicity of the order to account for this. It was, no doubt, because they admitted only a very plain ceremonial at the altar, which would better accord with the general simplicity of their life; but in the thirteenth century, a little more than 100 years after the foundation of the order, they got tired of this restriction, and in England, as well as in other countries, we find Cistercian choirs of very considerable proportions of this date.

Look at the plan of Fountains, for example, and you will see that the area of the choir, as reconstructed during the first twenty-five years of the thirteenth century, with its eastern transept, called the Chapel of the Seven Altars,

amounts almost to two-thirds of the area of the nave and transept. This late choir also is provided with north and south aisles, one of the original transeptal chapels on each side having been destroyed to admit of this. Of course, in some ways this extension of the choir must be looked upon as an improvement. It was in itself very fine, but I think any one who has seen the original twelfth-century choir at Kirkstall must have been immensely impressed with its solemn grandeur, which to me always seems to harmonise better with the rest of the Abbey than does the extensive choir of Fountains.

Among the sketches I exhibit is one showing my idea of the exterior of the original choir of Fountains Abbey, with the central tower and north transept; and another showing the interior of the existing choir restored. They are both the result of a considerable amount of study, and are not simply the wild imaginings of an architectural student.

The exterior design of the nave consists merely of a row of semicircular-headed clear-story windows above, and a row of similar aisle windows below, divided from one another by the rather shallow aisle roof. Pilasters of slight projection divide both clearstory and aisle into bays.

The interior of the nave is not less severe than the exterior. The nave arches, moulded in the simplest manner possible, are supported on plain cylindrical columns, with shallow capitals and bases, and between the arcade and the clearstory there is merely a piece of blank wall surmounted by a plain bull-nosed string-course, upon which the jambs of the inner arches of the clearstory windows rest. Yet every one must acknowledge that it is a first-rate piece of architecture, notwithstanding this almost childish simplicity. It seems probable that the nave and transepts were covered by means of semicircular wooden ceilings, but the original choir was probably vaulted in stone, as at Kirkstall. The nave aisles had stone roofs of a very peculiar character; transverse semicircular arches springing from corbels inserted about two-thirds up the nave piers and at a similar height on the aisle walls, supporting transverse pointed barrel vaults, which followed the line of the main nave arches; it was, in fact, little more than a prolongation of the nave arch to the aisle wall.*

REVERSIONERS AND THE ACQUISITION OF RIGHTS TO LIGHT.

It is to be hoped that the architectural world has not forgotten that the Committee of the Institute on the law of light and air is still investigating this subject. The matter is one of so much importance that all those members of the architectural profession who have had much to do with it should certainly endeavour to lay before the committee as clearly, but as concisely as possible, the opinions which they have formed on the points under consideration. There is one aspect of this subject which deserves a good deal of consideration,—one portion of it which certainly seems to require a change. We refer to the law as it exists in regard to the acquisition of an indefeasible right to light by the owner of a dominant over a servient tenement when the latter is in the occupation of a leaseholder. As the law now is, the owner of the dominant tenement under the circumstances stated can acquire a prescriptive right to the light in question against the reversioner of the servient tenement, although the latter may not have been in a position to prevent such acquisition. For the law has laid it down that if the leaseholder will not permit the reversioner to come on the land for the purpose of preventing the growth of the easement in question, then the reversioner has no remedy and cannot prevent the acquisition of a right which may be seriously detrimental to the value of his property. It is impossible to suppose that when the Legislature passed the Prescription Act they could have contemplated the serious consequences which might ensue from it to so many owners of property. That the point to which we allude is one of real hardship there can be no doubt, because it is notorious that these rights are acquired almost without the knowledge of the person in whose favour they grow. A house-owner opens a window which obtains its light from adjoining

ground belonging to an adjoining owner, but the actual possession of which belongs to a leaseholder. The latter hardly takes note of the new window; it is no annoyance to him, and it rouses nothing more than the feeble interest which many apparently unimportant doings of neighbours have for neighbours. The leaseholder is a good tenant, and perfectly friendly with his landlord, and the latter, as he receives his rent punctually, pays little attention to the property. Time goes on, and the lease is ended and the reversioner thinks it desirable to improve and enlarge his house, and thereupon begins work with this object. The owner of the adjoining house, whose once new window has now attained the age of twenty years, is disgusted to find that his neighbour's improvements are likely somewhat to darken the room in which this window is placed. He growls, and then prepares a letter to the neighbour on the subject, who returns a civil reply, regretting that the improvements inconvenience his neighbour, but states at the same time that they are essential to the well-being of the property in question. Then the neighbour, who is about to submit to the inconvenience, thinking to himself he should have made some arrangement with the adjoining owner years ago, mentions the difficulty to a friend of his, an architect, with a view to the lightening of the room in question. The architect at once asks him how long the window has been in existence, and the age thereof is given. The architect equally promptly informs his client that he can legally stop the improvements of his neighbour, as they are a substantial infringement of an indefeasible right which he has acquired by a twenty years' user. And then an architect and a lawyer are forthwith consulted by the owner of the servient tenement, and he finds to his cost that he must make some kind of terms with the owner of the dominant tenement.

Sometimes a tenant may from some cause or other refuse to allow his landlord to enter on his premises, with the object of preventing the acquisition of a right on the part of a neighbour by lapse of time. But these illustrations sufficiently show that reversioners may often be placed in situations of great difficulty. It is quite impossible to keep a strict eye on neighbouring windows and openings, and in many cases the owner of the dominant tenement is unaware that he is actually gaining an indefeasible title to light through a particular aperture. It is only when something pointedly draws attention to the fact that he becomes aware of the right which the law is so kindly creating for him. It may, of course, be said that any prudent landlord would take sufficient notice of his property to prevent the growth of hostile rights of light. But the fact must be borne in mind that in practice many reasons prevent landlords from so doing, and, indeed, as we have endeavoured to show, both the owner of the dominant and the owner of the servient tenement are often ignorant of the gradual growth of this important right, one as favourable to the owner of the dominant, as it is burdensome to the owner of the servient tenement. There can be no doubt that any man of considerable practical experience must be able to recall more than one case of hardship arising from the acquisition of rights against reversioners. Of course, if the committee of the Institute were to recommend a repeal of the Prescription Act, so far as it concerns rights to light, there would be no more difficulty on the point. But if they should not go so far, then some kind of practical way of dealing with this part of the subject will have to be devised. Of course, so far as regards actual indefeasible rights which have become such by virtue of the Prescription Act, these must be respected. But either as regards new windows altogether, or windows in respect of which rights are in process of creation, but have not become indefeasible, some method of doing justice to all parties must be found. Without putting the following plan forward as an absolute panacea for this evil, it yet seems to be one which may fairly be considered an equitable remedy. We would propose that the owner of the dominant tenement at the time new windows were made, or at the time when this new arrangement came into force as regards windows then in existence, but which had not yet an indefeasible right to light, should be bound to serve on the occupier of the servient premises a notice stating that after the lapse of the regular prescriptive period he would claim to have an indefeasible right to the win-

* The remainder in our next.

dows in question. This would give full notice to the owner of the servient tenement, and it would then remain for these two parties to make such terms as should be convenient to both. In the case of new windows in the future it can scarcely be doubted that it would result in some arrangement being made before the new building was erected, or new windows made in old structures. Such arrangements would lessen many bitter disputes, some of which culminate in litigation, others in what has been called the "brutal" mode of preventing the acquisition of light by blocking up windows with boards. We have carefully guarded ourselves against saying anything for or against the main question of the repeal of the "light" sections of the Prescription Act; but if this is not done, the point we have here touched on must be dealt with in a manner to do justice to all parties, whether interested in the dominant or servient tenements.

THE PROPOSED SALE OF THE FRENCH RAILWAYS, AND THE STATE AND THE RAILWAYS IN FRANCE AND IN ENGLAND.

To sell a poor property for a large price is usually thought to be a good stroke of business. But there is such a thing as being too clever; or, at all events, as so acting as to merit the reproach. It is to be feared that the proposal now before the world for the sale of the French railways is a case of this kind. The lines in question, of course, are not the lucrative lines conceded to the great companies. They form a minor network, of about 1,000 miles in length, belonging to the State. They have cost about 15,000,000, per mile, and the gross earnings only amount to about four per cent. on this capital. The net earnings only amount to twenty per cent. of the revenue, so that the return on the capital invested in these lines is only at the rate of about seven-eighths per cent. per annum. The contrast between these State-managed lines and those of the six great companies is of the most striking kind. On 15,000 miles of railway in 1877, which had cost about 23,000,000, per mile, the gross income was nine per cent., the net income 5.56 per cent. all round, and the loan arrangements were such as to allow, in some cases, a dividend of more than ten per cent. on the original share capital.

These state-owned railways, therefore, constitute a property of but small intrinsic value compared to the cost of construction. At the end of 1879 this cost was returned at a little under 15,200,000, on which the net profit for the year was only 131,000. As the price of 41 per cent. *rente* on the Paris Bourse at the commencement of the year was a little under 106, the proportionate value of the stock in question is not much more than three millions sterling. Thus, what is called the "Sale" by the Government of these lines, for from 16,000,000, to 17,000,000, is, in fact, a disguised loan. The arrangement can only be carried through by means of a guarantee of interest on the part of the Government. In point of fact, in the last returns now before us, we find a sum of 45,970,363 francs entered as paid by the State. We apprehend that there can be no doubt whatever that it would have been more economical for the French Government to sell their railways, out and out, for what they were worth, and to borrow any further sum of which they are in need on the usual market terms, than to enter into an engagement which requires so much explanation in order to be understood by the public; involving a permanent charge on the income of the country, the full advantage of which the State fails to realise.

The industrial interests of England cannot afford to be left in ignorance of the cost of carriage and of communication in other parts of Europe. With the beginning of the year we witness the gathering together of railway proprietors and representatives with a view of bringing to "bear in a forcible manner arguments which no minister, to whatever party he belonged, would be able to resist." On the other hand, the recommendations of the Select Committee on Railways, as well as of that on canals, have yet to be brought before Parliament, as the basis of legislation. The great point necessary is for Parliament and the public to be fully informed, not only of the facts and cost of transport within our own shores, but of those which prevail throughout Europe. By obtaining full information on this subject

we are convinced that the Railway Shareholders' Association would do much more to increase the net income of the railway proprietors, and at the same time to increase the real wealth of the country, than by following the course apparently indicated by the chairman of the meeting at the Cannon-street Hotel on the 3rd current. Our railway dividends are not what they ought to be, and they present a very unfavourable comparison with those of the great French railway companies. It is important to the English public, first, that this fact should be fully made known, and secondly, that it should be traced to its true cause. The goods and passenger mileage traffic on the French lines is almost exactly the same, on an average, as that on the English lines. The latter, however, are constructed at a vastly higher cost; an expense incurred in order to carry that poor-paying mineral traffic, for which the French statesmen are doing their utmost to provide inland waterways. This should be made known to English shareholders, at the same time, that they should be enlightened as to the costly and mischievous results of State ownership, and State working of railways not only in France, but in Italy and in Belgium. Full, free, impartial, and honest information would withdraw the "railway question" from the list of questions; as it would enable a competent judge to understand the true principle of securing the best returns both to the railway customers and to the railway proprietors.

THE RESTORATION OF THE LIEB- FRAUENKIRCHE, AT ARNSTADT.

THE authorities of the principality of Schwarzburg-Sondershausen have since 1878 been engaged in the restoration of the above structure, which has gained a certain renown beyond the limits of Thuringia. In a detailed statement contributed to the *Deutsche Bauzeitung* by Herr Stier (the architect in charge of the work), it is stated that the church comprises two parts of distinct origin; a longitudinal portion, built in the Romanesque style, and a high choir structure with three chapels and a transept, dating from the Gothic period. Between these two portions rises a massive tower, of the later Gothic period, while the west front is ornamented by two smaller towers, differing in height and construction; one displaying Romanesque features and the other Gothic forms.

The total internal length of the Romanesque nave is 90 ft.; the forms of this older part being very simple. It is only the portals in the north and south fronts, and the larger portal in the west front, which show any richness of detail. Notwithstanding the plainer features of the interior, it is considered that these portals and the buttresses on the side walls indicate a period of construction not earlier than the end of the twelfth century. This supposition is likewise confirmed by various historical facts. It is conjectured that the church at first possessed a Romanesque choir, which was replaced by the more recent Gothic erection.

The southern tower of the west front is spoken of as being a model for a Romanesque church-tower of moderate dimensions. It commences with a short square portion which rises from the compact mass of the façade, and above this are two octangular stages. A high massive stone point completes the tower, which is spoken of as being artistically matured in its general plan, as it is perfectly carried out in its separate details. These latter portions of the work indicate the fact that workmen were occupied at the same time who had respectively acquired skill in the two distinct styles of architecture already referred to. So far as traces exist of the internal ornamentation of the building, it would seem to have been in harmony with the exterior.

Remains are still preserved of stained glass windows, belonging to the fourteenth century, the colours and designs of which are specially good. It would seem that the church at one time possessed twenty-two altars. At present the principal decorative features of the interior are connected with the monuments of the Schwarzburg princes buried in the northern choir-chapel.

In the course of time various wooden erections disfigured the church, and from the time it was used as a war depot in 1813, its architectural condition gradually became a

subject of discussion. In 1843 some measures were taken with a view to a restoration being carried out, but with a want of technical knowledge on certain points of importance. Thus the middle tower was supported in a defective manner, and the stones of the exterior which had given way through frost, were bound together with iron clamps. Apart from the rough nature of this plan of operation the rusting of these fastenings served to promote the decay of the structure.

The idea of the present restoration originated in 1855, but from various causes the preliminary steps progressed slowly, and it was not until 1878 that active measures were taken, by which time the Government grants and collections from other sources amounted to about 7,500. The work undertaken included the following restoration: the choir (together with the supplying of the unfinished crownings), the middle tower, the western front, the western portal, and the north and south towers. The available financial resources having been exhausted by the works now completed, the Landtag of the principality has voted a further sum of 4,000, which will be required for the restoration of the vaults on the south side, the flooring, the doors, and finally for the glazing of the windows. A further sum of 2,500, will, it is hoped, be raised by collections, and by a lottery. This will be devoted to the internal decoration, the pulpit, organ, and other requirements.

KÖNIG'S PROCESS FOR PURIFYING WATER.

THE above process (described in the *Jahrbuch der Pharmaceutischen Centralhalle*) is founded upon the general principle that the evils which have to be remedied in such cases arise from the following causes:—

1. From the high proportion of suspended organic matters or muddy substances in flowing water; dye stuffs being also present in the refuse water from dye-works.
2. From evil-smelling products of decomposition (sulphide of hydrogen, sulphur combinations, or other reduced combinations).
3. From the partial or total want of oxygen.

The mode of purification depends entirely upon local circumstances and requirements, but the general principles of the systems in use are said to be (1) the use of clarifying ponds, into which chemical agents are introduced to facilitate the deposit of the organic particles; (2) the irrigation of meadows either directly or after purification in the clarifying ponds; and (3) the use of graduation-houses, or filtering through coke, sand, &c. The basis of these various methods is the removal of organic substances, and the introduction of air in such a manner as to cause the oxidation of the decomposed substances. It is remarked that clearness is by no means an indication of water being pure, as the suspended muddy substances are by no means as dangerous as the decomposed substances in a state of solution.

Although the purification of water is effected by irrigating meadows with it, the eventual saturation of the earth and the space required for the operation render it advisable for alternative processes to be adopted, the operation of which resembles the former method as closely as possible. Thus the saturation of water with oxygen is recommended by Prof. König as being most successfully effected by spreading out the water in as fine a jet or in as thin a layer as possible. This result is arrived at by means of graduation-houses, but, on account of the expense connected with this system, trials have been made as to the use of wire-netting for allowing as large a proportion as possible of the water to come into contact with the air, this being specially promoted by the air acting on both sides of the thin layer, which, besides, is continually broken up at the cross wires.

The trials were made with a timed wire netting, about 11 ft. 6 in. in height, bent in various directions in such a way as to increase the effective surface. Spring-water was used, to which refuse-water from a factory was added, as well as water containing sulphide of hydrogen. The water contained per litre (1½ pint):—

	Before the operation.	After the operation.
Oxygen.....	18 cubic inch.	54 cubic inch.
Sulphide of Hydrogen	31 grain Troy.	0013 grain Troy.
Sulphuric acid present		
or formed.....	73	1.09

The process of oxidation is, therefore, an active

one, and the bad smell of water is also lost after this process. Water containing an abundant quantity of organic substances must first be purified in a clarifying pond.

The height of the wire netting is in proportion to the composition of the refuse water, the height varying according to the quantity of decomposed substances. If there is '30 grain Troy of sulphide of hydrogen per litre (1½ pint), a height of 13 ft. to 16 ft. suffices. The width of the wire work is dependent upon the quantity of refuse water. The netting is stretched between wood or iron standards. A netting 1 ft. 7½ in. wide will, it is said, allow of 6 or 7 litres per minute being treated.

THE WROUGHT-IRON EXHIBITION.

We mentioned the other day, in describing and illustrating some of the wrought-iron work collected and arranged by Mr. A. Newman, at 175, New Bond-street, that he was desirous to have an opportunity of explaining and commenting on the specimens of old ironwork, and their qualities of design and treatment, to a party of practical workmen. This kind of meeting was arranged subsequently, and on Saturday last Mr. Newman conducted a large party of workmen from various firms over the exhibition, and pointed out the best specimens and their special excellence of execution, to the great interest and pleasure of his hearers. Some clever hands, which only want good suggestions, good models, and good ideas to turn them to the best account, may, we hope, have got a new light on the capabilities of their craft from such an opportunity of inspecting an exhibition containing many examples of the finest type of design and workmanship.

Mr. Newman invites workers in iron to visit the exhibition on any Saturday afternoon this month.

THE ARCHITECTURAL MUSEUM.

On Wednesday evening the prizes gained by the students of the Art School, the classes for which are held at the above Museum, were distributed by Mr. Beresford Hope, M.P., in presence of a considerable gathering of the students and their friends. It appears that the evening classes are attended by 112 pupils, and that altogether the students who receive instruction reach the respectable number of 150. The specimens of their work which had been successful in one form or another were displayed on a screen. They were some eighteen in number, and comprised half a dozen paintings and drawings from the life; a couple of sepia drawings from casts of ornament; a design for a carpet; and others for chimneypieces and silversmiths' work. It cannot be truly said that the level of excellence attained was at all a high one. The tone of the proceedings was throughout apologetic. No medals had been received for the work of the past session, and the disappointment was a real one, and not to be explained away by all the efforts of the orators who addressed themselves to the ungracious task. Indeed, the gloom was deepened by the reiterated assurances of the successive speakers, who dwell upon the fact that there was really no cause for despondency. A gentleman present had the good fortune to introduce Macaulay's New Zealander to the company, and predicted that the colonial antiquary of the far-off future would find nothing in the way of ornamental art bequeathed him by the adherents of Queen Anne to compare with the bequest of our Mediæval ornamentalists. The sentiment was loudly applauded, and Mr. Beresford Hope, with the tact of a practised speaker, seized upon the incident and made it the occasion of some good humour and not ineffective railery at the expense of the Queen-Annists and to the glory of that Mediæval art by which he was then surrounded. He was upon perfectly firm ground. Nothing can ever detract from the unsurpassed beauty of those examples from Ely and York, Lincoln, and Chartres, with which the walls of the Architectural Museum are adorned. And no one in his senses holds up the present mode as equalling it in artistic merit. But it does not seem to have occurred to any of the speakers that in this home and stronghold of Mediævalism not one of the designs then before them was Gothic in character and motif. Their children shall be their judges. The fact is, the Museum has become an anachronism. At its foundation nearly the

whole architectural profession was agreed that Gothic was your only wear. Now the adherents of that creed are narrowed to a sect. They are suffering for the sectarian spirit in which they conducted their work, and, having excluded all but a certain phase of art, have been in turn excluded. If the Museum is to live and increase in usefulness it must become catholic in its tastes, and encourage its children to a study of art in a wider sense than heretofore.

The address which Mr. Beresford Hope delivered was full of wisdom and point, and an accidental failure in one of the prize competitions gave him an opportunity to bring home to the students a subject of the first importance,—the training of the eye to receive and retain impressions, which the hand should, unassisted, express. This is the great defect of all modern art-teaching. Mr. Hope referred to the well-known case of Houdin, the conjuror, who was trained by his father to notice and remember all the articles in a shop-window as he passed it at a walking pace. By degrees he could bear in his memory hundreds of small articles at which he had only given a rapid glance, and he could not only recount them, their size, figure, and colours, but their relation to each other and their distinguishing minutiae. Mr. Hope might have referred to the apposite instance of Hablot K. Browne, who never in his life made a study of any of the objects which he drew with so much truth and facility. In the drawing of horses he was supreme; but every horse was drawn from memory after leaving the park or the hunting field, and not one nor any part of one from anything but passing observations. The modern practice reverses all this; and our youth pass endless hours in front of their model only to find themselves powerless in its absence. The schools of design all over the country can produce thousands of lads who can draw and shade and colour anything they see; but who have no more invention than those who have never given an hour to the matter. We are convinced, from some personal acquaintance with the subject, that of all the exercises to which youthful aspirants can devote their attention, none would be so valuable as the reproduction from memory of the facts of nature and art acquired by previous observation. Mr. Hope was equally interesting on the proper scope and aim of art, affirming that art and learning were concomitants; that the ignorant artist was an imperfect artist; and although we should have been better pleased if the artist had not been looked upon quite so exclusively as the interpreter of the work of the historian and the poet, and had been credited with the mission of interpreting nature at first hand, yet there can be no doubt that the address was well calculated to give the student higher aims, and to put him in the way of becoming an artist of independent powers.

Much praise was unanimously, and, no doubt, deservedly, given to Mr. Druce, the head-master of the school, and there is reason to believe in the literal truth of the statement that the general work of the school is quite as good as could be expected considering the small encouragement it receives.

An episode in its history of the past year must not be passed over without record. Mr. Hope has, with his accustomed generosity, given a prize for the greatest number of individual attendances in order to encourage that continuous study which is necessary to success. Two pupils appear to have been rivals for the distinction: one made 120 attendances during the session; the other made 117, and then fell ill. The successful student insisted upon sharing the reward with his disabled competitor, and upon appearing to claim his moiety of the prize was greeted with genuine applause, which was turned to account by Mr. Hope in a few graceful and happy sentences which impressed all hearers and will doubtless be remembered by the youth to whom they were addressed, as a gratification far beyond what he could have enjoyed if he had wrapped himself in an accidental and selfish victory over so worthy a rival. Mr. Seddon, Mr. Ferrey, and some other staunch and tried friends of the Institution spoke as to its successes in the past and with hope for its future,—a hope which its numbers might justify, but which the few and indifferent specimens of work before the meeting scarcely warranted.

There is room for question whether the museum, *qui* museum, and apart from its function as a school of art,—has not had its day, and whether the large and choice collection of

casts from the best Mediæval art the kingdom affords would not be more usefully accommodated at South Kensington. It need hardly be added that we say this from no want of goodwill towards the Architectural Museum, in which the *Builder* has been interested from the first; but the experience of successive years seems to place it past doubt that a mistake was made in the situation chosen to begin with, and that its chances of success now are more than problematical.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

At the meeting of this Association, held on Saturday last, in the Library of the Social Science Association, Adelphi, Mr. Jerran in the chair, the discussion of two papers read at previous meetings, on the tenure of office and the position of sanitary inspectors,* was resumed.

The Chairman, in re-opening the subject, remarked that the work of sanitary inspectors was rendered very difficult when there was an unwillingness on the part of sanitary authorities to carry out the law as it stood. That this unwillingness did exist was shown by the fact that Sir Charles Dilke had recently thought it necessary to call the attention of certain authorities in London to the necessity for carrying out the Sanitary Acts of 1866. It was most desirable that sanitary inspectors should go fearlessly about their work, and that they were not able to do at present. They had not sufficient power, and their positions were not sufficiently strong, to enable them to see the law carried out as it should be, while they had inactive but authoritative people over their head.

Mr. Sherborne (Chelsea) said as far as his district was concerned, the inspectors were more or less free agents. It seemed that one of the Acts of Parliament had been lost sight of,—the Act of 1874, which gave the Local Government Board power to compel any metropolitan district, or any district with more than 10,000 ratepayers, to enforce the third section of the Sanitary Act, that which was called the Lodging-house Section. The Board had now drawn attention to that Act, and that was one reason why the urban and rural inspectors should be on a level. He moved a resolution declaring it to be desirable that the position of the metropolitan urban, and rural inspectors should be assimilated.

The motion was seconded by Mr. Poulson, inspector of the Tottenham district, who remarked that he had never found the Board he worked under opposed to sanitary reform.

Another speaker, a rural inspector, said some inspectors refrained from reporting the bad state of property lest they should lose their appointments, and, being met by cries of "Name," he declined to give a name, but said that after his appointment to the first district he inspected, which was in Worcestershire, he was distinctly told that the less he did the better it would be for him.

Another speaker, a London inspector, said, as far as London was concerned the inspectors had no reason to complain, and that it made no difference to him whether the property he had to report belonged to a vestryman or to any one else.

Ultimately the resolution was agreed to, as was also another declaring it to be expedient that the appointment of all officers should be approved of by the Government sanitary authority, and that no officer should be dismissed by any local authority without final appeal to and approval of the Government sanitary authority.

A paper on the sanitary inspection of the dwellings of the poor was then read by Mr. T. Buckworth, sanitary inspector of St. Saviour's, Southwark, in which he pointed out that the district of which he was the inspector was one of the poorest on the south side of the Thames. On the 11th of December last an intimation was made that the President of the Local Government Board desired to inspect the sanitary condition of the district, and when Sir Charles Dilke came to visit the dwellings of the poor in this part of London, the premises he visited were found to be in a worse condition than they had been for some time previously, because, although prior to his visit certain sanitary works had been carried out, and the houses put into habit-

* See last volume of *Builder*, pp. 634, 761.

able condition, the tenants, through their want of necessary and proper knowledge, had produced, a great change in the state of their tenements. As showing the ignorance, carelessness, or worse, of some of the occupiers of this class of property, Mr. Buckworth stated that he had repeatedly found scrubbing-brushes, house-flannels, pieces of broken crockery, and empty tins such as are used for condensed milk, in the S bend of the soil-pipe, the result being, of course, the stopping up of the water-closet, and the creation of an abominable nuisance. The question of overcrowding, Mr. Buckworth admitted, was a remarkably difficult one. The Torrens Act and the Act introduced by Sir Richard Cross had been the means of greatly improving the dwellings of the poor. It was no use, however, to remove a nuisance in one part of a district and force it to another, and his experience pointed to a system of erecting dwelling-houses for the poor. In the parish of St. George-the-Martyr, where dwellings had been demolished, the ground on which they stood had not been utilised in the erection of new and better sanitary dwellings, but was still vacant. Thus 300 families had been turned out to seek shelter elsewhere and to overcrowd another district. The supply of water in all districts should be on the constant system and under the supervision of a high recognised authority. The discussion upon the paper was postponed.

BRISTOL AND CLIFTON JUNIOR ARCHITECTS' SOCIETY.

THE annual general meeting for the election of officers, &c., was held at the Academy of Arts, on the 4th inst. Mr. W. E. Hill (Member of Council) presided during the earlier part of the meeting, and Mr. J. C. Moncrieff, A.R.I.B.A. (vice-president), during the latter part of the meeting. The following gentlemen were elected officers for the year 1884:—President, Mr. Chas. F. Hansom, F.R.I.B.A.; hon. auditors, Messrs. Alfred Hartford and F. E. L. Harris; hon. secretary and treasurer, Mr. George E. Ford; assistant hon. secretary, Mr. E. C. Howell; Council, Messrs. H. Hart, W. E. Hill, G. G. Macpherson, W. H. White, R. C. Sconce, and F. B. Bond; Mr. Hansom being chosen president for the third year, and Messrs. H. Hart, G. G. Macpherson, W. E. Hill, and W. H. White, being members of the retiring Council. It was decided that the annual dinner should be held in the latter part of January.

Mr. George E. Ford (hon. sec.) announced that papers for the ensuing session had been already promised by Messrs. J. C. Moncrieff, G. E. Ford, W. E. Hill, and E. C. Howell, and that the Council were making arrangements for a complete sessional programme of papers of a very elaborate character, and which would help to make the session 1884 a complete and thorough success. It was announced that satisfactory arrangements were being completed for the publication of the newly-instituted "Journal of Papers," and that the first number, containing the paper by Mr. F. B. Bond on "Perpendicular Architecture," recently delivered before the Society, would soon be published. The rules for debates and other matters having been decided and confirmed, votes of thanks to the chairman terminated the meeting.

BREAKAGES IN GAS-PIPES.

PROFESSOR VON PETTENKOFER, of Munich, lately delivered a lecture in which he quoted various facts with reference to the manner in which the gas used for illuminating purposes may cause serious injury to the health of residents in a house, if it escapes into the ground and makes its way into cellars, &c. Experiments made at the Munich Hygienic Institute have demonstrated the fact that there is much more danger from this cause in winter than in summer. This fact is explained by the assertion that the cellars or basements being artificially heated in winter, attract the gas from the earth with increased force. Under such circumstances, the gas which has escaped is capable of producing disastrous effects at a distance of 100 ft. from the point of fracture.

Attention was also called to the fact that in its passage through the earth, gas loses its smell whilst retaining its proportion of carbonic oxide. This dangerous feature, which prevents the timely recognition of the danger, only ceases

when the earth is so thoroughly impregnated that it has lost its capacity of absorption. Thus an escape of gas underground is far more dangerous than a similar occurrence in a house, as the smell in that case warns the inmates of what has happened. It was suggested by the lecturer that when an escape of gas occurs underground, the company should, on being apprised of it, inform the residents within a certain distance so that they might open the windows of basement stories and thus prevent any accumulation of carbonic oxide in the lower rooms of their houses.

BRIGHTON RAILWAY STATION.

FOR nearly two years extensive works have been in progress at Brighton railway station that are estimated to cost, ere the design is completed, upwards of 100,000l.

Without interruption of the traffic, or disturbance of the original station roofs, a new covering has been erected over them. The station lines and platforms are on a curve which is followed, of course, by the new roof. The main roof is 625 ft. long, and in two spans of 112 ft. each, with an added bay over the goods yard on the eastern side, with a span of 46 ft. This extra space, with its additional platform, is intended for the accommodation of the traffic of the eastern branch of the company's system, which is now kept distinct from that of the main line. An important purpose designed by the alterations has been to dispense with the service of vans in the station; these now take up and deliver their loads in the goods-yard on the lower level, and no vehicles enter the station except such as are connected with the passenger traffic.

The height of the principal roof is 78 ft. from the platform level; it is divided, lengthways, by two rows of columns, 26 ft. high, into twenty-one bays. The bays are octagonal, the pedestals cylindrical, 3 ft. in diameter, and the shafts of four columns clustered, giving a quatrefoil section. The principals of the roof are elliptical, and spring from the capitals of the columns. The spandrels, of open iron work, have their perpendiculars attached to iron stanchions, 13 ft. high, that stand on the tops of the columns. Warren girders connect the stanchions longitudinally. A louvred lantern, 26 ft. wide, runs along the whole length of the two bays, which are covered in at both ends by double-glazed screens, carried down to a horizontal line between the springs of the arch. The roof contains 110,000 square feet of rolled plate-glass $\frac{1}{2}$ in. thick; it is applied without putty by Mr. T. W. Helliwell, of Brighstone, Yorkshire, on his patented plan. The opaque part of the roof is covered with Vieille de Montagne zinc. There have been 3,000 tons of wrought and cast-iron used in the structure. After dark the station is most effectively lighted by eleven arc lamps, in two rows of five each, and one in the centre of the south end platform; these are fitted up by the Hammond Electric Light Company.

On the eastern side the station has been extended about 25 ft. over the goods yard, and a building has been erected at the front, which has two floors below the station platform level. There is communication with these by an iron circular stair, and for goods by a hydraulic lift, supplied by Messrs. Waygood & Co. The head of water is sufficient for all required purposes, without the aid of steam-power in working the lift. The telegraph business, which employs from fourteen to twenty persons, is worked by the railway in concert with the Post Office Department. In this locality also a building has been erected for the transaction of the business *in transitu* of the Parcels Post. Excellent provision has also been made for the public in lavatory accommodation. The refreshment-room is fitted up in polished pitch-pine, and has the windows filled with embossed glass. A wide public stair with stone steps leads from the station to Trafalgar-street, facilitating communication with the eastern part of the town.

At the western front corner of the station another new building of two stories, devoted to dining and refreshment purposes and accommodation, has been erected.

Northwards from this block of buildings is a range devoted entirely to station purposes, for the accommodation of inspectors, guards, porters, ticket-collectors, head porter, carriage-washers, &c. Other important works for in-

creased accommodation and convenience have been executed at this part of the station. The existing pile that forms the façade of the station will be entirely removed, and the accommodation re-arranged in a reconstructed building.

The works have been designed by Mr. H. E. Wallis, C.E., in conjunction with Mr. F. D. Banister, engineer-in-chief of the Brighton Company; Mr. W. H. Davidson has been in charge as clerk of the works. The contract is in the hands of Messrs. Kirk & Randall, of Woolwich, with Mr. R. Williams as resident manager; the ironwork has been executed by the Patent Shaft and Axletree Company, of Wednesbury. The whole of the very heavy work has been successfully carried out, without the slightest interruption to the traffic, or injury to a single passenger.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

- 5,884. E. M. Wood, Natick, U.S.A. Green-houses. (Comp. Spec.) Dec. 28, 1883.
- 5,897. R. Lofthouse, Beswick. Creating currents of air for ventilation. Dec. 28, 1883.
- 5,933. W. E. Heath, London. Shoring up dangerous structures. Dec. 29, 1883.
- 5,940. J. C. Mewburn, London. Water-closets, &c. (Com. by J. E. Boyle, Brooklyn, and H. Huber, New York, U.S.A.) Dec. 31, 1883.
- 5,949. F. Walton, Twickenham. Wall decoration. Dec. 31, 1883.
- 5,971. W. Brindle and T. Brindle, Upholland. Dressing and ornamenting stone, &c. Dec. 31, 1883.
- 5,988. M. Dray and J. Bernard, London. Baths. Dec. 31, 1883.

Jan. 1, 1884.

- 6. H. W. Frampton, Winchester. Hexagon-framed metal roof, &c.
- 32. H. H. Lake, London. Compound for plastering, &c. (Com. by H. E. Seales, Newton, U.S.A.)
- 38. W. Henman, Birmingham. Sanitary traps.
- 46. E. L. Garbett, London. Fireproof building.
- 52. H. S. Simester, London. Ventilation.
- 84. J. D. Tucker, Bromley. Sliding window-sashes.
- 105. J. Robson, London. Weathering parapet walls, &c.
- 108. T. Jones, London. Ventilators.
- 132. J. S. Sweet, London. Ventilator for buildings.
- 144. H. Thompson, London. Domestic stoves and grates.
- 145. J. Bate, London. Firegrates and stoves.
- 153. R. Stone, London. Manufacture of cement, bricks, &c.
- 164. F. Lea, London. Lever catch-fastener for windows.
- 173. W. H. Baraclough, Edgbaston. Flushing apparatus for water-closets.
- 180. W. H. Baraclough, Edgbaston. Flushing water-closets.
- 187. C. J. Latter, New Southgate. Sheet-metal tiling for roofs.
- 211. G. W. Webb, Reading. Exhaust ventilators.
- 212. G. W. Webb, Reading. Ventilators.
- 256. T. W. Phillips, London. Chimneys.
- 259. H. H. Bridgman, London. Girder and fireproof floor.
- 260. H. H. Bridgman, London. Fireproof floors.

Jan. 2, 1884.

- 294. J. B. Gansby, Birmingham. Ornamental walls, ceilings, &c.
- 296. J. Walsh, London. Window ventilator.
- 298. J. Bruce, Birmingham. Opening and closing casements and ventilators.
- 299. F. Smith, Birmingham. Raising, &c., window-sashes.
- 326. J. Smith, Liverpool. Domestic fire-places and grates.
- 344. W. F. Alcock, Birmingham. Sash-fasteners.
- 354. F. L. Jeyes, London. Ventilators for buildings, &c.
- 365. J. C. Ackroyd, Sowerby Bridge. Raising and lowering windows and sashes.
- 394. W. Parry, Bangor. Bricks for preventing wet from permeating buildings.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

402. E. S. Norcombe, Birmingham. Sash-fasteners.

407. F. T. Bond, Gloucester. Stove for warming and ventilating.

457. J. Jones, Johnstown. Bricks for facing buildings, &c.

469. E. Verity, J. M. Verity, and B. Banks, Leeds. Opening, &c., window skylights and ventilators.

Jan. 3, 1884.

512. J. Dean, Oxford. Self-acting open fire-ranges.

519. J. Petrie, Rochdale. Warming rooms and buildings.

521. W. H. Renwick, Newcastle-upon-Tyne. Water-closets. (Comp. Spec.)

523. R. Pollock and T. H. Herbertson, London. Ventilators.

526. J. H. Charasse, Kingswinford. Wall surfaces.

534. A. W. Lake, London. Fireproof concrete roofs, floors, &c. (Com. by T. Hyatt, Brooklyn, U.S.A.)

556. W. Fairweather, Glasgow. Window-fastenings, &c. (Com. by A. Kasilister, Habana.)

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

December 31, 1883.

4,450. D. Dow, Falkirk. Cooking ranges, &c. Sept. 18, 1883.

January 4, 1884.

4,213. S. B. Sutcliffe, Manchester. Tile hearths, &c. Sept. 1, 1883.

4,342. B. J. B. Mills, London. Domestic heating apparatus. (Com. by Mons. Vaux-Ducruix, Beaujeu, France.) Sept. 11, 1883.

5,281. J. S. Stevens and C. G. Major, London. Spring hinges for doors. Nov. 8, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending January 5, 1884.

2,352. E. S. Shepherd, London, and J. L. Aspinwall, Mantle Vale. Manufacture of artificial stone and cement. May 9, 1883. Price 4d.

Waste slate is used for the manufacture of stone or cement instead of sand, &c.

2,425. T. Parkinson, Blackburn. Water-closets. May 12, 1883. Price 2d.

When the seat of the closet is depressed, the water enters the bottom of a closed cylinder under the ordinary high pressure, compressing the air therein, and when the seat is permitted to rise the compressed water flows into the basin, giving a strong flush. (Pro. Fr.)

2,566. J. H. Johnson, London. Manufacture of sulphate of lime or plaster of Paris. (Com. by P. G. Journet, Paris.) May 22, 1883. Price 4d.

The lime is treated with a solution of sulphuric acid.

IRON AND CONCRETE.

SIR.—The ratio of the strength of concrete to that of iron by weight may be taken as 25 to 1, and not 35 to 1, the equivalent strength given by Mr. Faija; but, although so much additional weight of concrete is required for a beam of a given strength, the cost of concrete (1 in 3) is very little, if any, more than the cost of an iron beam of the same strength. A concrete and iron composite beam has the following advantages over one made entirely of iron. It is not so much affected by heat; it is not liable to lose its strength by continued oxidation; its form is more convenient for structural purposes. A valuable feature is its capability to receive artistic treatment. The comparative absence of this characteristic is the great objection to the use of iron, *per se*, for architectural work. One has only to look around at the hideous engineering creations in iron to become impressed with the difficulty of artistically utilising the great structural strength of iron and steel. The covering of iron with concrete is only imitating nature where she clothes the bony and ugly framework of humanity, to form in one instance the very embodiment of grace and beauty. The evidence given by Mr. Faija to prove that concrete beams are incapable of deflecting without fracture is highly unsatisfactory,—indeed, he (Mr. Faija) hardly appears to be certain the cracks are the result of vibration and deflection.

B. H. TWAITE.

. This interesting correspondence must now close, unless Mr. Tarver, who initiated it, wishes to make any summary of his ideas as to the suggestions brought forward.

SALFORD SEWERAGE WORKS.

SIR,—Referring to the description of these works in your journal of the 24th of November last, I beg to be allowed to state that the civil engineering portion of the works was designed by, and the conception of the whole arrangement is due to, myself. As you correctly state, the object is to deal with the sewage in a similar manner to that adopted at Leeds, the civil engineering portion of which works I also designed.

I was engaged in designing the Salford utilisation of sewage works (after having completed the outfall sewage works) at the time I resigned my appointment under that Corporation, and was afterwards employed by them to complete the designs and prepare specifications, quantities, and forms of tender for letting the works by contract.

The present Borough Engineer has altered the character of the buildings, and has raised the level of the tanks from 16 ft. to 43 ft.

There is not the slightest necessity to pump the sewage to a height of 43 ft. (viz., 27 ft. higher than I proposed, or than I designed at Leeds), or to elaborate the buildings.

The site of the Salford works is identical in character with that at the Leeds works, both as regards strata met with, level of the river, and flooding of lands adjoining the sewage works.

The Leeds works cost 40,000*l.*, to deal with the same quantity of sewage.

The Salford Works, by the alterations to my design, have cost 100,000*l.*, and I estimate, from experience in extensive pumping works, that the extra cost of working expenses will involve the Corporation in an additional expenditure amounting to a sum of at least 1,300*l.* per year.

The outfall or intercepting sewer was also designed by myself, and constructed by contract under my direction, except a short portion of the upper end in progress and nearly completed when I left the service of the Corporation. This sewer is equal to 8 ft. 6 in. in diameter at the outfall, and has more than met the purposes for which it was intended, inasmuch as it takes off the water from the lowest cellar floors throughout the borough when the water in the river is many feet above the streets.

The magnitude of the whole undertaking is such that I cannot afford to stand on one side and allow others to lay claim to my hard-earned experience during the past twenty-seven years. With much greater force does this remark apply now that I am in private practice and have to look to the public at large as my employers, instead of holding an official appointment under a friendly Corporation.

ALFRED M. WOOLER, Mem. Inst. C.E.

ENSILAGE.

SIR.—I want to construct a "Silos" in a gravel-pit, 18 ft. by 12 ft. by 10 ft. deep, having 3 ft. of water in it. Will anyone who has had experience in such matters kindly advise me if the following plan will succeed?

I propose pumping out the water and building a concrete floor 1 ft. thick, and concrete walls 1 ft. thick, and just high enough to flood the whole until the concrete is sufficiently strong to resist the strain of the water. When this is effected, which I suppose will take about two months, I propose to then again pump out all the water, raise the walls in brickwork the necessary height, and cement the whole with 1 in. of Portland cement and sand in equal parts.

My doubts are as to the setting energy under water of Portland concrete, its porosity, and also whether the cement may be relied upon to keep out damp. Any improvements or suggestions will greatly oblige B.

CHURCH BUILDING NEWS.

Govan.—At a meeting on the 28th ult. of the landward heritors of the parish of Govan it was resolved to proceed with the erection of the new parish church, without hall and tower, for the present. The architect from whose plans the building is to be erected is Mr. R. Rowand Anderson, of Edinburgh. The cost of the building (exclusive of the hall and tower, but inclusive of the sum to be paid for an extension of the site) will be 16,189*l.*

Old Radford (Notts).—A carved oak pulpit has been executed for Old Radford Church by Messrs. Jones & Willis, of Birmingham and London. The same firm have also supplied a handsome carved stone and marble reredos to St. Andrew's Church, Netherdon, from the designs of Mr. G. W. Drinkwater, of Oxford.

Gorey, Wexford.—A memorial lectern has just been placed in the parish church at Gorey, Wexford. It is constructed wholly of English oak, and is in the Perpendicular style. A central and richly-moulded, traceried, and carved shaft stands upon a base from which rise angle and supporting columns, attached to the central stem by crocketed and cusped buttresses. Above the capital is a boldly-carved figure of an eagle, whose back and outstretched wings bear the

Bible. The lectern is the gift of the parishioners of Gorey, in memory of the Rev. Charles Hamilton, who, upon the disestablishment of the Church of Ireland, purchased and presented the glebe lands to the parish. The lectern is the work of Mr. Harry Hems.

Lyminster.—On the 27th ult. the newly-restored chancel of St. Mary Magdalene, Lyminster, near Arundel, was re-opened by the Bishop of Chichester, after restoration. The work has been carried out by Mr. Gordon Hill, who has rebuilt the chancel on the north side of the chancel for the double purpose of an organ-chamber and vestry, and has furnished the chancel with seats for the choir.

Holworthy.—On the 1st inst. the Bishop of Exeter re-opened the Church of SS. Peter and Paul, Holworthy, which, with the exception of the tower, has been almost rebuilt. The chancel was reconstructed by the rector (the Rev. G. V. Thornton) in 1881-2, and now the nave has been rebuilt, with the addition of a north aisle, an organ-chamber, and a vestry, from the designs of Mr. Otto Peter, of Lanneston.

DISSENTING CHURCH-BUILDING NEWS.

Thurbridge Wells.—The new Baptist Church here was opened on New Year's Day. It has been erected by Mr. S. Wood, builder, Weybridge, Surrey, from the plans and under the superintendence of Messrs. Lander & Bedells, architects, London. Externally the building is in the Early Decorated style, the materials used being red bricks with dressings of concrete and Bath stone, and ornamental yellow brick facings. The building is warmed by hot-water (low-pressure) apparatus, supplied by Mr. A. T. Young. For ventilation, Tobin flues are attached to the buttresses of the walls. These were supplied by the Eolus Water Spray Ventilating Company. The pews are of low open form, and instead of the usual book slab, there is a "pocket" made of a slanting board. The building seats about 650, of which there is downstairs accommodation for about 370. The total cost of the work, inclusive of the site, is 5,500*l.*

Kidderminster.—The new Meeting House (Unitarian) has been re-opened for service, after undergoing extensive alterations and enlargement. The work has been carried out by Mr. R. Thompson, builder, of Kidderminster, from the designs and under the superintendence of Messrs. Payne & Talbot, architects, of Birmingham. The chapel has been extended some 25 ft., which together with the enlargement of the galleries, provides accommodation for about 200 additional worshippers. The new front elevation is in the Perpendicular style, and is built of a local reddish brown stone, with the buttresses and moulded and carved work in Bath stone. The total cost will be about 2,500*l.*

Clevedon, Somerset.—In our notice of the opening of a new Wesleyan Chapel at Clevedon, last June, we stated that the Committee intended erecting a manse on a portion of the adjoining site. This part of the work has now been commenced, and, when completed, will form, together with the Chapel, one of the most complete Wesleyan Methodist Trust properties in the West of England. The chapel is designed in the Early English style, with which the manse will harmonise. The contract for the latter has been taken at £821, by Mr. W. A. Green, of Clevedon, who was the contractor for the erection of the chapel. The architect for the whole of the buildings is Mr. Herbert J. Jones, of Wellington-chambers, Bristol, and the total cost, including boundary walls, piers, gates, and railings, will be about 4,000*l.*

STAINED GLASS.

Prestbury.—The ancient parish church of Prestbury, near Macclesfield, has been supplied with a two-light stained-glass window by Messrs. Mayer, of Munich. The window, which represents the "Prodigal Son's Return," is placed in the west end of the south aisle, the cost being defrayed by Dr. Richmond, formerly of Stretford-road, Manchester. Prestbury Church is one of the oldest in Cheshire, and has recently undergone restoration from the designs of the late Sir Gilbert Scott, R.A.

Lambeth. It is in contemplation to place two painted windows in the ancient parish church of St. Mary, Lambeth,—one in memory of Archbishop Tait, and the other in recognition

of the services rendered to the parish during the last thirty years by the late rector, the Rev. J. F. Lingham, who has recently resigned the living. Should this project be carried out, every window in the church will then be filled with stained glass.

Brayton.—During the closing days of 1883 two stained-glass windows have been placed in Brayton Church, near Selby, and three in St. Mary's Church, Hambleton. The windows at Brayton are the east window of the south aisle and one of the windows on the south side of the chancel. The windows in Brayton Church are the gift of Mrs. Smith, of Hambleton House. Those in Hambleton Church are the joint gifts of that lady and her daughters. The subjects are taken from the life of our Lord. The windows are the work of Messrs. Ward & Hughes, Soho-square, London.

MEETINGS.

MONDAY, JAN. 14.

Surveyors' Institution.—8 p.m.
London Institution.—Lecture by Mr. Henry Blackburne on "The Art Season of 1883." 5 p.m.

TUESDAY, JAN. 15.

Royal Institution.—Mr. Reginald Stuart Poole on "The Study of Coins and Medals." 3 p.m.

WEDNESDAY, JAN. 16.

Civil and Mechanical Engineers' Society. Paper by Mr. George Simonds on "The Science of Mechanics as Applied to the Fine Arts." 7 p.m.
Society of Arts.—8 p.m.

THURSDAY, JAN. 17.

University College.—Professor C. T. Newton on "The Ionic Monument at Xanthos." 4 p.m.
Portico Museum of Hygiene.—Lecture by Mr. T. Prigdin Teale on "Economy of Coal in Private Houses." 8 p.m.
St. Paul's Ecclesiastical Society. The Rev. W. F. Greeny, M.A., on "Foreign Brasses." 7:30 p.m.
London Institution.—Mr. H. Dixon on "The Nature of Explosions." 7 p.m.

FRIDAY, JAN. 18.

Architectural Association.—Paper by Mr. Aston Webb on "Decorative Plaster." 7:30 p.m.

Miscellaneous.

Fall of a Railway Bridge: Seven Men Killed.—On Sunday morning last a bridge on the London & North-Western Railway, near Coppull Station, between Wigan and Preston, fell in, killing Mr. James Hammond, bridge and station inspector, and six other employes of the Company. The bridge in question carried the high road over the railway, and was constructed entirely of brick, the single arch spanning the line being formed of three rings of brickwork, the backing extending into the solid clay on each side. The bridge was erected by the old North Union Railway Company as long ago as 1837. It seems that latterly there has been some reason to suspect the stability of the bridge, and, although the work of doubling the line between Wigan and Preston (now in progress) could not have proceeded much further without this bridge having to be dealt with, it had been determined to erect, first, a temporary wooden bridge, preparatory to a bridge being placed there with substantial iron girders. The exigencies of the week-day traffic, which is somewhat throttled at this point, pending the doubling of the lines, as well as the convenience of the public using the bridge, made it desirable that the work should be done on Sunday, and, early in the morning, a special train, containing a large staff of workmen from the engineering department, in charge of Mr. Hammond, left Manchester for Coppull. On arriving there they found (according to the report in the *Times*) that the preliminary work of removing earth from the summit and the approaches to the bridge had been accomplished, and as soon as the last passenger train from Wigan had passed active operations were commenced. Some of the workmen were sent on to the bridge to remove the first tier of brickwork, and others, under the personal guidance of Mr. Hammond, who stood in the six-foot way, were proceeding with arrangements for placing the supports required for the temporary bridge when, without any warning, the whole structure fell with a terrible crash, killing Mr. Hammond and six of his men, and inflicting serious injuries on others who were on the line, and slighter but still severe hurts upon several of the workmen who had been on the bridge itself and had fallen with it. The inquest was formally opened on Monday last for the identification of the bodies, and was adjourned until Monday next.

Important Rating Appeal Case.—On the 4th inst., at the West Sussex Quarter Sessions, the magistrates had before them an appeal from the Fathers of the New Carthusian Monastery, at Cowfold, or as it is better known, St. Hugh's, Parkminster, M. Edouard De Gaulejac, the sub-prior, being appellant, and the Assessment Committee of the Cuckfield Union respondents. The case excited considerable interest in the county of Sussex, not only on account of the novelty of rating religious houses in England, but also from the magnitude and unique character of the buildings, which are stated to have cost about 200,000*l.*, and stand on an area of upwards of nine acres. The case lasted the whole day, and scientific witnesses were called on both sides. For the appellant were Mr. J. W. Penfold, of Westminster; Mr. Tewson, of the firm of Debenham, Towson, & Co.; and Mr. Charles Hadfield, of Sheffield, the latter gentleman having to speak more especially to the planning and traditions of the Carthusian and other religious houses. For the respondents were Mr. C. J. Shoppee, architect and surveyor to the Grocers' Company; Mr. Ryde, senior, and Mr. Watney, of the firm of Norton, Trist, Watney, & Co. Mr. Lumley Smith, Q.C., was leading counsel for the appellant, instructed by Messrs. Arnold & Co., of 60, Carey-street, and Mr. Meadows White, Q.C., for the respondents. After a patient and exhaustive hearing the magistrates decided upon reducing the rate from 1,750*l.* net to 1,275*l.* net, the Chairman remarking upon the unique and difficult nature of the inquiry, and complimenting both sides on the skillful way in which the case had been conducted. By this decision costs will follow the issue.

Growth of Newcastle-upon-Tyne.—We recently referred to the building operations at Elswick, and now we learn from the *Newcastle Daily Chronicle* that it is proposed to lay out the South Benwell estate, to the south-west of the city, for building purposes. The architect who has been entrusted with the laying out of the estate is Mr. Wm. Glover, Market-street, Newcastle. The South Benwell estate comprises about 100 acres, and it has been decided to lay out one-third of this immediately for building sites. This portion consists of about 140,000 superficial yards, and a large part of it has already been sold. It is contemplated to erect eleven new streets upon it. Nearly the whole of the front streets will be of a uniform width of 36 ft., but Clara-street will be 10 ft. wider, while Atkinson-road, which terminates the west-end portion of the estate, and Buddle-road—intended to form a main artery through the estate—will be each 50 ft. wide. The whole of the back streets will attain a uniform width of 24 ft. each. Nearly 600 houses in all will be built on the ground. Two-thirds of these will be in tenements or double flats, and the others will probably consist of self-contained dwellings.

Reredos, St. James's Church, Clapham Park.—Against the wall at the east end of the chancel of this church (which has been for the last twelve years an absolute blank) has just been placed a reredos, containing the Tables of the Law, together with the Lord's Prayer and the Apostles' Creed. It is the gift of a member of the congregation, Mrs. William Hooper, as a memorial to her husband, the late Mr. William Hooper, of Beechwood, Clapham Common. The architect is Mr. Arthur J. R. Fenning, and the work has been executed by Messrs. Jones & Willis. The reredos may be briefly described as an arcade of twelve arches, richly moulded in Caen stone, extending the whole width of the chancel, supported by delicate shafts of Derbyshire alabaster, with carved capitals, carried on a low wall of ashlar. The four panels at each side are diapered with chasing of alternate oak and vine leaves, and the idea of the oak and vine is carried out through the entire carving of crocket and finials. The four centre panels contain the inscriptions, and are grouped together with pointed gables, richly crocketed and crowned with finials.

An Opera-house Burned Down.—A telegram from Philadelphia says that at Meadville, Pennsylvania, the opera-house, with some adjoining buildings, was burnt down on Tuesday last, the loss occasioned being estimated at 250,000 *dols.*

Parkes Museum.—A lecture will be given here on Thursday next by Mr. Prigdin Teale, of Leeds, on "Economy of coal in private houses." The chair will be taken by Professor G. M. Humphry, M.D., F.R.S.

Labour and Wages in Australia.—In some trades wages have risen, and in a few others have fallen, during the last few years. The general tendency, however, is upwards, especially in the skilled branches of labour. In agricultural work, the upward tendency is more strongly perceptible. Thus the rates for married couples on stations have risen from 55*l.* to 65*l.* in 1876, to 60*l.* to 80*l.* in 1883. The wages of farm labourers have risen to 40*l.* to 52*l.*, while only in the case of country blacksmiths have wages declined, the rates for such being now 75*l.* to 80*l.* per annum. The Colony of New South Wales (according to the officials of the Government Immigration Office, Sydney) is capable of readily absorbing any amount of skilled agricultural labour, especially that of the handy kind, without affecting the current rates of wages. Agricultural labour is, in fact, in more demand than artisan labour, and good industrious hands are certain to do well in a country where the work is not harder than in England, while the food and pay are infinitely better.

Electric Lighting.—Edison's Indian and Colonial Electric Company are lighting the Parliament Houses at Sydney, New South Wales, under contract with the Government, and also the Government railway station at Albury, the junction station between Victoria and New South Wales. They are also lighting part of the General Post-office in Sydney. During the past year they have lighted the volunteer camp at Sydney; in Queensland they have a contract with the Government to light the Government House; and they are also lighting the Government printing establishment. The first mill lighted by electricity in the Australian colonies was fitted up by the Indian and Colonial Company in Queensland. In New Zealand they are also lighting the Government printing-offices at Wellington. The report with reference to the whole of these works in the various colonies has been uniformly satisfactory. In Melbourne the company has been lighting one of the Chambers of Parliament House for many months past with the greatest success.

Proposed Club and Institute for Working Men.—The directors of the Artisans', Labourers', and General Dwellings Company (Limited) passed the following resolution on December 20th, 1883, viz.:—That the Board having been informed that a feeling exists in favour of establishing a Workmen's Club and Institute on the Noel Park Estate, for the use of the workpeople, it is hereby agreed to grant the free use of a house and shop suitably fitted up for a club for twelve months, provided at least 100 of the workmen on the estate are prepared to form themselves into a Club and Institute, to be managed by a committee to be appointed by themselves."

Employers' Liability.—An action under the Employers' Liability Act was tried at Derby County Court on Tuesday, in which a labourer named Wright claimed three years' wages, at a guinea per week, of Eastwood, Swinger, & Co., ironfounders, by reason of his having lost his arm through the negligence of the defendants' foreman, in not having caused some girders which were being put up on the Midland Railway Company's works to be sufficiently secured. Ten girders, weighing 15 cwt. each, fell down, and one smashed the plaintiff's left arm. The action was defended by the Employers' Liability Assurance Association. The Judge gave judgment for the plaintiff for 16*l.* 16*s.*, the full amount.

Schools, Caverswall.—At the last meeting of the Caverswall School Board, held on the 28th ult., the Clerk (Mr. H. Marson) said that the deficiency of school accommodation in the parish had now been fully met by the enlargement of the voluntary church schools at East Vale, providing for thirty additional scholars, and by the erection of new schools at Alderley Green, which will accommodate 225 scholars. These schools have been erected by Messrs. Inskip, of Longton, from plans prepared by Mr. T. P. Hulse, architect, at a cost, including the site and fittings, of about 2,350*l.*

"An Improved Form of Silo."—In reference to the article bearing this title in our last number, we are asked to say that the invention has been patented by Mr. Potter.

Central Technical College.—We are asked to mention that Messrs. Gibbs & Canning furnished the exterior terra-cotta work in this building, illustrated in our last issue.

TENDERS.

For pair of houses, Woodville-road, New Barnet, for Messrs. Baker & Manning. Mr. Joseph White, surveyor.

Gregory	£1,189 0 0
Cox	1,140 0 0
Butcher	1,098 0 0
Batfield	1,076 12 0
Noble	1,065 0 0
Peeock	1,047 0 0
Ellwood	988 0 0

For repairs and alterations at No. 67, Atlantic-road, Brixton, for Mr. H. J. Mash. Mr. Alfred Wright architect.

Crabb & Son	£255 10 0
J. Marsland	211 0 0
Peacock Bros.	198 15 0
Smith	197 10 0

For laying out lawn tennis ground on the Cumberland Park Estate, Acton. Mr. Alfred Wright, architect.

Atkins	£293 0 0
Nowell & Robson	180 0 0
Narroway	292 0 0

For external repairs to Somers Lodge, Breading-road, Upper Tulse Hill. Mr. Alfred Wright, architect.

Bliss	£176 0 0
Trenaman & Son	185 0 0
Stapleton & Comins	180 0 0
Crabb & Son	108 10 0

For the erection of new lecture-hall on the site of St. John's Church and Parsonage, Lewisham. Mr. Joseph Clever, architect. Quantities by Mr. H. Bradley.

Hodson	£1,150 0 0
Steel Bros.	1,135 0 0
Woodward	1,089 0 0
Greenwood	1,078 0 0
Staines	1,074 0 0
Kilby & Gayford	1,069 0 0
Jennard (accepted)	1,044 0 0
Kennard (withdrawn)	986 0 0

For the erection of new schools, master's house, boundary-walls, and offices, for the Synodale School Board, at Synedale, near Pontefract, Yorks. Mr. W. Shackleton, architect, Pontefract. Quantities by the architect.

Walker, Bros., Castleford	£2,198 0 0
G. Barstow, Pontefract	2,170 0 0
Jackson, Bros., Goolse (accepted)	1,997 0 0
J. Tattersall, Wakefield	1,913 1 1
A. Spencer, York	1,857 0 0
[Architect's estimate, £2,300.]	

For the erection of a Mission Hall in Victoria-street, Cambridge. Mr. Henry G. Bishop, architect, Cambridge.

Langford	£230 0 0
Allderton	362 0 0
Parcell	359 10 0
Apthorpe	349 0 0
Pamphill	297 0 0
Pamment & Co.	289 0 0
Kerredge & Shaw (accepted)	247 0 0

For rebuilding Ship and Billet Tavern, and three shops at East Greenwich. Messrs. Williams & Son, architects.

Langridge & Son	£3,900 0 0
Marr	3,877 0 0
Staines & Son	3,692 0 0
Asley	3,399 0 0
Jackson & Todd	3,275 0 0

For the completion of sixteen villas in Bensome Manor-road, Thornton Heath. Mr. Owen Lewis, architect, 79, Mornington-road.

C. Turner	£3,996 0 0
Millward	3,320 0 0
T. Barwell	3,080 0 0
T. Norris	3,005 0 0
Cutlan	2,968 0 0

For repairs and decorations to Hanger Vale House, Ealing Common. Messrs. Glazier & Sons, surveyors, 41, Charing Cross.

Harvard Bros.	£271 0 0
Kinnmont & Sons	231 11 0
Clarke & Mannoch (accepted)	196 0 0

For alterations and additions to bank premises at Dartford, for the London and County Banking Company. Mr. W. G. Bartlett, architect, New Broad-street. Quantities by Messrs. Stonor & Son.

J. G. Naylor & Son (accepted)	£2,937 0 0
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For sundry works at No. 2, Carlton Hill, St. John's Wood. Mr. Robert Willey, 66, Ludgate-hill, architect.

Hayward & Son	£180 0 0
W. Beasley	139 0 0
J. Myring, St. John's Wood	132 0 0

For engineering works at the Poor of Paddington, Messrs. A. & C. Harston, architects, 15, Leadenhall-street.

Contract No. 1.—Laundry Machinery and Fittings, Steam Boilers, Engines, Hydraulic Lifts, &c.	
W. J. Fraser & Co.	£3,384 0 0
Bradford & Co.	3,331 0 0
Clements, Jeakes, & Co.	3,269 7 0
Benham & Son, Wigmore-street	3,160 0 0
* Accepted.	

Contract No. 2.—Kitchen and Scullery Fittings. Clements, Jeakes, & Co.

Clements, Jeakes, & Co.	£632 0 0
Benham & Son	590 0 0
Bradford & Co.	586 0 0
W. J. Fraser & Co., 89, Commercial-road (accepted)	535 0 0

Contract No. 3.—Tanks, Mains, Hydrants, Sanitary Fittings, Warnings, &c.

Clements, Jeakes, & Co.	£3,785 17 6
Clark, Bennett, & Co.	3,487 0 0
Rosser & Russell	3,123 0 0
Stidder & Co., Southwark Bridge-road (accepted)	2,750 0 0

SPECIAL NOTICE.—Correspondents are desired to send full lists of persons tendering, with the amount of each tender. In future, no single name will be given without the amount of the tender, and not then unless we have the assurance of the sender that there was no competition.

TO CORRESPONDENTS.

Clerks cannot advise without knowledge of circumstances, which could only be gained on the spot.—H. H. (thanks)—W. S. (see below)—K. and H. (cannot approve such a scheme)—K. & Sons.—W. G. (next week).

Correspondents should address the Editor, and not the Publisher, except in cases of demand.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

We cannot undertake to return rejected communications. Letters or communications (they are more news, items which have been published for other journals, are NOT DESIRED.

THE INDEX and TITLE PAGE for Volume XIV. July to Decem. 1883 are given as a Supplement with this number.

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The Builder.

VOL. XLVI. No. 1297

SATURDAY, JANUARY 10, 1884

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Murray's "History of Greek Sculpture"

IN the second and concluding volume of Mr. Murray's admirable work on Greek sculpture* we are on somewhat firmer footing in regard to the historical view and treatment of the subject. We have great names, of whom and of whose works we, at least, know something; we have a certain number of signed productions, and of others the authorship of which has been shown with a probability approaching to proof, whereas in the earlier volume the ground was, as we observed at the time, so debatable that the title might better have been put in a modified form as "A Conjectural History of Greek Sculpture." Even here, however, as Mr. Murray confesses in his preface, the charm of artistic personality, which has often given such interest to the pages of a historian, is wanting. Greek sculpture "presents no lives" to beguile the student along an arduous path. "Only here and there an incident, handed down on mostly a dubious authority, breaks the narrative of work done and the examination of what remains of it to our day." There is this great added interest, however, as we get later in the progress of Greek art, that we find ourselves face to face with works of the highest order in themselves, not with archaic and partially tentative effects. Thus, if the historical interest is doubtful and sometimes illusory, the artistic interest of the portion of the subject treated in the volume before us is paramount, and, it may be said, undying. It commences with the Parthenon sculptures, includes those of the Erechtheion and the Temple of Victory, and the names of Praxiteles and Scopas, and concludes with a brief glance at the school of imitative Greek sculpture of the Roman period; the author declining, however, to follow out this part of his history to the decay of the art, as needlessly prolonging the study of a phase of

the subject which can only be unsatisfactory and somewhat melancholy.

To an author inviting us to look once more in a critical spirit at those masterpieces of sculpture the representations or reproductions of which have filled the civilised world, and have become almost as familiar to our eyes as the moving forms of modern life, we are naturally disposed to turn with the question, what new light has he thrown on these works, their style, their meaning, the nature of their artistic powers, which can be valuable to us as suggesting the road to a better and more complete comprehension of them. Mr. Murray suggests at the outset a re-consideration of a question which has been very differently viewed in reference to Greek sculpture; the element of idealism in it. We do not think the author very clear in the expression of his meaning; but it must be remembered that it is a subject in which verbal definition is very difficult, even to some extent impossible. Mr. Murray puts it that a painter sketching a landscape before him has presumably been struck and captivated by some beauty in it, but that he could not have been so captivated unless the landscape had answered to an ideal possibility before shadowed forth in his own mind. The real landscape assists him to frame his ideal in a less vague form, but he does not treat it realistically in copying it; to do that would be to make it co-equal with the image or idea which it is meant to serve and assist. This is a very heretical view in reference to a great deal of the artistic practice and criticism of the present day, but the latter part of the remark is a very good way of putting the relation of nature to art. We may somewhat question the position that the artist must have a vague ideal of that special landscape in his own mind to have derived pleasure from it; we should rather say that he must have the idea of certain qualities of landscape, derived from observation, no doubt, or he would not understand the special landscape. But the observation that the too realistic reproduction of what he sees with the outer eye is a defeating of what would otherwise be the true value of the landscape in furnishing food for ideal art, is very true and very well put, though very likely "Greek" to general readers. The application of this to sculpture is obvious enough. The artist of an early period has in his mind an ideal figure of a man, of a certain ideal character, which yet he could never have had but for the prompting of the appearance and character of the real men around him; he uses the imitation of them as the help towards embodying his ideal. But the mechanical difficulties of adequate imitation beset him very hard, and lead to many efforts towards an

idealisation of skill and execution, and the results of these enter into the minds of later artists as ideal factors, instead of simple nature herself. Thus we have the foundation of a school in which a certain method of treatment is adopted, not derived directly from nature; or we have, before the art has reached its highest stage (or even after that), a special ideal accepted and repeated, with continual reference to nature for verification and correction. In this way, observes the author, a comparison of the early Greek vases will show with what constancy the main elements of composition were adhered to and repeated, "as if they were artistic formulae established for all time."

Thus the idealisation of skill plays an important part in Greek art, which is simple in its originating motives, though highly refined in execution, and this executive influence operated through the character of the material also. A great deal of the Greek idealisations of human form, it is suggested, may have arisen, not so much from any deep-seated theory as to what the form and character of anthropomorphic deities ought to be, as from the semi-practical result of working so much in bronze and marble. This we believe to be quite true; and this conventionalised marble style of the Greeks has influenced sculpture down to our own day. Recently a rebellion has been made against it by a good many sculptors in France and Italy; but the results have tended to prove that for such a material as marble the Greek style was the right one,—we might even say, the natural one. The real successes in sculpture of a more naturalistic and detailed character, such as those of Dalou and some other French sculptors, have been achieved in terra-cotta; a fact in itself bearing out the view as to the influence of material upon the form taken by the art.

Thus we may take it that the gods and goddesses, greater and lesser, of the Parthenon tympana were not the result of a conscious endeavour to idealise human forms into what might be considered adequate representations of deities. They were representations of deities in the guise of the noblest and most healthful human forms, conventionalised into a broad and monumental style, in which some of the minor realistic details of the living human figure were merged in a broader and more massive,—as we should now say, more sculptural,—treatment, arising mainly out of the conditions imposed by the material, and partly also from the situation in which the work was to be placed, rather far from the eye and in close connexion with the severe lines of Greek architecture. That there was no intention of avoiding realism, except so far as the condition of place and material rendered it desirable or natural to do so, may be in-

* A History of Greek Sculpture under Pheidias and his Successors. By A. S. Murray, of the Department of Greek and Roman Antiquities, British Museum, Vol. II. With Illustrations. London: John Murray, 1883.

sferred from that one little fact of the creasing of the skin of the armpit of the Neptune fragment, which delighted Haydon so much.

These figures, then, appear to have been intended by Phedias* and his colleagues as the noblest representations of the human figure which they could produce in architectural sculpture, although nominally accepted as representing (probably very inadequately in the idea of Phedias) superhuman beings. The popular idea that there is a very imaginative and ideal aim in the sculptures of the Periclean period have long believed to be a misapprehension. There is, in fact, in Greek art an exceedingly practical element, not forced forward too much, but never out of sight. The desire to create ideals of gods and goddesses, if it floated through the mind of the artist, was subordinate to the more practical idea of making a fine series of figures, and planting them effectively in their architectural framework. The now incontrovertible fact, which so long shocked the minds of students of Greek art, that Phedias made his great works in ivory and gold finishing, is almost conclusive against the notion that the Greeks were especially possessed of idealising aims in their statues. Monumental expressiveness in the external sculpture, rich decorative effect in the internal, were their most direct aims. There was nothing whatever in the Greek artistic mind analogous to that deep thoughtfulness which underlies the mere outward delineation in the works of Michelangelo and, when at his highest, of Raffiello.

To go more into detail; the most interesting portion of Mr. Murray's remarks on the Parthenon sculpture is in reference to the frieze. This has for some time past been regarded by most men who "can render a reason" as being probably a representation, very nearly realistic, of the actual procession of the Panathenæan festival, merely conventionalised so far as the conditions of architectural sculpture demanded. Mr. Murray thinks that it was not a representation of an actual fact of the day so much as a repetition of a more archaic treatment of the same subject which had decorated the previous temple, the Heortompeios. The reasons for this opinion, which are of some interest, are thus given:

By assuming the various elements of the procession on the Parthenon frieze to have been enlarged and enriched from the older temple to suit the greatly increased dimensions, there is to be gained, that its infinite variety and splendour of movement, which now seems overpowering and out of comparison with the reality of an ordinary festival procession, may be explained as the result of a wealth of artistic invention lavished on a subject which had become familiar on the Acropolis as a sculptured representation. Otherwise it must be judged as an idealisation from a common reality, and that this is no easy task, the innumerable efforts to interpret it abundantly prove. In the age of Pericles the Panathenæan procession was, doubtless, an occasion of public pride and agitation. Yet it seems to us now impossible to imagine that, with every allowance of this kind, it could then have been made to form, for the first time, the basis of so elaborate a conception. To Peisistratos, on the other hand, belonged the glory of establishing the greater Panathenæan games, and for his immediate descendants to have perpetuated this event by representing it on the temple of Athena was natural enough. That temple, to all appearance, owed its existence to them. The Panathenæan procession, treated with the simplicity of the archaic bas-relief of which we have been speaking, and extending along the comparatively small dimensions of the Heortompeios, would be clear and intelligible as a single idealisation of a well-known scene in Athens. On the Parthenon frieze it is still an idealisation of that scene; but the artist has united in it an ideal drawn from actual observation along with an ideal founded either on a previous rendering of the subject, or on previous renderings of similar subjects. Of these alternatives the former appears to be the more con-

sistent with the circumstances of the case. It illustrates the force of artistic tradition, and it explains the power of public sentiment in retaining on the principal temple a scene which, from its nature, belonged to the representations of an age of art which had passed away. Its creation in the time of Pericles is incomprehensible. Its splendid elaboration then, from the simple product of an earlier period, conforms to what is known of the sculpture of that time; and that this single product had existed on the older temple which the Parthenon was built to replace is, at all events, a strong probability."

This is the only reasonable reason we have seen given for what must strike every thoughtful student of the Parthenon marbles, viz., the great *naïveté* of character and feeling in the frieze, as compared with the rest of the work, the pediment sculpture and the best of the metopes. They by no means give the impression of belonging to the same age and the same building. Mr. Murray, we observe, does not regard it as proven that the frieze represents the Panathenæan procession, but accepts it as the most probable theory. Into the meaning and composition of the frieze he has gone with great care, and this is one of the most interesting portions of the book. He regards the north and south friezes as representations of the same procession, as if seen from two sides of the street. As he says, the observer, a Greek of the time of Pericles, familiar with works of archaic art, in which desire to have both sides of a thing represented had led to fixed conventionalisms in composition, would have found no difficulty in annihilating in imagination the whole breadth of the Parthenon, which separated these two friezes, and combining them in his mind after seeing both separately. The west frieze is occupied with the starting of the procession, though Mr. Murray admits the body does not file away evenly north and south, but that the large majority of the horsemen move off to the north side. Into the details of explanation we cannot go here; but the two sides of the procession, he considers, progress eastward along the two flanks, and at the east end is the circle of seated deities, who are the objects of the procession. The suggested explanation of the seated group, who are sideways and back to back, the seated figure on the throne in the centre being also seen sideways (so that there is no real centre of the group), is certainly very ingenious and worth consideration. It is that the gods are really intended to have been seated in a semicircle, facing the head of the procession as it approaches; but that the group is on what might be called a sort of "Mercator's projection," drawn out in the flat, and shown in profile, for more convenient representation in low relief, and perhaps to fill the space of the frieze better. Mr. Murray gives a perspective representation of the arrangement which the frieze, he considers, was meant conventionally to convey to the eye. In all this there is a good deal that is very probable; and we may add that there is a historic interest in this view which the author does not touch upon. If the frieze were, as he suggests, a repetition in more elaborate form of an archaic frieze representing the same subject, this representation in profile of what is not intended to be thought of as in profile, may have been a remnant of the archaic treatment of the older frieze, preserved for the sake of association; and it reminds one curiously, too, of the connexion of Greek with Egyptian art, and of the profile figures of the Egyptians. Whether the seated figures referred to are deities is another question. Mr. Murray says it is the generally accepted opinion that they are. On their own merits they do not give us that idea, and one of Mr. Murray's reasons for it, that, though seated, their heads are on a level with those of the persons standing, goes for little or nothing, because throughout the whole frieze a conventional adaptation of heights is kept up in this way, the riders' heads coming little above the heads of the pedestrians; the whole arrangement being obviously made to harmonise the main line of the sculptural composition with the horizontal lines of the building.

The metope sculptures are the object of some interesting criticisms; it is pointed out that they show a different proportion of limbs

from the frieze figures, and Mr. Murray thinks "a manifest desire to elevate the subject, and render it worthy of the building." This may be said of two or three of the metopes, the merit of which we have always thought very unequal, and we quite agree in the idea that they are not all the work of the same artist, though we do not know if we should accept necessarily Mr. Murray's distinction between those in which the forms of man and centaur are blankly opposed, and those in which drapery is introduced to connect them.

The interest of the Parthenon sculptures and the suggestions concerning them has occupied us too long to do more than glance at one or two other points in Mr. Murray's work. The progress of Greek sculpture style, from the grand monumental manner of Phedias, through the more delicate and somewhat more realistic yet refined manners of Proxiteles, to the comparatively coarse and prosaic Greco-Roman manner, is well brought out in the further chapters, from those on the Parthenon up to the close. The graceful statue of Apollo Sauroktonos might be, as Mr. Murray observes, a *genre* work rather than a representation of an ideal figure. The so-called "Fighting Gladiator," which is now said to be a running figure, though we should never call the action of the feet "running," exhibits the vulgarity of mere successful representation of an athletic man of no very high type; probably, however, no work of antique art has been more drawn, sketched, and reproduced in all kinds of ways; it is a favourite student's exercise, probably on account of the various practice in foreshortening which, from the attitude, the limbs afford in various points of view. Rayet assigns the work to date B.C. 170 at the earliest. Mr. Murray observes, "like the Laocœon, it is on the one hand a display of muscular form under the severest tension, and on the other an example of creative force originating in technical knowledge of muscular form, and only extending beyond this knowledge to the small degrees of some slight observation of Nature herself. The type of head is derived from Lysippos. At a greater distance this is true also of the whole form, and yet it is manifest that there is something in the statue that constitutes a break with the older traditions of Greek sculpture, and allies it rather with the later Greco-Roman movement. The Laocœon produces the same impression. In both the idea is carried out with complete technical skill, and with singular force. But it is an idea generated out of this skill, to which indeed it is a slave." We can hardly agree in placing the Laocœon no higher than this; it is at all events a work much superior in expression and feeling to the "Runner"; dealing also with a more elaborate task in technique.

The volume is very fully and well illustrated, sufficiently so to bring out afresh to our conviction the unimpeachable superiority of the Phediasian sculpture to all work, even Greek, which preceded or followed it. In the tympanum sculptures of the Parthenon, which are, of course, the "roof and crown of things" in sculpture, this superiority, rather perhaps to be felt than defined, is so marked as to render almost everything else amongst the illustrations comparatively commonplace by the side of them. If we were to try to define in what this superiority consists, it would seem to be summed up in the precise balance of all the qualities of which sculptural design is capable; truth to all the leading facts and characteristics of nature, without vulgar realism; nobility of form and repose of expression and grouping, not degenerating into stiffness or conventionalism; brilliant and effective treatment of drapery, without obscuring the build of the figure; indeed, helping to express it. This complete observance of balance, and the instinctive recognition of the capabilities of the material, and of the degree to which detail should be worked out in relation to the architectural portion of the structure, result in productions which represent the perfection of style, which almost means the same thing as balance. Works, however, at best left to express what one feels as to the commanding quality of these greatest works of the art of the Greek sculptor, who a

* Mr. Murray's pages do not tend to decrease the confusion as to English writing of Greek names. The spelling "Phedias" is, however, now becoming so much adopted by literary men and artists that it seems undesirable further to stand out against it, as the long-accepted habit of representing the "ei" in the first syllable and the "ee" in the second by the same English letter was certainly not defensible to begin with. But we see no reason for writing, as Mr. Murray does, "Skopas" and "Perikles," but the admitted correlative of the Greek *κ*. And, if Mr. Murray is so particular on that point, why not write "Brechtum"? If we write "Parthenon" certainly in common sense we should also write "Sauruktonos."

called into play, in our author's concluding words, "many of the best qualities with which men are endowed," so much so, that in the Parthenon marbles we seem to feel almost a moral as well as an artistic greatness; something in the presence of which all littlenesses and tricks, either of art or manner, seem rebuked as by a superior influence.

THE LAWS CONCERNING PUBLIC HEALTH.

THE obscurity which hangs over much of the early history of our country is due to the paucity of contemporary records, to the astounding credulity of the annalists, and their habit of receiving the materials of their accounts at second-hand and from prejudiced sources without question. As a consequence we are compelled to get at an approximation to the truth of events which happened long ago as best we may, by analogy, by inference, and in a measure by conjecture.

It would appear as probable that our posterity will be similarly perplexed from an entirely opposite cause, and that the very abundance of their available information concerning us will prevent their arriving at any clear conclusion as to our condition and our doings.

The [Macaulay of the future who shall endeavour to realise the circumstances surrounding the lives of the bulk of the people in the latter years of the reign of Queen Victoria will take down from the shelves of the British Museum amongst other volumes the one now lying before us,* a handsome quarto of 800 pages, comprising a mass of legislation, having for its object the social and physical well-being of the community. Some idea of its scope and comprehensiveness may be formed from the fact that the mere enumeration of the Acts of Parliament bearing upon the public health, passed within the last few years, and their leading clauses, extend to forty-eight closely-printed pages.

From a perusal of the contents of the book he will find that careful provision has been made for the health of man, woman, and child, under every conceivable condition of life.

The preservation of infant life, his defence against improper nursing, against preventable disease, his education, the regulation of his hours of labour, and the apportionment of the quality and quantity of that labour to his age and capabilities, are all prescribed. In mature life, the citizen is the subject of equal care, and is guarded so far as practicable against harm from his own acts as well as from those of his fellow-men. He is provided with healthy dwellings, properly built, drained, and ventilated. Pure water is furnished for his drink, and he is secured against unwholesome food, in almost all forms by an elaborate series of legislative precautions. Noxious and offensive occupations are removed to a safe distance from his dwelling. Public hospitals and special sanitary arrangements in times of epidemic offer the poorest in the land such skilful treatment, as can only be otherwise commanded by the very rich. The close of an unsuccessful struggle with the world is rendered less bitter by the organised charity of the State, and at his death the last offices are conducted decently and reverently at the public charge. Everything that the most anxious care and the employment of the highest skill can attain for the amelioration of human life is done, and the Acts which embody the noble endeavour will remain to all future a monument of the humanity of the age, and a triumph of Christian as compared with the older Pagan ethics. Our imaginary inquirer would conclude, and he would be justified in concluding, that in the year of grace 1883 the English nation were well housed, well fed, well educated, healthy, and happy; that their cities were models of sanitary perfection; that abject poverty and avoidable sickness were, if not altogether banished from our midst, at any rate an exception and an anomaly.

And then, in the prosecution of his researches, he would come upon a file of old newspapers, bearing even date with the volume from which he had extracted this comfortable assurance, and he would read with dismay the revelations of those philanthropists who make it their business to trace the very poor to their squalid hiding-places, the noisome recesses of the mis-called "homes" of "Horrible London." We can partly realise the shock such a discovery would produce. He would read of a condition of things the precise opposite of the picture which had arisen in his mind on a perusal of the book adverted to. Of wholesale destruction of infant life, of education systematically neglected and the means provided for it evaded, of brutal ignorance and crime in place of the light of Christian knowledge, of poisonous exhalations surrounding the dwelling in place of pure air, of diluted sewage for drink instead of pure water, of filthy dens in place of wholesome houses, and in all things, the evils of which the mitigation or removal was pre-supposed by the Acts of the governing powers. Such a surprised reader would scarcely believe his own eyes. He would discredit the record until he found it corroborated by contemporary witnesses, and deducting, as we have been obliged to deduct, something for the involuntary exaggeration of a zealot, and something for the exigencies of a style which is addressed rather to the feelings of the public than to their judgment, he would be obliged, as we have been obliged, to conclude that in spite of all that had been done, and the greater things which had been attempted on behalf of the public in general, and the poor in particular, the picture presented and borne out by incontestable facts is indeed a sickening one. If the historian of our age carried his inquiry into the cause of this contrast between the aims of the Legislature and the facts of our time he would find that the weak point was in the provision of inadequate machinery for carrying out the regulations enjoined by Parliament. The author of the book before us abstains from any criticism of the Acts in question, reserving a discussion of their wisdom and practical efficacy to a future occasion. It is, no doubt, true that here and there they are defective, and here and there inconsistent. But we are not inclined to dwell upon shortcomings inseparable from all human work. The intention is everywhere admirable, and, for the most part, it cannot be denied but that the Acts have been framed upon the best advice and with competent skill. There are a few slips, and there are provisions of doubtful prudence, and there are gaps in the scheme to be filled up by subsequent enactments. But the main want is the provision of a more efficacious executive. The first requisite to this end is the education and appointment of an increased number of competent inspectors and surveyors, and this can only be accomplished by the inducement of proper emoluments. Certainly one of the most important of all the functionaries charged with the execution of the Public Health Acts is the inspector of nuisances, and the generally inadequate nature of his remuneration amounts to a positive injustice. The surveyors who are charged with the supervision of new works and buildings are often overworked if they are not always under-paid, and their hands are always more or less tied. And the natural result follows. It is forbidden to build upon a foundation of decaying vegetable refuse, and dwelling-houses are so founded every day. It is enjoined that all new houses shall be built with sound and suitable materials, and mortar composed of lime and clean sharp sand; and they are, as a fact, built of bad, soft materials and garden mould. A by-law, in one instance, prescribes that the whole site shall be covered with asphalt on 6 in. of cement concrete, and the site is commonly guiltless of either. It is quite an exception if an ordinary damp-course is provided. It is obvious that the machinery for putting in force the existing enactments is unequal to the occasion, and that what is required is not a further elaboration of the legislative scheme, which is sufficiently full and excellent as it stands for most practical purposes, but some reorganisation and much extension of the executive. London

is not alone in this deficiency. Liverpool and Manchester, Edinburgh and Glasgow, and other large towns, in varying degrees suffer from the same cause, although some approach very near perfection in their sanitary arrangements. One of the first measures which should engage the attention of the authorities should be the rearrangement of the areas for which the district and borough surveyors are responsible, and a proportionate increase of the staff, and the placing of all under one central authority. There may be questions as to the prudence of payment by fees, and the propriety of allowing such officials to conduct a private practice in addition to their public functions; but there can be no question as to the necessity of re-arranging the limits of their several districts. There are districts in the older and more settled portions of the metropolis where the fees from some casual alteration of old buildings and an occasional rebuilding scarcely defray the office expenses of the surveyor; and there are other districts where the immense activity of the speculating builder yields the surveyor a large income by crowds of buildings rising with a rapidity which defies, under the existing system, such a scrutiny as will ensure their being constructed in accordance with the regulations.

The author of the valuable collection of Acts to which we have adverted says very wisely that "compulsory sanitary legislation is never agreeable when it outruns the convictions of the public, and that their education in the principles of health is the first thing to be attended to." We are inclined to think that the public are now, for the most part, alive to the importance of the application of sanitary science to their dwellings and occupations, although amidst a multitude of professors of conflicting theories they are sometimes puzzled whom to follow. But the execution of the recommendations of the Government is now left to ignorant and careless builders, and the approval, more or less perfunctory, of surveyors not numerous enough for the work and not sufficiently rewarded for their pains to enlist their best exertions. Thanks to the various sanitary commissions and the independent labours of architects and engineers, the leading principles of sanitary science are well understood and they are fortunately of easy application. The law says they shall be observed. The only thing now wanting is a sufficient executive properly educated for its duties to enforce the law. Such a body must, sooner or later, be established, unless the mass of legislation on the subject is to become a dead letter, and its members must have at hand some such a compilation as that which the industry of the author of the book which has occasioned these remarks has supplied. We commend it to all who are interested in this important subject, and we shall welcome its promised companion volume; and, meanwhile, we may have something to say on the necessary reform of the machinery for enforcing the enactments of the Legislature.

MR. ALFRED HUNT'S LANDSCAPES

AFTER admiring for years the examples of Mr. Hunt's genius as a landscape-painter, as they appeared from time to time in the exhibitions of the Society of Painters in Water-colours, and more rarely on the walls of the Royal Academy's rooms, it was not till last Saturday afternoon that we actually realised what a great landscape-painter he is. It needed but the first glance at the collection of oil-paintings in the larger room at the Society of Fine Arts Gallery to carry immediate conviction of what we have long believed to be the case, that work so fine and poetic as his has had no chance of being done justice to, either in regard to conception or result, on the walls of Academy exhibitions crowded with paintings in a louder and coarser key. This is the rather to be observed because some of the writers who act as "critics" have attempted to throw cold water on Mr. Hunt's oil-painting, and to assert or insinuate that in taking it up he had quitted the field of his best powers, which had been shown to the highest

* The Laws concerning Public Health. By William Robt. Smith, M.D., assisted by Henry Smith, M.B. Sampson Low & Co. London, 1883.

advantage in water-colours. The collection of rather more than thirty paintings in oil, at present in the Gallery in Bond-street, ought to dispel this kind of nonsense once and for ever. It was difficult, except for those who would study pictures more carefully than most visitors to the Academy exhibitions do, to appreciate all the varied delicacy and truthfulness of such works as "Sonning" and "A North-country Stream," amid the glare and crowd of the annual picture show. They are works far too refined and thoughtful for such an atmosphere, though neither of them displays Mr. Hunt's highest powers. But, when placed where they can be studied quietly and without such detracting influences, their truthfulness of effect and insight into nature must be recognised without fear of contradiction from any but the groundlings. These qualities, however, beautiful as they are, become comparatively secondary when we turn to some of the works which are more distinctly poetic in conception and meaning. The "North-country Stream," which formed a gem amid last year's Academy collection, represents an every-day landscape effect in a beautiful nook of river scenery, but with no special appeal to our sense of the solemn and pathetic in the expression of the face of nature. Every square inch of canvas, certainly, is a study; we can look into the recesses of the paths under the masses of summer foliage, and imagine we could penetrate into the scene. As in the "Sonning," there is a perfectly real effect without the least hard or over-wrought realism. But there is a far deeper feeling in others of the works here, which are not less remarkable for their intensity than for their variety. It is no mere collection of landscape studies in one easily recognisable manner; the feeling, the treatment, the effect, is as diverse as in Nature herself, as it can only be when a painter is aiming at representing the feeling of Nature herself, instead of translating Nature into his own manner. This is the remarkable contrast between Mr. Hunt, who works in the spirit of Turner, and such a school of landscape as that of the eminent French painters who developed the school started by Constable. The latter are, or have been, some of them, very powerful painters, but each has his own peculiar effect, and is known by it. A Corot is a Corot, a Dupré is a Dupré; but a Hunt is a scene in nature, and the paintings in this small collection are so various in tone and feeling that it would be easy to represent it as a collection of works by various gifted landscape-painters. To take only two or three; there is the grim, barren scene "On the Coast of Yorkshire" (110), originally exhibited under the title, "An Iron-bound Coast," a desolate shore under rugged cliffs, with the wrath of surf just seen in the distance; there is the rich, golden "Whitby Evening," a glorious sunset effect; there is "The Mountain joyous with Leaves and Streams," a bright and glittering landscape in full sunshine; there is the solemn and pathetic "Time and Tide" (how suggestive is the title), where we look, at the coming on of twilight, over a cold, leaden sea, the waste aspect of which is intensified by contrast with the strip of warm, mellow light on the wet sand reflecting the last "yellow-rifted gleam" of sunset. Each of these pictures is a distinct poem in itself, an interpretation of one of the manifold voices of nature. The last-named, it is interesting to observe, is an early one (1857), contemporary with others which are less mature in style and less intensified in feeling; it stands almost alone among the works of the same date.

Among the more numerous water-colour works we are glad to meet again many old friends, and to recognise as fully as in the oil-paintings the presence of a variety of effect derived from pure study of nature, and marred by no trick or mannerism. The prevalence of an inclination, at peculiar periods, towards one class of effect rather than another, is all that can be noted, and this only in a minority of examples. "Tynemouth Pier" (55) is the best example we have seen of Mr. Hunt as a painter of stormy sea, a subject which he has not handled very often. Near it hangs Mr.

Caine's "The Rainbow" (58), a remarkable example of what may really be called the painting of light; it is seldom indeed that any painter succeeds in making mere paper and pigments produce such an apparent dazzle to the eye as this,—the work of close study and observation, without the slightest attempt at forcing an effect by artificial contrasts.

It is in this individuality in the treatment of each scene that Mr. Hunt, among contemporary landscape-painters, stands almost, if not entirely, alone, with the exception of Mr. Albert Goodwin, who, charming as his art is, must be regarded as a painter of a lesser, slighter, and more fanciful genius. We can name no one else of whom it can be said that you cannot at once identify his works, at a little distance, by the special tone and manner which he carries with him, as his sign-manual, into everything he paints; even limiting his choice of scenes to one special character, one time of day, one particular atmospheric effect. In this respect Mr. Hunt is almost as various and truthful as Turner, though he has not the massive force and breadth of Turner. The qualities which, apart from this, seem to us most to characterise his works are a remarkable power of painting light, so to speak, and of observing and reproducing most delicate gradations of tone and colour in the various distances and lights of his scenes; a very strong feeling for the changeful and evanescent expression which makes so much of the poetry of landscape, and is sometimes wonderfully reproduced in his painting (see, for instance, "Summer Days"), so that we seem to see the lights and colours shift and glimmer on the canvas; and a faculty for giving realistic truth of effect without losing atmosphere. To this latter point, we feel sure, much study has gone in many of these works; we may instance the water-colour of "Durham" (24), where the architectural character of the bridge, the houses half-way up the hill, and the cathedral, is so truthfully conveyed without at all degenerating into mere painting of buildings; they are buildings, but they all fall into their place as part of the poetry of the whole scene. One or two early oil paintings, which have been added since the private view day, the "Haunted Stream" and "Borrowdale," are interesting, as showing Mr. Hunt before his emancipation into a style of his own. The latter is exceedingly like a Turner or a copy of a Turner, and the artist might, had he pursued this path, have been only an echo of Turner; but he has done better, and followed out the principles of Turner in his own special method.

Before concluding, there is one point in connexion with the exhibition on which we desire to make an obituary note; the habit, which is growing into a positive nuisance, of thrusting into a catalogue on such an occasion the disquisitions on the paintings of this or that literary commentator (we will not say "critic"). Why cannot we be allowed to enjoy the genius of A. W. Hunt without the lucubrations of E. W. Gosse? The case becomes worse when the commentator appears totally unable to appreciate the finest part of the work of the unfortunate artist upon whom he is let loose. Every person competent to feel and understand the subject knows that the remarkable point in the exhibition is the collection of Mr. Hunt's oil paintings, and that the effect of it will, probably, be to place him in quite a different position as a painter in oil from what he has been popularly supposed to hold, and to render it impossible for the Academy any longer to treat him with the disrespect they have hitherto shown to much of his work; but the catalogue passes over this section of his work without even faint praise, leaving it to be inferred that he had comparatively failed. Mr. Gosse is known as an accomplished man of letters and a rather mediocre poet; but what are his claims to sit in judgment on the work of the greatest landscape-painter of the day? And what is the common-sense of holding an exhibition to do honour to such a painter, and, at the same time, allowing a literary operator to whitewash away (as we heard it expressed) the genius of the artist? We hope we shall have "no more o' this."

NOTES.

THE weekly reports and letters on the state of the dwellings of the poor seem likely to swell into a separate department of tragic and perplexing literature. Elsewhere we notice the views propounded by a writer in the *Quarterly Review*, but the mass of matter in the newspapers on the subject it is difficult to analyse into any definite result. The reports from different persons and different districts are very contradictory as to many of the points that are in question in regard to the method of dealing with the subject, though there is a melancholy unanimity as to the nature of the present facts. A further report of the Brompton Committee confirms, in one instance at least, what has been said and contradicted in regard to the manner in which sanitary officers are hampered by circumstances in carrying out their duties. Dr. Rendle, it appears, who was formerly Medical Officer of Health for Southwark, resigned his position "in disgust," and has since been elected to a seat in the local vestry by the ratepayers who appreciated his good intentions. A long report in the *Newcastle Chronicle* a few days ago gave a detailed account of the inspection of the slums of Newcastle by the Recorder, with a string of hideous facts, including some things which cannot be dealt with directly by existing law; windows in which there was scarcely a whole pane of glass left, rooms in a state of hopeless discomfort from dilapidation, &c.; while the "common lodging-houses" were mostly in comparatively reputable condition. This is a significant contrast, inasmuch as these come much more directly under the operation of the law than ordinary tenements. Miss Octavia Hill announces that she has volunteers for the charge of houses under her system, and hopes to have more. The system of personal supervision of both tenement and tenement is the most effective as far as it goes,—but how far can it go?

A CORRESPONDENCE in the *Temps* of a few days back, between M. Garnier and M. Antonin Proust, one of the members of the committee for arranging the competition for the Gambetta statue, draws attention to a point of some importance in regard to competitions of this nature. The distinguished French architect objects that the proposed monument includes both sculptural and architectural elements, and that these ought to be considered separately. Otherwise, there may be very good sculpture with a very bad architectural composition, or the reverse, and then how is it to be decided? If the judges are mostly sculptors, thinks M. Garnier, they will go for the best sculpture; if architects, for the best architecture: and either way something unsatisfactory will result. There ought, he thinks, to be two competitions, one for the general composition and disposition of his monument, the second for the sculptural figures in detail. M. Proust, in reply, thinks that as the committee addressed itself to French artists without distinction, there will probably be a collaboration of architects and sculptors in the first instance; and as to the committee, they have taken steps to secure equilibrium in the component elements of the jury. There is something in M. Garnier's criticism, however, though the adoption of his plan might lead to some delay and be rather difficult to work practically. The noticeable point to English readers, of course, is that M. Garnier, an architect, remonstrated with an official body on a subject within the range of his special training, and received a polite and respectful answer. We have got quite beyond that in England.

A CLEAR and impartial report on the railway and other plans affecting the Holborn District has been addressed to the local Board of Works by their Surveyor, Mr. Lewis H. Isaacs, F.R.I.B.A. The schemes reported on are four in number. Of these the first is the project of the Metropolitan Board of Works for widening Elm-street, as to the value of which Mr. Isaacs is of opinion that there can be no doubt, provided that it is not allowed to inter-

tere with the formation of a street from the point of intersection of Gray's Inn and Clerkenwell roads to the Angel at Islington. This last is an improvement which has long pressed for execution, the present route *via* "Mount Pleasant" being positively dangerous. As to the second scheme, that of a tramway down Farringdon-road, it is pointed out that it would run closely parallel with the Metropolitan Railway, with which it cannot compete either in speed or in price, and that it would be injurious to a large and important frontage, the built portion of which is already of the value of 14,000*l.* a year. The remaining schemes are those of the London Central Electric Railway Company, for a line from Northumberland-avenue, by Piccadilly-circus, to the General Post Office, and of the promoters of the Mid-London Electric Railway for a line from the Marble Arch to Cornhill. The first of these is designed to come so near the surface of the ground as to involve much interference with the roads, sewers, and gas and water mains. The second, laid out at a depth of from 60 ft. to 75 ft. below the surface, would avoid two inconveniences, but would be difficult of access for the passengers. Apart from these objections, and from that of the annoyance caused during the process of construction, Mr. Isaacs holds that these two lines would each supply a great want now felt by London.

The inquest on the Coppull-lane Bridge accident, as will be seen from the report elsewhere, has resulted in a verdict of "Accidental death," a verdict which has been in several cases, as apparently in this, the refuge of a jury not fully understanding the case, and anxious not to bear hard upon any one. On the basis of reports which may not be entirely accurate or sufficiently full to give the whole bearings of the case, we should hesitate to express too decided an opinion, but we must say that the verdict is hardly in accordance with the conclusion most people would arrive at from the evidence of Mr. Worthington, the engineer for that portion of the London and North-Western railway. He distinctly stated that the bridge inspector had ordered the cutting of the voussoirs too soon; that this should not have been done until they were prepared to let the work down; and that there was no occasion for hurry. He spoke highly, it is true, of the experience and judgment of the bridge inspector generally, and also stated that the mortar appeared not to have been very sound; but he distinctly averred that the accident need not have happened but for the precipitate manner in which the work was commenced. Under these circumstances it hardly appears that a verdict of "accidental death," without comment of any kind, quite represents the nature of the case.

From a report in a Liverpool paper it appears that at a meeting of the Liverpool and District Association of Science and Art Teachers, held in that city on Saturday last, a paper was read by the Hon. Secretary, Mr. W. Hewitt, on Prizes and Scholarships, condemning the action of the Science and Art Department in determining to withhold prizes from elementary works and to substitute a few scholarships, tenable at South Kensington School and the Royal College of Science, Dublin. As far as the Art Department is concerned, we are entirely against the views of Mr. Hewitt, and are glad to hear the Department are coming to their senses on that head. The way in which prizes, medals, and "honourable mentions," in all sorts of "grades," have been thrown about broadcast for the common-place work of beginners, has been quite absurd, and misleads pupils into thinking far more of these early efforts than they need.

The deputation which, on the 10th instant, waited on the President of the Local Government Board to ask for protection from the dangers of overhead wires, did not get very much for their pains. If a measure for changing the form of Government for the metropolis should come before Parliament in the ensuing session "it would probably be the duty" of Sir Charles Dilke "to consider

the question from the point of view of the metropolis, but he would be able to speak more definitely when the result of the legal proceedings taken by Marylebone and other parishes became known." Meantime the Post-Master General, it seems, has power to stretch and lay wires for telegraphic purposes where he chooses; and public and private enterprise, without any such authorisation, is visibly doing the same. If matters go on as they do a perfect spiders' web of metal wires will be woven over the roofs and streets of London. And not only will the strands of this web, when they happen to break, cut any one on whom they may fall as with the blow of a sabre, but, if they be conveying electricity of high tension, and only get a little out of place, the consequences may be no less disastrous.

We have received a letter from a correspondent in regard to our article on "The Enfranchisement of Leaseholds and Compensation to Tenants for Improvements." The gist of this communication is the question, "Who is to say what are improvements?" It may be useful to point out that in any Act dealing with this question, either a definition of improvements would have to be given, or they would have to be classified in a somewhat detailed manner, as in the Agricultural Holdings Act, which has just come into operation. This latter Act has finally put an end to the idea of mine, we do not say all country landlords, that they have a right to get as much money out of their farms, and do as little for their tenants, as possible; and urban tenants have so vastly multiplied that they are not likely to allow the old theory to remain long in force in the towns.

The Board of Trade, in accordance with the general opinion of the various local authorities of the metropolis, has intimated its official disapproval of the scheme for the amalgamation of the South Metropolitan Gas Company with the Gas Light and Coke Company. The announcement may be taken as a declaration that, in the opinion of the advisers of the Board, the possible economy to be effected by the consolidation of the administrations of the two companies was not so great as to allow of any reduction in the cost of producing gas that would compensate the customers for the increased powers sought by the companies. As to this there is no doubt that the amount of the possible saving to be effected by the amalgamation of either gas or water companies has been ridiculously over-rated. On the other hand, anything that should deprive the consumer of the advantage of the equitable bargain now existing in so many cases between the gas companies and their consumers, which is at the rate of an increase or diminution of 4*d.* per 1,000 cubic feet of gas for every 1*l.* per cent. of dividend, is one too obviously in the interest of all parties to be infringed on by a side wind.

THE "Société Centrale des Architectes," which was founded in 1840, "pour créer une distinction morale entre les architectes et ceux qui prétendaient l'être," announces a congress of architects, under its auspices, and in accordance with its provisions, but specially under the auspices of the "Société des Architectes et des Ingénieurs des Alpes-Maritimes," to be held at Nice from the 8th to the 12th of February. The list of subjects to be debated indicates the questions which are prominent just now in the consideration of the architectural profession in France. They are (1) the reform of the legislation affecting architects and engineers practising as architects; (2) the idea of a compulsory diploma for all persons practising architecture; (3) the means for bettering the education of builders and building operatives; and (4) the professional charges of architects. The first of these questions is one on which there is, among many French architects, a stronger and, we may add, a more chivalrous feeling than we commonly find in this country, a greater readiness to accept responsibility as the

guarantee of public confidence. The second we have dropped as impracticable; the third we have not taken up; the fourth is a "burning question," and it will be curious to see in what direction French opinion runs,—whether towards percentages or fees.

COMBINED LAND AND WATER TRANSPORT IN INDIA AND ELSEWHERE AND ITS RELATION TO INDUSTRIAL PROSPERITY.

INDIA is getting the start of Great Britain in making practical use of the information which has been collected and published by the Select Committee on Canals of last session. The great activity which is now displayed on the continent of Europe, especially in France, and in the United States, in providing manufacturers with the cheapest methods of transport, has not hitherto awakened much practical interest in the United Kingdom beyond the limits of the manufacturing districts themselves. And even here people seem waiting to see the result of the lead taken by Manchester. On the other hand, India possesses a system of railways which, as far at least as passenger traffic is concerned, are at once the cheapest in the world, and the most satisfactory as to their commercial outcome. With lower fares and lower freights than in the United Kingdom, some of the great Indian railways are worked at 10 per cent. less cost; and that 10 per cent., being calculated on the gross income, is really 20 per cent. on a comparison of the expenditures alone. No doubt the chief cause of the difference is the comparative cheapness of labour in India. Our usual calculation, which will be found first put distinctly forward in the "Work and Wages" of Sir T. Brassey, as taken from the ample experience of his father, the great contractor, is to the effect that the rate of wages does not make a material difference in the cost of work,—the better-paid man doing proportionately more work. As far as the mere exertion of strength is concerned, as in filling wagons, wheeling barrows, and the like, the view of Mr. Brassey is fully confirmed by the experience of half a century. But when skilled labour is required the case is different, and the experience of the Indian railways, on which natives have been gradually trained, under English workmen, to drive locomotives and to discharge other functions of which, twenty or thirty years ago, the Englishman had almost a monopoly, shows that what costs a shilling in England can often be done for an anna (1*d.*), or even less, in India. And thus a very good profit is earned by carrying passengers at 1*d.* (one-third of a penny) per mile, and even under that rate.

It speaks well for the enterprise of India that her men of business are not content to rest on their oars, satisfied with having so far beaten the mother country in the application of the most important of modern inventions. The immense water system of India allows of the solution there, on a very large scale, of problems of which the vital importance to the future of mankind is to some extent masked by the small size of the area of the British Isles. Thus, where we have an average rise, in running across the country, of from 10 ft. to 16 ft. in a mile, the long reaches of the Ganges Canal only fall at the rate of from 15 in. to 18 in. per mile, for sections of twelve and fourteen miles in length. Where we obtain from 45 ft. to 60 ft. in width for a water-way, an Indian canal is from 200 ft. to 300 ft. wide. Irrigation, too, little needed in this country, is in many parts of India essential to the agriculturist. It is thus not surprising that Indian men of business and of science have taken in hand the supplement and completion of the railway system by its older and not less important sister,—the canal system. The instance which has attracted our notice is the proposal to constitute a "Bengal Central Flotilla Company," with the object of establishing a river steam service in the delta of the Ganges, which the prospectus says may be regarded as a complement and auxiliary to the railway lines of the Bengal Central Railway Company, now about to be extended to Khowla. In happy contrast to the internecine strife between the canal and the railway companies of England, the Bengal scheme is brought forward under the auspices of the railway company, and will have the same board of directors and officers. The tract of country to be served by the flotilla covers an

area of 5,000 square miles, with a density of population amounting to 500 souls per square mile, or about two and a half millions of possible castomers. A daily service is to be established between Khoolla and the capital and chief centres of the district. The Post-office is to pay 400*l.* a year for the carriage of mails; and subventions of from 120*l.* to 600*l.* a year are offered by the various municipalities, on condition of the maintenance of a daily service, at fares not exceeding those charged by the railways. The sixty-two miles of the company's lines from Bongong to Khoolla will probably be opened on January 15th, which will place the last-named station in direct railway communication with Calcutta.

The capital for this undertaking, which only amounts to 100,000*l.*, will no doubt be raised in the locality; and it is not in the character of an investment that we call the attention of English readers to the scheme. The interest is far deeper than that which attaches to making one or two per cent. more or less on a given capital in a year. The mode in which we regard it is as an industrial phenomenon. India had attained a high degree of civilisation when the greater part of Europe was covered with impenetrable forest; and the people of India have attained an excellence in many kinds of workmanship by which Europe can show no rivalry. The famous Dacca muslin, for instance, is a woven cobweb such as no machinery has ever been able to produce. In India, moreover, cotton is indigenous. Not only so, it is the proper textile material of the country. Linen goods turn yellow in India; while cotton goods, under the fierce influence of their native sunbeams, preserve a beautiful whiteness. This is the reverse of what happens in the United Kingdom, where linen—a natural product of the soil, and a most remunerative crop in large districts of Ireland,—is as much the natural textile production as is cotton in India. What we think may be with some confidence anticipated, sooner or later, is the wedding of English capital and English science to the cheap labour and delicate manipulation of the Indian workman. The result bids fair to be the re-establishment of the prestige of Indian wealth, at all events, as far as those industries go which are appropriate to the climate. We are not without examples of this combination, although we are told that they are due to French rather than to English enterprise. The cotton factories of Pondicherry, wrought by steam power, are said to produce better and more durable napkins, table-linen, and the like, than Europe can make out of cotton. The whole history of the railways of India seems to us to indicate the probable rise of a great manufacturing industry in the great peninsula; an industry with which colder climates, with dearer labour, and the need of importing the raw materials, could by no means, in the long run, successfully contend.

If this be so,—and it will need a very strong case to disprove the view,—it offers but one more of those lessons, alike to the statesmen and to the manufacturers of England, which can only be neglected or misread at the risk of serious disaster. It tells us that, much as we undoubtedly owe to the unrestrained energy of private enterprise, such enterprise has a very sharp limit of success, or of duration, unless it be founded and maintained in accordance with the true principles which secure or forbid success. Physical conditions are not, in the long run, to be altered or evaded, either by the legislator or by the capitalist. Stories are well known of sanguine and resolute men, who have sunk fortunes in mining for coal in localities where the geologist could have told them in advance coal would not be found. Capital was there, and energy, and perseverance,—but there was not coal; and the effort was necessarily vain. As in the search for coal, so it is in the attempt to establish or to maintain any great industry. The knowledge of the expert is needed to insure permanent success. It is no reply to say that for generation after generation such and such an industry has been carried on at such a place, and that therefore it will always there flourish. That might, perhaps, be safely predicted, if circumstances remained unaltered. But we think few persons have realised,—we can call to mind no great public speaker or writer who has at all realised,—the character of the physical revolution which is going on around us. Steam has so far reduced distance as to place every part of the world in a relation to all other parts entirely different from that

which it occupied at the beginning of the present century. Land travel has been reduced in cost to less than one-fifth of its former rate, and the speed of transport by land has been more than quintupled. By sea, certain punctuality has taken the place of that old dependence on wind and tide that made the labour of the mariner almost as uncertain as its results as the wheel of the lottery itself. And the cost, for long ocean ranges, is reduced to something fabulously low. Under this new régime the natural advantages of each part of the world have a play which was undreamed of when we were busied in talking about the effect of changes in the laws, and vainly thinking that we could stimulate or control the operation of something far mightier than tariffs or fiscal rules. Before Brunel bridged the Atlantic, it mattered comparatively little at what rate of duty American corn should be admitted to our ports. Nor is it a matter to be settled at Westminster how far we shall continue to supply the markets of the world with textile fabrics, with iron, with steel, with machinery. Year after year such questions are settling themselves. Year after year local advantage more and more asserts itself. Who would have said, when George Stephenson was advocating, and the Aire and Calder Navigation Company were opposing, the North Midland Railway, that before the close of the century the ancient monopoly of steel manufacture would be reft from Sheffield by that very power of steam transport; and that the new canon would be laid down for the industrial manufacturer of England, "Either seek the sea-board, or bring the sea to your door."

But while statesmen and public writers have shut their eyes to what was going on around them, or only so far troubled themselves with it as to attempt to draw arguments for this or for that political cry from the symptoms of constitutional change in our industries, the builder has been more alive to the course of events. We mean, of course, the builder as the impersonation of the building trade. A change in the centre of gravity of the population is in course, and it is chiefly from our want of experience of the effects of such inventions as the telephone that we are unable to anticipate with certitude some of the details of that future change. We know, indeed, one or two of the controlling conditions. No place is likely to attract the builder's efforts that is not well served by railway communication. The need for telegraphic service has been acknowledged. The yet superior advantages of the telephone are well understood already in many places. How far this latter expedient may enable men to dispense with personal interviews, is the question that will decide whether our great cities and towns will continue to increase in an accelerating ratio; or whether habitations will spread more over the face of the country. And no less certain is it to those who take a comprehensive view of the case that water access,—by sea, river, or canal,—is becoming a prime condition for the situation of any factories in which matters of heavy weight are manipulated or produced. As to that there can, we think, be no doubt. It is of especial interest, therefore, to see how India acts in this matter. We do not say that Indian manufacture is likely, for perhaps many years, to compete with the cotton trade of England, except in the markets of India itself. But we say that, with certain exceptions, the conditions to be found in India are more favourable for a great manufacturing cotton industry than are those to be found in the United Kingdom. Our special advantages are:—First, coal, as to which we have no monopoly, and the use of which, in many cases, is likely to be superseded by petroleum. Secondly, the special skill, excellence, perseverance, and workmanlike qualities of the English workman. These, it is but too unfortunately well known, he has been disastrously counselled to postpone for other occupation of his time, with the view of raising his position, not by industry, but by political strife. The great elements of success or of failure to which we have referred can only be infinitesimally affected by the politician, even giving him all he asks. What can be done to keep our start in the markets of the world has to be done by industry,—industry under its three heads, that of the brain, as engineering science and skill; that of the arm, or patient, persevering, and well applied toil; and that of the pocket, the stored-up outcome of industry, which is needed to facilitate the working of the other

two. In all these we have to do our very utmost. If we thus pull together, we may fight the world for years, for decades, perhaps for centuries. But we have not an ounce of power to throw away, and unless we, all of us, not only do our best, but do it under the best advice, we shall drift, year by year, more hopelessly astern. And in thus doing our best we have to bear in mind that the conditions of maritime accessibility, which have been among the chief elements of our national welfare, have been affected by the change in the means of transport due to the locomotive. In the Appendix to the Report of the Select Committee on Canals (p. 232) will be found a table giving a comparative view of communications by land and by water in seven different countries. A special comparison of accessibility is found in that table, arrived at by dividing the area of the country by its sea-coast line. Thus, while England has 24 square miles of area to every mile of coast-line, France has 74 miles to be served by a single line of coast. If this view is carried further, and if we extend the coast-lines up the navigable rivers, we arrive at an element in the prosperity of different countries which is newly coming into prominence, and which has a weight of a remarkable kind. No railway extension,—according, at all events, to the view of Continental statesmen,—can weigh against the great feature of maritime accessibility; and it should be very instructive to us to see how this important fact is practically grasped by the directors of railways in Bengal.

THE FABRICATION OF THE ANTIQUE IN ART AND HANDICRAFT.

LITERARY forgery, if not so old as the hills, is at least an artifice of long standing. Though deception has been practised for several centuries in palming off inferior material and indifferent workmanship with the object of obtaining the best prices for the cheapest and least enduring work, the system of fraud was somewhat limited down to a late date. Some of our olden statute laws were very severe, and in connexion with our ancient guilds of trade the regulations were stringent and the penalties heavy for those masters and workmen who were found turning out work in their respective trades to the manifest damage and injury of the public. The era when good masters and men felt scandalised by the doings of the odd scamps in their respective trades we fear has long past, and we have hundreds, nay thousands, of producers and distributors in our midst who look upon deception wherever it can be practised with impunity and without detection, as a matter of "business." Thus we have fabrication in various fields of art and handicraft at the present hour, and a large purchasing public ready to believe in any assertion. People who are unwilling or ashamed to acknowledge their ignorance of the value of what they buy, are not the less easily duped. It is a good many years now since "Flint Jack" drove a good trade in fabricating tools, weapons, and other antiquities of the Stone Age. Before the roaring trade of the notorious Jack had a little clear light let in upon it, many a local antiquary, many curators of provincial museums, prided themselves on their lucky purchases, but though their illusions did not last long, it is a matter of certainty still that not a few private and public collections have a good many fabricated antiques on show. For several years past, in London, excavations occurring by the construction of railway works, and in sinking foundations for the deep basements of public buildings and warehouses, have led to the unearthing of *bond-fide* "finds" in coins, pottery, pavements, and other objects of the Roman occupation. The demand, however, of late years on the part of dealers in antique articles has exceeded the natural supply. The excavators, building labourers, and others engaged in work of the kind we have mentioned, knowing the desire that exists, are seldom without a few odd coins and other old metal trinkets in their pockets to dispose to the hunters after relics, who will often be found nowadays in the City hovering over new building foundations. Many real coins are undoubtedly unearthed on the exact sites where they are sold to dealers and relic-hunters, but that many more are not we have good reasons for knowing. We have plenty of coiners of counterfeit coin of base metal in our midst; to what extent the

fabrication of antique coins obtains in this country we are unable to say, but that certain fabricated specimens have been produced from time to time there can be little doubt. Common report credits Birmingham as the source of these sham antiques.

There are a number of poor or rather unfortunate artists in London and other cities who are in the hands of dealers in old pictures and paintings, and these artistic hacks are generally employed in the reproduction of the works of distinguished painters of a bygone day. Even copies of some of the Old Masters are executed to be sold as originals at auctions or to private purchasers. Among the class of paintings called "pot-boilers," which are produced by needy hack artists, are numerous landscapes and portraits and historic scenes. A number of this class of paintings, even though they may be termed original in one sense, are sold to purchasers as the works of painters who never painted them. They will probably give all the delight they are expected to give when hung in the drawing or sitting room of the retired tradesman who purchased them for the edification of himself and his amiable wife, who desire to show their visitors that they are lovers of fine art and patrons of our British artists. It would be well, we think, for our living and distinguished artists who wish to prevent fraud after they have passed away to adopt some system of registration in respect to their works as would place it beyond doubt what they actually produced in their life-time. Good judges of the works of the old masters exist in England and abroad, but genius is versatile in the fields of fraud as well as in honest art, and deception is always possible. The adept forger of an autograph is often successful, at least for awhile; and we must expect the same success for the skilful fabricator of a painting intended to pass as the original of a celebrated artist instead of a clever copy. The fabrication of entire works in sculpture, large or of life-size, for the purpose of deception or antiquarian "finds" has perhaps been rarely, if ever, attempted, though considerable suspicion exists concerning the discovery of minor pieces of sculpture unearthed or brought from abroad. Torsoes, legs, arms, and other pieces of the works of our ancient sculptors, have been excavated on historic sites, all bespeaking in their execution the workmanship of the Greek school, but, on the other hand, specimens of divers forms of ancient fictile art have reached us, and find a place in our collections, and of some of these we have no warrant that they may not have been imitations. A plastic material like clay, that can be readily moulded by the hands of the potter or the artist in stucco, affords facilities for fraudulent productions and their reference to a school to which they may not belong.

In the matter of the fabrication of antique furniture, or specimens of the cabinet and joinery work of the Elizabethan, Jacobean, Queen Anne, and Georgian periods, a high state of art and handicraft deception has been reached in London. The district where this class of counterfeit furniture is sold (if not manufactured there in all cases) is well known. We will not be invidious in mentioning streets; for, though much fabricated and vamped old furniture is on sale in the quarter alluded to, there are also at times some *bonâ fide* specimens of the Elizabethan and subsequent periods to be purchased in these antique furniture ware-rooms.

Whenever an old mansion of the Queen Anne or Early Georgian period is about to be demolished to make room for the speculative buildings of the present time, the fabricators of antique furniture, or their agents, are on the alert for bargains. That peculiar individual or contractor who has made his appearance in the building world of late years, and is known as the "house-breaker," and who is ready either to do the work of demolition for another, or to purchase the house and demolish it himself, with the hope of making a good profit on the sale of the different materials, pioneers the way.

The slates, bricks, stone dressings, doors and window-sashes, lead, paneled wainscoting, or wall-linings, staircases, twisted balusters and massive handrail and scroll, and so forth, are apportioned in lots for intending buyers. The antique furniture fabricator is chiefly concerned about the obtaining of the old panel-work mouldings, twisted balusters, moulded handrail, and massive scroll. If the joinery work is in oak, so much the better, and the greater the value. It does not matter if the old

joinery work is somewhat worm-eaten, for it will save the fabricator or his workman, the "worm-eater," a portion of the time required in perforating holes in the manufactured article to give it the appearance of the antique. Silk-worms can be cultivated with advantage; but science, to the great loss of the fabricators of antique furniture, has not yet discovered a method of utilising the labours of our wood-boring insects in a systematic way. Wood-boring beetles will only bore where and when they like. If they could be made to go to work *en masse* on a piece of antique furniture, and perforate or riddle it here and there where the fabricator will, the beetles would be a valuable class of insects for at least one class of the community. It may be asked, is a love of moths, beetles, and rottenness a sign of civilisation, even supposing they were all embodied in a genuine piece of antique furniture? The counterfeit cabinets, chests of drawers, side tables, chairs, and ladies' work-boxes, with their elaborate arrangements and secret drawers and sundry other objects, are now fabricated in the antique style in old moth-eaten timber or of wood counterfeited for the purpose. Although *bonâ fide* furniture turned out by the old cabinet and chair school of Chippendale, Sheraton, and Hepplewhite are to be picked up occasionally at auctions and at the warehouses of dealers, there are now a good many imitations of this school to be found in our cabinet warehouses, and some good and solid imitations too. Still, in our cabinet and chair industries there is a very large amount of furniture of the most flimsy and wretched character thrown upon the market, and the small chamber-masters and workmen who manufacture this furniture for some of the large firms receive prices abnormally low. Let us not be understood as saying that these smaller makers who manufacture pieces of furniture for the large firms, or on "spec" of chance of sale, do not turn out any good work. They do turn out sometimes excellent work, and are capable of doing honest labour, but they are martyrs to circumstances, and often, from the depression in their trade, they are obliged to sell their manufactured work to a class of grinding dealers who take advantage of their necessities and allow them scarcely any profit for their labour. Tables and cabinets, and suites of chairs and couches, are often manufactured of hard common woods, then stained and sold as fancy wood articles to purchasers who are easily imposed upon, through their inability to distinguish a doctored wood from the real wood. Those who do not know one description of mahogany from another, or real walnut, cherry, or laburnum from the pseudo stuff, should consult or employ those who do, or otherwise insist on a written guarantee that the piece of furniture they are buying is in workmanship and material what the manufacturer or seller asserts it to be. Then there would be a remedy, as the law provides a penalty for the obtaining of money under false pretences. There is a low class of second-hand furniture brokers who are also in the habit of manufacturing or getting made for them flimsy furniture in a rather old style, and by certain washes giving the new cheap mahogany or other wood a very dark and old appearance. Many persons who are on the lookout for fine old second-hand furniture, "as good as new," as the phrase goes, are taken in by devices of this kind practised by a tribe of unprincipled scamps, some of the fraternity being in league with mock auctioneers.

We could furnish many details of the fabrication of objects of art and handicraft, but what we have revealed, or might still reveal, would not of itself effect a radical reform. Cheap Jack is in unwholesome competition with honest workmanship, and ignorance in matters of art, fine and industrial, is still rife in the land. Men and women assume a knowledge of art and manufactured products that they possess not, and being too proud or too parsimonious to consult an authority to guide them in their selections, they find, when too late, their money has absolutely been thrown away in the procurement of sundry rubbish. Let no one be deterred from what we have written in adorning their homes with objects of art and skilled workmanship. Of olden and modern artistic creations, and of splendid workmanship of the craftsman's hands, are plenty of specimens in the land. We have living artists and workmen, too, who are

capable of doing all that may be reasonably required of them. We want, however, more of that kind of education that inculcates moral dealing, and that will evidence itself by men feeling themselves ashamed to be found out in doing an unprincipled act. The impartial administration of the law in the meantime may deter evil doers, whether they be common forgers or dishonest fabricators, of objects in the fields of art and handicraft.

HONOURS TO ARCHITECTS.

It will, we think, be generally admitted that in this country architects, in common with their brother artists, the painters and sculptors, have not been much favoured by the honours which it is customary for the sovereign from time to time to distribute. It is true that knighthood has been not sparingly bestowed upon the profession from the days of Sir Christopher Wren. The names of Sir William Chambers, Sir John Soane, Sir William Tite, Sir Jeffrey Wyatville, Sir Matthew Digby Wyatt, Sir James Pennethorne, Sir Robert Smirke, Sir Charles Barry, and Sir Gilbert Scott crowd instantaneously on the memory; but beyond this far from satisfactory stage of "ennoblement," royal favour has never ventured.

We all remember how Thackeray regretted the absence in our country of a "decoration" equivalent to the Legion of Honour in France, and the question remains still in the same unsatisfactory position. Very justly, poets-laureate, as well as wealthy brewers, are considered not inadequate representatives to swell the benches of the Upper House, but knighthood is regarded as a sufficient reward for artistic merit.

We, in England, are not accustomed to regard matters from a more strictly aristocratic point of view than the Austrians and Germans, yet it is somewhat singular that in this direction a far more appreciative and flattering view of the artist's place in the social economy is taken both in Germany and in Austria. In comparison with our merely distinguishing knighthood, shared literally by all sorts and conditions of men, the hereditary and ennobling "Von" confers a dignity which may be said to be of a truly enduring nature and of far more meaning than its mere grammatical equivalent "O," "Mac," "Ap," "De," "Di," and its numerous polyglot variations.

Only a short time since reference was made in these pages to the great architectural improvements which have been carried out in Vienna. On the Franzens Ring, in which the chief monuments of the new capital have been erected, the Votiv Kirche and the University are the work of the late distinguished architect, Von Ferstel, ennobled some time ago as a Freiherr or baron solely on account of his professional eminence. The venerable architect of the newly-erected Houses of Parliament was knighted for his services, Ritter von Hansen. Hasenauer is, if we mistake not, also a Freiherr and a "von." It is only from the strength of his convictions that Schmidt, the architect of the new Rathaus or town-hall, refused the title offered to him by the German emperor, and it was on similar grounds that the late lamented architect, Semper, died a simple Herr. As we write, there occur to our mind the names of the Ritter Heinrich von Förster, Carl von Lützow, Ritter von Rigel, von Gärtner, and von Klense (the favourites, it may be remembered, of that princely patron of art, Ludwig of Bavaria), the Freiherr von Söcken, and von Gerstner, the eminent engineer.

The list would be long indeed were we to mention a tithe of the distinguished French architects who have received the honour of the various grades in these pages a few days since, the venerable Dean of the architectural section of the French Academy of the Fine Arts, J. B. Lescaur, died an officer of the Legion of Honour. At the present moment, among his late colleagues, M. Ballu is "commander" of the same order, as also M. Bailly; M. Garnier is an "officer" in company with M. Vaudremer, M. Questel, and M. Abadie.* It is noteworthy, by the way, that one of the most eminent of the foreign associates of the French

* Only a few days since the French *Journal Officiel* announced the nomination as Chevalier of the Legion of Honour of M. Paul Fouquain, the architect of the Amsterdam Exhibition, of the greater part of the new Quartier Marbeuf in Paris, as also a large number of *cités ouvrières* or artisans' dwellings in the French capital.

Academy, the venerable Professor Donaldson, has, like more than one other English artist, received from a foreign nation a far fuller acknowledgment of his services to art than from his own countrymen. It may be mentioned in this connexion that John Martin, the painter, was, in company with Lord Durham, the first Englishman to receive the honour of the knighthood of the Order of Leopold on its formation. The recent deaths of the Chevalier Albano and the Conte Vespignani, the architect of St. Peter's, will be present to the memory of many readers.

It is now happily an exception rather than the rule for authorities in power to hold out two fingers to an eminent architect as a Minister many years ago is known, let us hope thoughtlessly, to have done to the deceased architect of the now so sadly-abused Law Courts, yet the unfortunate incident is, perhaps, not untypical of the light in which the ill-trained English mind regards the artist, using that word in a sense in which we feel it quite possible that we may be misunderstood, so little do we in our country appreciate generally the ordinary vocabulary of art. Stoutly as the architect would claim the right to be an artist, we wonder how many persons in a representative English drawing-room would mistake his claims to the title if it were explained that never in his life had he painted a picture?

THE CIRCULAR OF THE TOWN CLERK OF THE CITY OF LONDON AS TO THE CORPORATION WATER BILL.

It is difficult to read the circular addressed by Sir J. B. Monckton, the Town Clerk of the City of London, to the various local authorities, without coming to the conclusion that the writer or writers have not taken the trouble to read the evidence on the subject with which they propose to deal that is contained in the Blue Books. Otherwise they could hardly prepare so violently to force an open door. For it is clear in that evidence that the best servants of the water companies,—taking such a man, for example, as Mr. James Muir,—are as anxious, in the interests of their own shareholders, to effect certain changes, as the officers of the Corporation can be. Only, having a practical acquaintance with the subject which the outsiders have not, the engineers of the companies are aware where the real difficulties lie,—difficulties of a nature with which Acts of Parliament are wholly unable to contend.

Thus no one more deplorable the waste of water than do the water companies' engineers. No one could be more desirous to take measures to prevent it, and to restrict supply within strictly useful limits. For waste is injurious, not merely as causing loss of water, but as deteriorating all connexions, pipes, and fittings. Thus the introduction of constant supply is an object which the water companies have shown that they have much at heart. And if any practical mode of selling water by meter can be pointed out, it will no doubt be welcome as tending to prevent waste.

But here comes in the constant difficulty,—“Who is to pay for the cost involved?” The companies might, it may be said, supply meters as do the gas companies, on rental. But who is to pay for the cost of fixing, which is a much more serious matter under a pressure of 100 ft. or 200 ft. of water than under the half-inch of water pressure required for the flow of gas? And how much will be added to the 63d. per 1,000 gallons at which Sir J. B. Monckton averages the cost of the London water supply, in order to pay the rent of the meters?

The first clause, then, of the Bill, appears simply to evince ignorance of the nature of the difficulties which all parties desire to see removed. As to the other three clauses, the question arises whether the introduction of a hostile measure on the part of the Corporation is the best mode to attain their objects. These clauses must be one of two things,—declaratory of the law, or modificatory of the law. In the first case, supposing them to be passed, an appeal to the courts of law will be the first result. No brand-new legislation is at all certain as to its effect until it has thus been tested and overhauled by the practical wisdom of the tribunals. A declaratory Act, then, in the present circumstances, is mere waste of time and money, as the opinion of the Courts, which decides the application of the actual law, can be obtained

as readily at the present moment as it can after a new complication is added to the statute-book, by way of “declaration.”

If, on the other hand, the Corporation seek not to declare, but to change, the law, it should not be attempted by a side-wind. The whole matter will, no doubt, be obstinately contested by the water companies; and not only so, but to a great extent the sympathies of all the owners of property will rather be with the latter than with the Corporation, whose sudden zeal for reform in the matter may provoke some question. The true ground on which to fight against any increase in the legal powers of the water companies, or to endeavour to obtain any better terms from them, is that of the introduction of Bills by the latter for the increase of capital. In the case of each of the companies, such application must be made within four or five years at the outside. Then will be the time for water consumers, local authorities, or other *ayants droits*, to intervene, if only the public knows what it really wants, without undue expense or suspicion of any undeclared motive for action.

THE OLD CHANCERY COURTS, LINCOLN'S INN.

HE who has not passed through Lincoln's Inn during the last two or three months, will now see that in the interval the Law Courts there have disappeared. Their functions, indeed, had ceased with the opening, some twelve months since, of the neighbouring Royal Palace of Justice. The ugly building which not only disfigured Old-square, but obstructed a view of the chapel and old hall, Lincoln's Inn, was erected in 1841, when, by an Act of that same year, two additional vice-chancellors were appointed, owing to the rapid increase of Chancery business. With the death of Sir Lancelot Shadwell (August 10, 1850), the style and dignity of Vice-Chancellor of England died too. He used to sit in what the present generation best know as the late Vice-Chancellor Maline's Court, being that near to the Brewster memorial gates, set up in 1801 at the southern side of the garden. That court was erected in 1819, the outer corridor, a portion of which remains, having been built at the same time. It was designed in conformity with the more modern aspect of the old hall and adjacent council-chamber, as transfigured and defaced at the hands of Bernasconi in 1800. Just thirty-two years ago two new judges were appointed, with the style of Lords Justices of the Court of Appeal. They, together with the Lord Chancellor, occupied two courts made out of the once “goodly hall,” which, itself the most ancient existing part of the Inn, was built 22nd Henry VII. in place of one that had been pulled down some ten years previously. Frequently altered, lengthened by 10 ft. in 1819, a coved ceiling substituted for its fine, open oak roof, and finally despoiled of its heraldic achievements in stained glass for decorating the eastern oriel of Hardwick's new hall (1845), it is difficult to picture the fabric as it was in the days of dancing and revels of Queen Elizabeth, or of the grand entertainment given here in 1671 to King Charles II. and the royal princes. What yet survives of Old-square is singularly picturesque, affording some fine examples of Tudor and Jacobean brickwork; though amongst the best were the chambers recently removed for the lengthening of the chapel, and those which have given way to Sir George Gilbert Scott's latest work. But here again we look in vain for the former arched doorways, and find that as the windows are but a sorry exchange for the original lattices and stone mullioned windows, of which latter two, however, remain *in situ* just south of the gatehouse, Chancery-lane. The Six Clerks have gradually exhausted their liberal pensions; the Record and Writ Clerks are become Masters of the Supreme Court; the Benchers have retaken possession (for chambers) of their former premises in Stone-buildings, and, it is said upon the agreement to recover at no advance upon the original sum. In this case, bearing in mind the greatly-enhanced value of property here, the authorities of Lincoln's Inn are to be congratulated upon a transaction to them so profitable.

St. Mary's, Witney.—A series of stained-glass windows, from the studio of Messrs. Clayton and Bell, has been placed in the chancel of St. Mary's Church, Witney.

FOREIGN NOTES.

THAT the serious and absorbing character of the architect's pursuit may, without injury, be alleviated from time to time by a little harmless gaiety, is, we think, amply shown by the life of the late eminent architect, J. B. Lesueur. Since his death a great deal has been said concerning his many services, professional and literary; but though a compatriot has, it is true, informed our readers of the late architect's skill as a poet, few are aware that Lesueur was the founder of that joyous social corporation, still alive after considerably over half a century of existence, which, bearing the pompous designation of the *Société Amicale des Pensionnaires de l'École de Rome*, is more familiar to the artists of France and Italy by the less dignified title of *La Soupe à l'Oignon*, and fewer still, we expect, know that the grave and learned member of the French Institute was, quite late in life, the author of the song in praise of the homely onion, which gave its name to the society, a song which is still fresh in the memory of the small and select body of the initiated into the secrets of this almost Freemasonic body. The constitution of the society carries us back to those good old days of unaffected simplicity and camaraderie between artists which it is complained, and not unjustly, are fast becoming a memory of the past. As long ago as 1817 a party of the young French students of the historic Villa Medici, at Rome, had planned an excursion to the *campagna* which surrounds the Eternal City. Encamped under the shadow of the so-called tomb of Cecilia Metella, the neighbouring *osteria* or inn was discovered to have nothing to feed sixteen hungry students but a basketful of onions. It was here that the genius of the young architect, Lesueur, showed its latent ability for the mysteries of the kitchen, and before long a fragrant onion soup was served to the united party within the classic walls of the old tomb. Washed down by some of the honest white wine of Grotta Ferrata, the feast served as the foundation of the society to which we have alluded. Lesueur appeared in a new capacity as poet, and in a series of humorous alexandrines sang the origin of the society, which from that moment was constituted on bases which have stood the test of hard on sixty years; the society still meets in Paris on the first Wednesday of every month. A great many years ago M. Lesueur once again developed his poetic vein in the song, “Vive l'Oignon,” and which, sung to Béranger's famous air of “Les gueux,” tells the praise of the humble vegetable. Considerations of space forbid our reproducing the poem; one verse must suffice:—

“Quand sur des sables arides
De temps bravaient les feux
S'élevaient les pyramides,
Qui nourrit leurs constructeurs?
L'oignon! l'oignon!
Digne de renom
Nous donne son nom.
Vive l'oignon!”

Not only the artistic world but the crowd of travellers who at this season hurry southwards to the overcrowded Riviera, and, let us add, the still more numerous readers of Bulwer's “Rienzi,” will hear with pleasure that steps are to be taken by which the picturesque palace of the popes at Avignon will shortly cease to be desecrated as a barrack. At a recent meeting of the French Commission of Historic Monuments,—a body the formation of which we still await in our country,—M. Boeswillwald, the well-known architect, reported the desire of the municipality of Avignon to convert the papal palace into a national museum. The report will be submitted to the Minister of War,—the palace being as above stated at present occupied as a barrack,—and there is every hope that before long the romantic old pile will be restored to a condition more in consonance with the many historic and artistic memories associated from Medieval days with its feudal gloom. Were there, however, no traditions of the presence of Giotto, of Petrarch, and Rienzi, and the splendour of the exiled papal court to lend the halo of romance to the ruined palace, its architectural interest alone would merit a worthier fate than has so far befallen it battered but still stout walls; all lovers of the beauty of Medieval art will, therefore, join in rejoicing at the promised restoration,—rather let us say, in view of the bad odour in which that word is held by some, conservation,—of the palace of the popes at Avignon.

The series of disrespected smart things suggested by those two grand architectural creations of recent days, the Law Courts of London and of Brussels would seem still far from exhausted. We in our country have, it is true, already grown a little wearied of the subject, though there are grim wags who are still to be found chuckling over the,—according to them,—well-merited sufferings of the lawyers in their new home at Temple Bar. In Brussels, however, the new Palais de Justice is still sufficiently an "actuality" to afford a novel fund of attack for the satirists. The latest piece of humour which has reached us is a clever sketch of an unhappy prisoner in full evening dress being brought into court between two magnificent *gens-d'armes*, "sables and starch" being assigned to the culprit as necessary to be in complete harmony with the grandeur of the general design.

We learn, by the way, that the architect Beysaert is to be entrusted with the rebuilding of the recently destroyed Belgian Palais de la Nation. Beysaert, it may be remembered, is, among other works, the architect of the Banque Nationale at Brussels.

We are reminded of a question, which has often excited discussion in this country, the many absurdities of our metropolitan street nomenclature, by the recent action of the Paris municipality in determining to give to one of the streets of the French capital the name of the venerable, and, happily, still living savant Chevreul, to whom the artistic world owes something more than an ordinary debt of gratitude for his many admirable discoveries and his scientific study of the laws of colour. "Le bon papa Chevreul," who is now no less than ninety-eight years of age, has, under circumstances which have excited some little indignation, been deprived of the post he has long held as Director of the Gobelins Tapestry works, where he has delivered those interesting lectures which have revolutionised the older theories of the harmony and contrast of colour. No artist, no artisan, no designer, and no critic can afford in the present day to be unacquainted with the researches of Chevreul, and, complicated though they may appear in their definition, their mystery, once grasped, places the student in a position of such manifest mastery over the subtle laws of colour, of contrast and harmony, as to give him an advantage which none in these days of fierce competition can afford to forego. The Paris municipality, in determining to honour Chevreul by giving his name to one of the thoroughfares of the French capital, has not only acknowledged the merit of the venerable savant, but, to return to the statement at our outset has helped to solve a question which, in this country, has more than once come under discussion,—the absurd and puzzling anomalies of our street nomenclature, with its innumerable King-streets and Queen-streets and Charles-streets, and so on. In the French capital no two streets have the same name, while honour is done to the memory, not only of great Frenchmen, but the famous men of all countries, by giving their names to thoroughfares. There is, let it be observed, more than one English name thus immortalised. It is true that in London, in the classic neighbourhood of dingy Drury-lane, some of the streets have been re-named, and the names of Macklin, Betterton, and Kombe have been kept alive after a fashion which is, after all, scarcely complimentary. Milton's revered name has been, singularly enough, given to the Grub-street of a literary past,—past, in more senses than one. In new suburbs fancy has, it is true, been a little freer, and famous names are to be met with in the wilds of greater London, though the susceptibilities of inhabitants are, it would seem, occasionally roused, as in the case, which will not be forgotten, of a thoroughfare in Putney named after the late Earl Beaconsfield. But it is within the boundaries of London proper that there remains so much to be done in re-naming the bewildering thoroughfares after some such logical fashion as our Parisian neighbours, who, however, none the less sometimes contrive to carry their logic to extremes when, for purely political reasons, they change the names of thoroughfares which have long been familiar to foreign visitors to the banks of the Seine. To find in the neighbourhood of the so-called Quartier de l'Europe streets bearing the names of the various European capitals,—the Rue d'Amsterdam, the Rue de Londres, &c.,—is essentially logical, and until some such logic (for the American system of numbers is out of

the question) is introduced into our large metropolis, the most bewildering mistakes must continue to be made.

ON THE SCIENCE OF MECHANICS AS APPLIED TO THE FINE ARTS.

UNDER this title Mr. George Simonds, the sculptor, read, at the Civil and Mechanical Engineers' Society, on Wednesday evening, a paper of rather unusual interest, as an artist's statement of the details of the mechanical side of his art. After some preliminary remarks on the general subject of the relation between mechanical and artistic power, Mr. Simonds proceeded by first drawing attention to the remarkable practical problem presented by the execution of the colossal statues of Egypt, works on such a scale and in such hard materials that numbers must have been employed on them at once:—

The erection of pyramids and obelisks by a people who had neither steam power nor hydraulic machinery at their command excites our just admiration; but although it argues a certain mechanical knowledge, it does not prove an acquaintance with more than the simplest mechanical appliances set in motion by a boundless supply of brute force. I do not, therefore, insist on these works, wonderful as they are, as showing any great influence of mechanical science upon art; but with Egyptian sculpture the case is different, and I would submit that without mathematical and mechanical knowledge of a high order it would have been quite impossible for any people to have erected such colossal works as the Sphinx, the Memnon, and many others. The methods employed by them for working the hardest and most intractable materials have been, and to a great extent are still, matters of conjecture, although it has recently been discovered that for certain purposes they made use of a tool in its action exactly resembling a modern diamond rock drill. To me, however, it seems less wonderful that they should have been able to master the hard material, than that they should have succeeded in giving pleasing expression and accurate proportions to works of such vast size. It is evident that they must have been hewn out by the united action of many men working at once; no one man could have achieved such a task. There must, therefore, have been a design for them to work to. And to produce a satisfactory result mathematical principles must have been skilfully applied to the enlargement of the small model.

In the British Museum there is a small stone lion, of Egyptian origin, marked over with lines intersecting each other at various angles, which, I think, was in all probability a small model from which to construct a similar lion of much greater dimensions.

The art of Egypt probably derived, for a time at least, great benefit from the rules and restrictions imposed on it by the priesthood; nevertheless, the system must have had its drawbacks, for if it prevented extravagance and absurdity, it also effectually precluded progress even of a legitimate kind. The same observations apply with equal force to Assyrian art, from which, but for such restrictions, as great results might have been expected as were afterwards obtained in Greece.

With the Greeks the case was, of course, very different. It is true that they derived their knowledge of the arts and sciences from Egypt, but they had not the same religion, and not being governed by a priesthood, they had no reason for observing the rules and traditions of Egyptian art for one moment longer than they found it convenient to do so. Thus we find that even in the early days of Greek art, when its character is quite archaic, the figures are full of movement and energy, and before long the faces only seemed to retain traces of Egyptian influence; as, for instance, in the *Agina* marbles now in the museum at Munich, which, although carved only about forty years before the time of Pheidias, when Greek art suddenly rose to its highest, nevertheless in some little peculiarities of form and feature show their Egyptian descent.

Amongst the Greeks about this time art and science seem to have made most rapid progress, and sculpture and architecture must have received great assistance from the schools of Euclid and other mathematicians of that day, whose teaching would be invaluable to an artist in assisting him to understand the laws

governing the constructive movements and balance of so complicated a piece of mechanism as the human form; and it needs, I think, little argument to show that, other things being equal, the man who will make the best machine drawing is he who best understands the machine it represents. So it is with the representation of the human figure, more especially in sculpture, for in painting colour and chiaroscuro are like charity, which often covers a multitude of sins. In sculpture, however, colour cannot be made to gloss over faulty and unmechanical construction, and, though many sculptors at the present day, of the so-called naturalistic school, endeavour to give an air of reality to their works by imitating the texture of the skin and other minute details, they often grossly neglect the correct mechanical construction of their figures, so that, even if they were suddenly to come to life, they could not move, their machinery being ill-designed and badly-fitted, even though, to the unmechanical eye, it may look well enough and very highly finished.

Construction, movement, and balance,—the three great points to be observed in the artistic representation of living forms, are all dependent on definite mechanical laws; and we have abundant proof that the Greeks were quite alive to this fact, and closely studied the laws that led, in their case, to such brilliant results.

Unfortunately, but little has come down to us of the formulae they used. Something, however, we have; not much, indeed, but just enough to show us how much we have lost. I refer to the *norma* or canon set forth by the sculptor Polykleitos, a very defective account of which has been handed down to us by Vitruvius, who himself does not seem to have been very clear about it.

In the early part of the Christian era art and science both fell to a very low ebb. Art, indeed, was so poor, that when the Romans wished to build a triumphal arch in honour of Constantine, they were obliged to despoil other pre-existing monuments in order to adorn the arch with sculptures which they had not the skill to execute themselves.

It was not until the revival of art and science in the Middle Ages that we have anything of note to record; but in the fourteenth and succeeding centuries we are met with a multitude of names of highest fame. In those days we find men who were, like Leonardo da Vinci, engineers, both civil and mechanical, as well as sculptors, painters, architects, and who yet found time for the study of poetry, music, and astronomy.

Previously to this great revival the mechanical processes of art had been utterly lost; and even at the present day we know but little of the systems whereby the ancients produced their masterpieces. Curiously enough, we have but few unfinished works of antiquity, and these few throw very little light on the system of measurement they employed. We know, indeed, from the many works in terra-cotta that have survived that they were skilful modellers, and we know also that they were acquainted with the properties of plaster of Paris, as it is commonly called, and that they were skilful moulders, but we do not know how they reproduced in marble the forms they had designed in plastic material,—we do not know whether they were in the habit of making full-sized models of their statues and copying them in marble, or whether they usually made small sketches in clay or plaster, and enlarged from these. As far as their tools are concerned, we know from the marks that they have left that they were almost identical with those that are in use today. They used a point tool for roughing down, which was simply a piece of rod drawn down to a square point, with which they wedged off lumps of marble with a hammer. Having reduced the block to a rough shape, they then bought it still nearer to size with a flat chisel, the edge of which was serrated; and the work was finished with ordinary chisels of various sizes, and with rasps. All these tools were doubtless precisely the same as those used in the Middle Ages and at the present day. They also used a drill for removing marble in the under-cutting of draperies, and in other parts where it would have been difficult or dangerous to use the hammer and chisel. There is nothing to show how the motive power was applied to these drills, but there is at least a probability that it was a reciprocating motion produced by a cord wound round the shaft of the drill, and kept tight by a bow, and worked by the carver himself; or else the two ends of the cord may

have been worked by an assistant, whilst the carver guided the drill. This latter is the method usually employed in Italy at the present day, as it leaves more freedom to the carver than when the bow is used. Having both hands at liberty, the carver can use his drill as a slotting-tool, cutting curves as easily as straight lines. I have, however, never seen any evidence that the ancients were in the habit of so using this tool; on the contrary, wherever I have seen the drill marks, they have been clear, distinctly separate marks, with no indication whatever of a side traverse.

In the Middle Ages they do not seem at first to have had any very clear system either of proportion or of measurement, and the mechanism of the human figure was very imperfectly understood. As a natural consequence the figures produced at that time were grotesque, not to say incorrect, in action, poor in form, and bad in their proportions. As, however, the laws of mechanics were more studied, and the art of construction was so well understood that it became possible to erect such structures as the bell-tower of Giotto, and later Brunelleschi's dome, the art of sculpture made corresponding strides. The discovery of fragments of antique art gave an impetus to the study of the beautiful, and the proportions of the figure were reduced to a truer standard; whilst the study of anatomy, although not permitted, was ardently practised by some few artists, and resulted in correct mechanical construction and harmonious movement. The parade of anatomical knowledge has often been made a reproach to Michelangelo by those who were too ignorant to understand him; and, indeed, to a superficial observer there would seem to be some reason for censure. Yet there is not one of his figures that is not full of life and energy. The carving is often very rough; the figures are rarely, if ever, finished in all parts; but one feels that the mechanical construction of the figure is correct. It may be exaggerated, the man may be a man of forty horse-power, but nevertheless he is a man with the limbs and joints of a man,—correctly articulated, with possible, not impossible, muscles and tendons,—muscles which need only the vital spark to contract and set the limbs in motion. These figures possess, in an eminent degree, that highest of artistic qualities, potentiality of motion.

The accounts we have of Michelangelo's method of working are not so ample as we could desire. We have, however, a diagram from his own hand for calculating the proportions of the human figure, and we have in the writings of Leonardo Cellini, who was himself acquainted with the great master, what professes to be an account of his system. We have also a vast number of small models and studies in wax and in terra-cotta for large statues, but we have no full-sized models; from which we may, I think, conclude that he made small-sized models when the work was to be executed in marble, and full-sized ones only when it was to be cast in bronze; when, as the *cire perdue*, or lost wax system of casting, was the one he employed, the model would be destroyed in the process. According to Cellini his plan was to sketch with charcoal on one side of the block the outline of the figure he wished to carve, and that then he at once attacked the block, and, working always from the same side, produced the figure first as a low relief, then in ever-increasing relief, until it stood out freely in the round. To any one who knows the practical difficulties of sculpture this sounds very wonderful, and, although I am far from saying that it is impossible, yet, knowing Cellini's love for the marvellous and his hero-worship of Michelangelo, I am inclined to take this account with some reservation. That Michelangelo could carve a statue without mechanical aids I will not dispute, but that he should have found it convenient to do so is impossible. A scale for proportional measurement was invented by him for the use of sculptors, and is still the most convenient known and the most simple.

The system of measurement which has been general in Italy for a vast number of years, though there is no record of when it was first used, is a system of triangulation. A model is produced of the same size as the proposed statue in marble. On this model three principal points are determined: two on the base as far apart as possible, and one as near the top of the statue as practicable. A sort of T-square of wood is then constructed, which has a steel point at

at the end of each of its three arms, and is of such proportions that the steel points rest each on one of the three principal points on the model. This T-square is then transferred to the block of marble, and the three principal points are assumed where the three steel points rest on the block. It is obvious that with this arrangement any point on the model can be easily obtained on the marble by the use of ordinary compasses; for if we measure the distance of the required point from each of the three principal points on the model, and also measure the depth in, from a point assumed on the T-square, and transfer these measurements to the marble, we shall be able, by carefully cutting away the marble and repeated trials, to find with extreme accuracy a point which will coincide with all the four measurements, and which is the point required. In this way point after point can be found all over the figure, and a replica in marble of the original model is produced with mathematical accuracy. The introduction of this system was obviously of the highest importance to art, as it enabled the artist to depute to his assistants the roughing out and preparing of the work in marble, thus economising his own time and labour. This system, however, perfect as it is in the hands of careful and skilful workmen, is not altogether without drawbacks. Mistakes may arise from a careless workman taking one pair of compasses for another, or from want of accuracy in measuring from point to point; also there is a great loss of time from the fact that each point requires at least three measures to be taken. To obviate this inconvenience, what is known as the scale stone instrument, was invented, I believe, in England, where alone it obtained any considerable use. The instrument consisted of two blocks of stone, one, and sometimes more, sides of which were squared up true with the surface. An iron bar, formed like a strap, passed horizontally along the true-up side. Between this strap and the side fixed an upright, held in place by a wedge. An arm moving on a universal joint was fastened to this upright, sliding up and down it on a sleeve. At the extreme end of this arm was another universal joint, with a short arm bearing a pointer or needle. All these joints could be clamped immovably. The model being fixed on the one scale stone, and the block of marble on the other, the upright was now placed in the strap and tightened up by the wedge. The arms were now moved until the pointer rested entirely on the point to be transferred to the marble; all the joints were then clamped up, except the needle, which had a little stop put on it, and was then withdrawn, it being fitted in a slide. The wedge was then loosened and the instrument transferred to the other scale stone,—wedged up, and the pointer slid forward,—the marble being cut away to allow its motion until it came against the stop, its point touching the marble at the same time indicated the exact point required. This instrument had many good qualities, but the use of scale stones was highly inconvenient, and, although it was popular in England, the foreign artists would not use it, as they found that the saving of time was more than counterbalanced by the inconvenience of being unable to move the work; and, moreover, they accused the instrument of being inaccurate.*

PROFESSOR NEWTON'S LECTURES ON MONUMENTS OF LYCIAN ART.

THE first of Professor Newton's course on Lycian art was delivered at University College on the 4th inst., and contained a description of the physical features of Lycia and a sketch of its history up to the time when it was merged into the Roman Empire. Lycia may be called an ancient Switzerland; but it was a Switzerland with a seaboard. Intersected by mountains, the height of which ranged from 20,000 ft. to 6,000 ft., with fertile plateaus and valleys at rare intervals, and with excellent harbours along the coast, Lycia was a country of which the conformation favoured the distribution of the population into autonomous districts something like Swiss cantons. These were united in one common confederacy, called the Lycian League, the constitution of which formed the subject of a special treatise by Aristotle, now unfortunately lost.

The first notice we have of the Lycians is in Homer, where the heroes, Glaucus and Sarpedon, appear as allies of the Trojans, where we have notice of the myth of Bellerophon and of the Solymi, a Semitic race, who appear to have been driven into the mountains which form the Eastern boundary of Lycia by the Tremile, an Aryan race, who gradually became mixed with Greek settlers on the coast. After this fusion of the Tremile and Greeks had taken place, Lycia was conquered by Cyrus B.C. 540, and appears to have remained more or less under Persian dominion till the time of Alexander the Great, after whose death it passed into the possession of the first Ptolemies, and, after various vicissitudes, finally became part of the Roman Empire, being allowed, however, to retain the organisation of its League, with diminished powers, till the time of the Emperor Titus, by whom the confederacy was finally abolished.

In his second lecture, on the 11th inst., Professor Newton noticed at the outset the various travellers to whom our present knowledge of Lycia is due, and whose explorations commenced at the beginning of this century, when Sir F. Beaufort first laid down the correct outline of the coast. To Sir E. Fellows was due the merit of having discovered the city of Xanthos in 1838, and it is mainly to his exertions that we owe the remarkable set of Lycian sculptures now in the British Museum. The lecturer then described the more ancient of these sculptures which are to be found in the Archaic Room at the British Museum. Of these the most remarkable are the reliefs from the so-called Harpy Tomb, the original form of which was a square pillar, with a small chamber at the top surmounted by a cap-stone, the whole being about 20 ft. in height.

In form this monument closely resembled the tomb of Cyrus, as described by Strabo. The reliefs which decorated the four sides of this tomb were all undoubtedly funeral. At two of the four corners were Harpies, the symbol of sudden death, carrying off diminutive draped figures, probably representing souls; on the west front there were two seated female figures, perhaps Demeter and Persephone; on the opposite side, a warrior offering his helmet to a male seated figure; and on the north and south sides respectively, a group of a seated figure receiving other offerings. The lecturer then examined the rival schemes of interpretation which have been proposed in reference to these reliefs by Brunn, Curtius, and others. Not one of these schemes has commanded the general assent of archaeologists. He then made some critical remarks on the style of the monument, the date of which probably ranges from B.C. 520 to 500, though it may possibly be earlier.

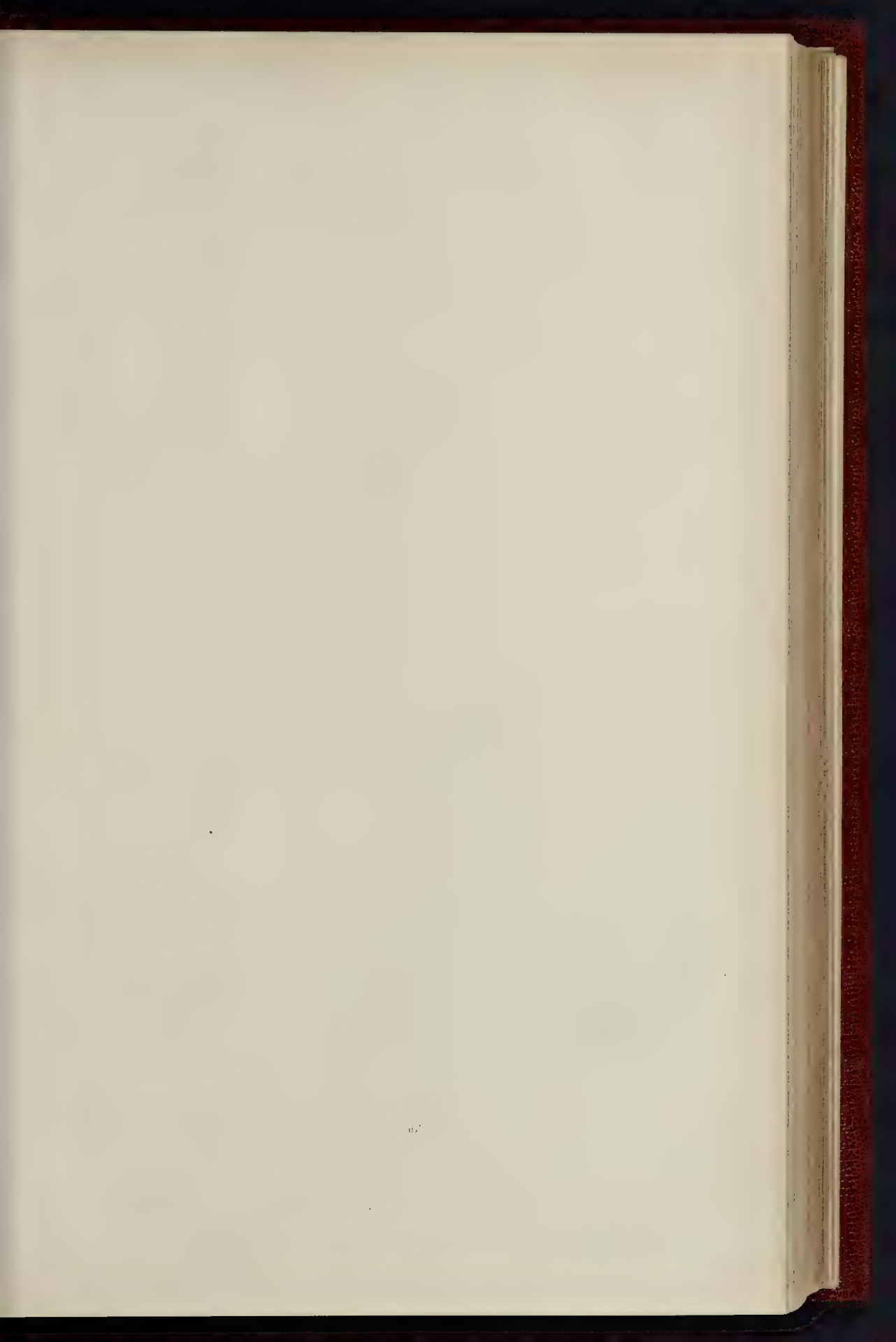
THE WALSHAM MEMORIAL TOWER, ALL SAINTS' CHURCH, MARGARET STREET, HULL.

THIS church is beyond doubt the finest, architecturally considered, of any modern church in Hull; designed by the late Mr. G. E. Street, R.A., and carried out in his characteristic style.

The design for the tower was submitted in a limited local competition by Mr. Samuel Musgrave, architect, of Hull. The tower was intended as a memorial of the late Canon Walsham, M.A., the first Vicar of the church, who died in 1862. The style and detail of the church are strictly followed in the design for the tower, and it was proposed to be erected in local brick-work and Ancaster stone.

Building on the "Mulberries" Estate at Camberwell.—The old estate at the beginning of Coldharbour-lane, Camberwell, known as the "Mulberries," is about to be laid out for building purposes, and on Tuesday the building materials of the mansion, out-buildings, and grounds were sold. The estate covers an area of about 10 acres, upon which it is intended to erect upwards of one hundred houses, together with a number of shops. In addition to the materials of the mansion and various buildings, the sale included the whole of the growing timber on the estate. A portion of the estate has been disposed of to the London School Board, who are erecting a school on the site.

* The remainder in our next.





CHURCH OF ALL SAINTS HULL

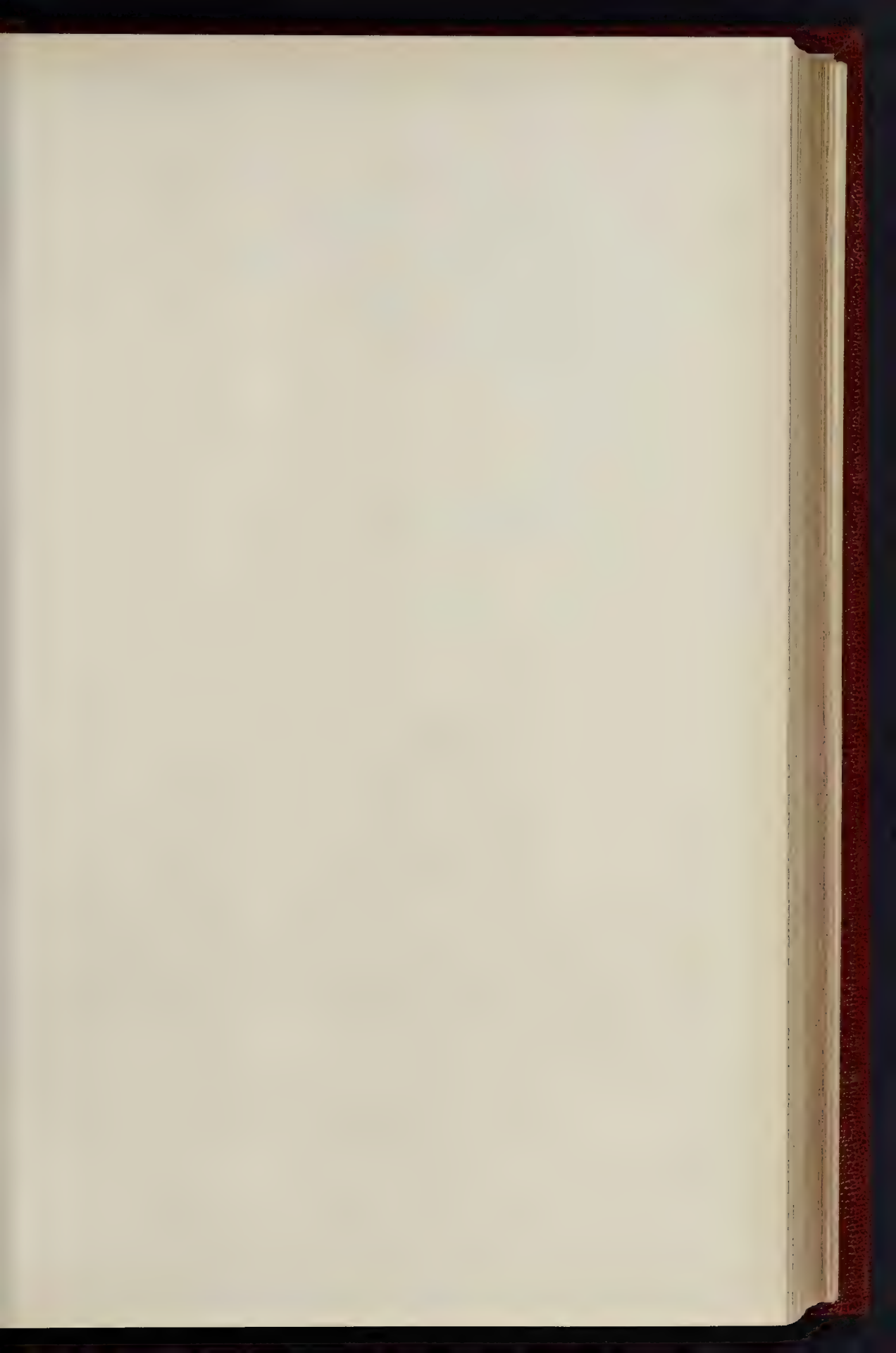
THE LATE GEO. EDMUND STREET, R.A.
ARCHITECT.

DESIGN FOR THE PROPOSED "WALSHAM MEMORIAL" TOWER

SAM^L MUSGRAVE, A.R.B.A.
ARCHITECT, HULL

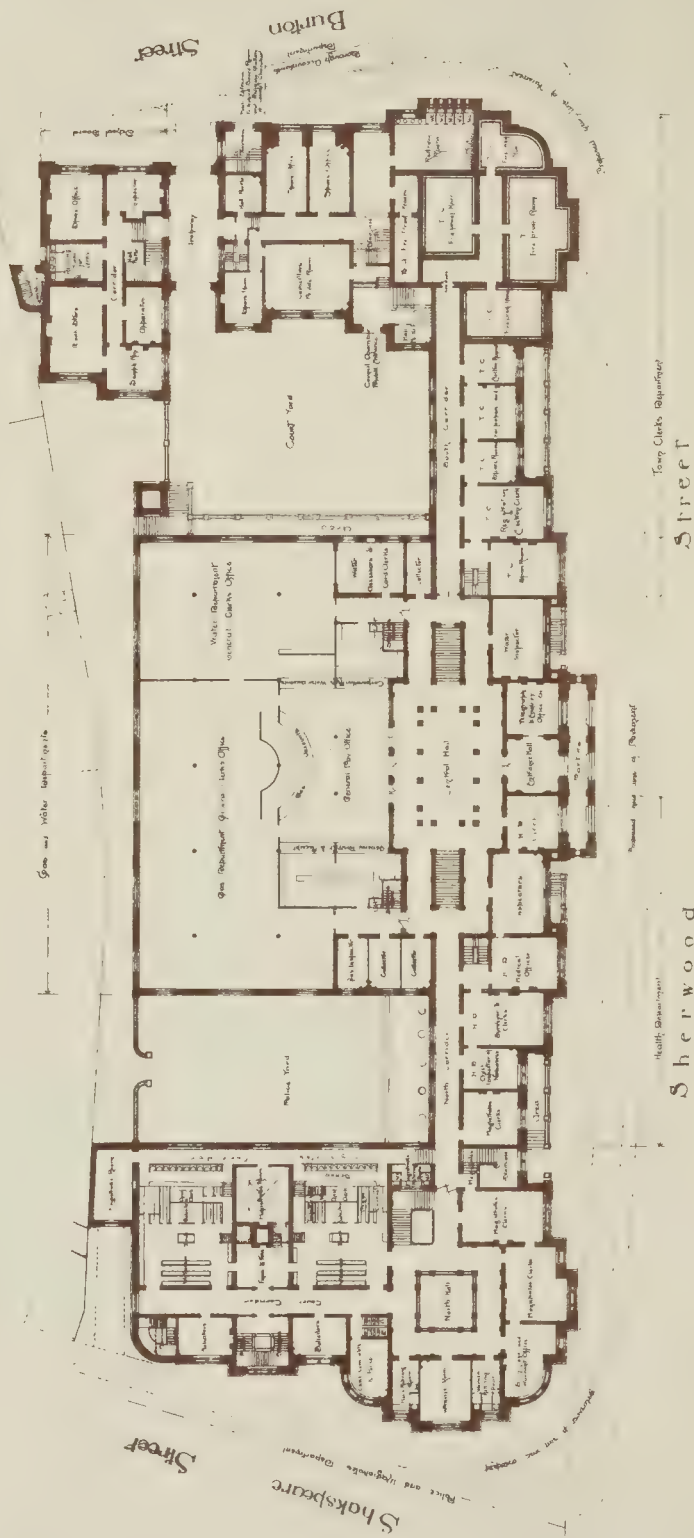
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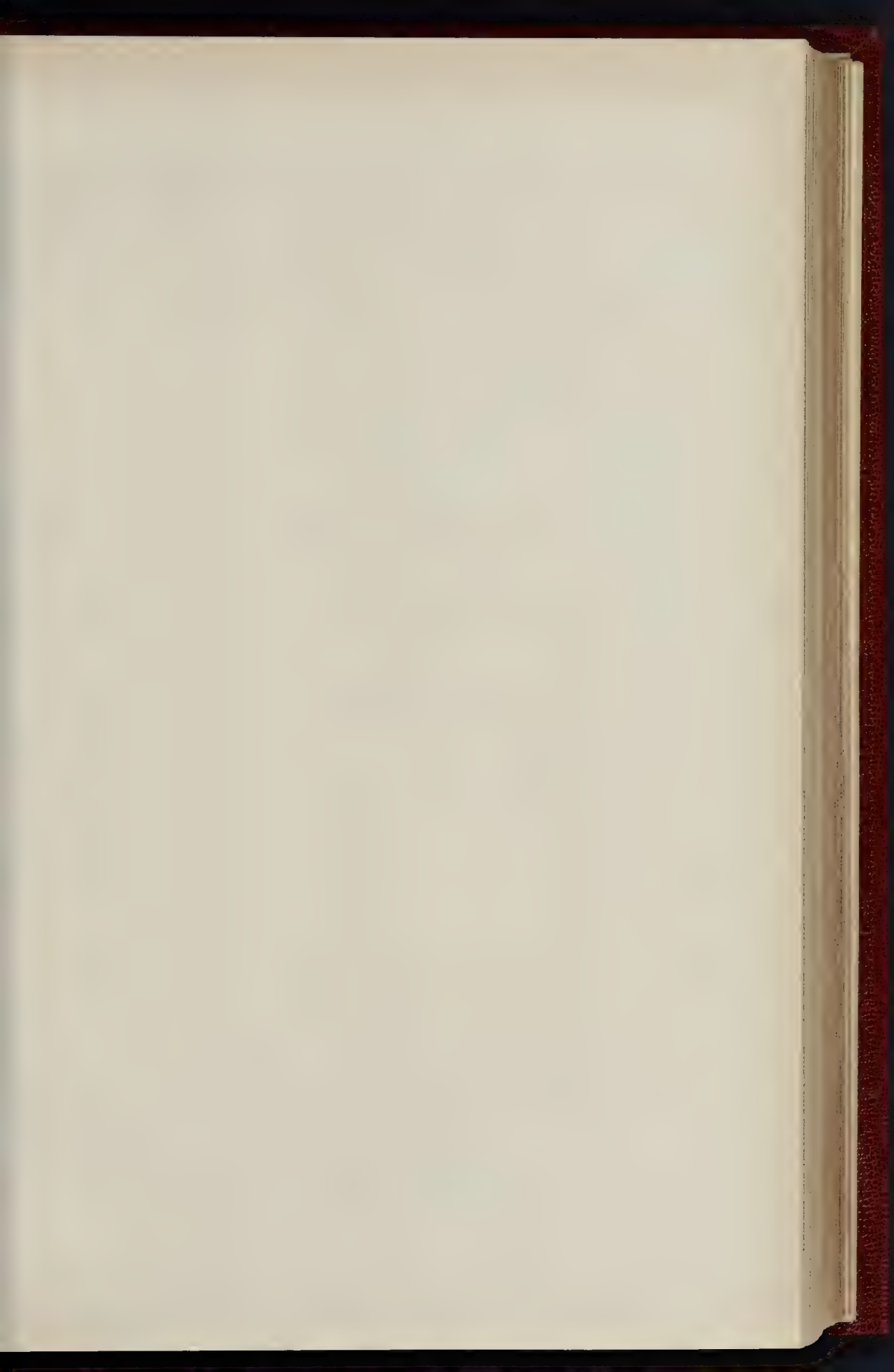
M. Green St. London, W.C.



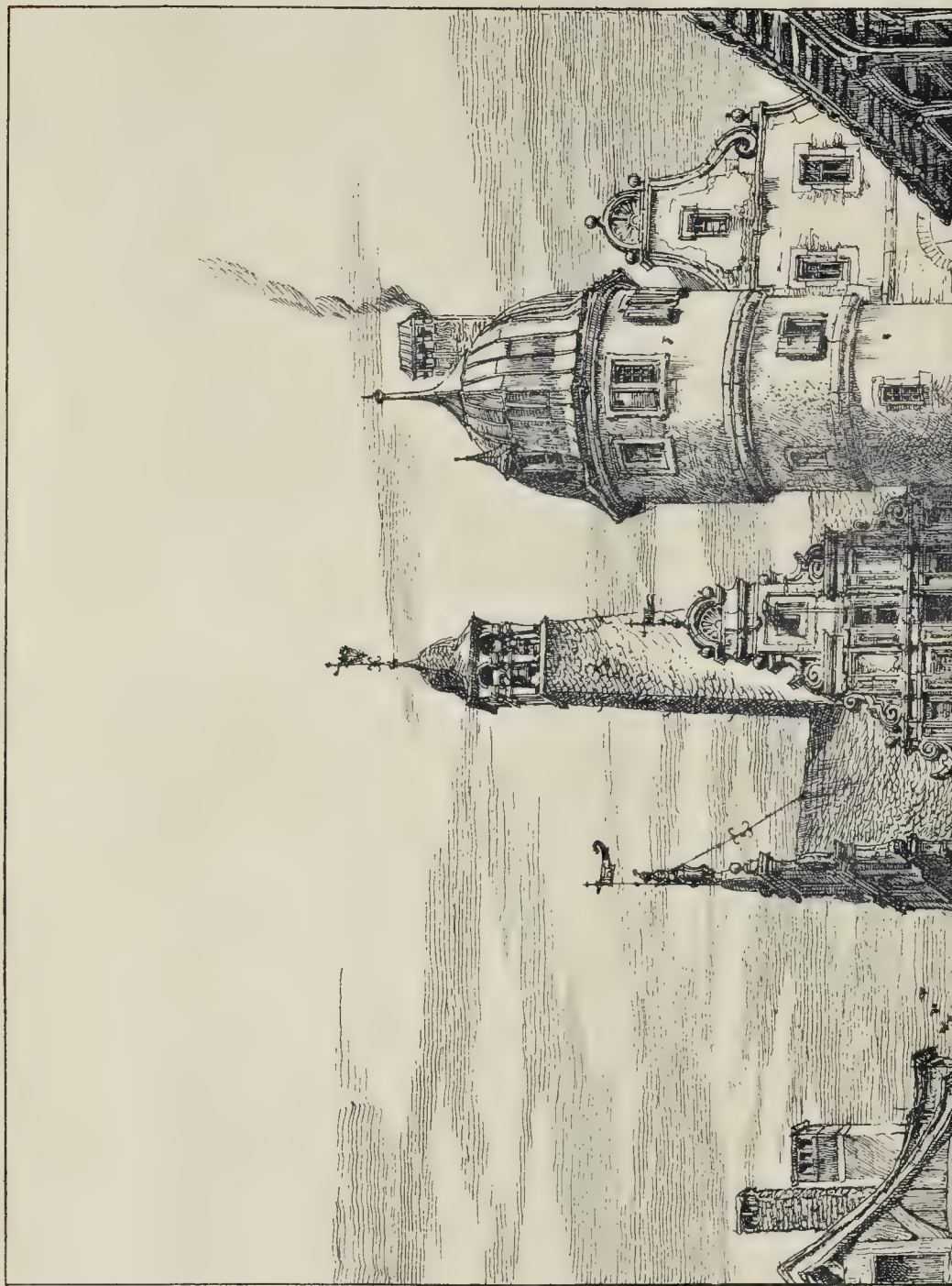
NOTTINGHAM MUNICIPAL BUILDINGS.

GROUND FLOOR





THE BUILDER, JANUARY 19, 1884.



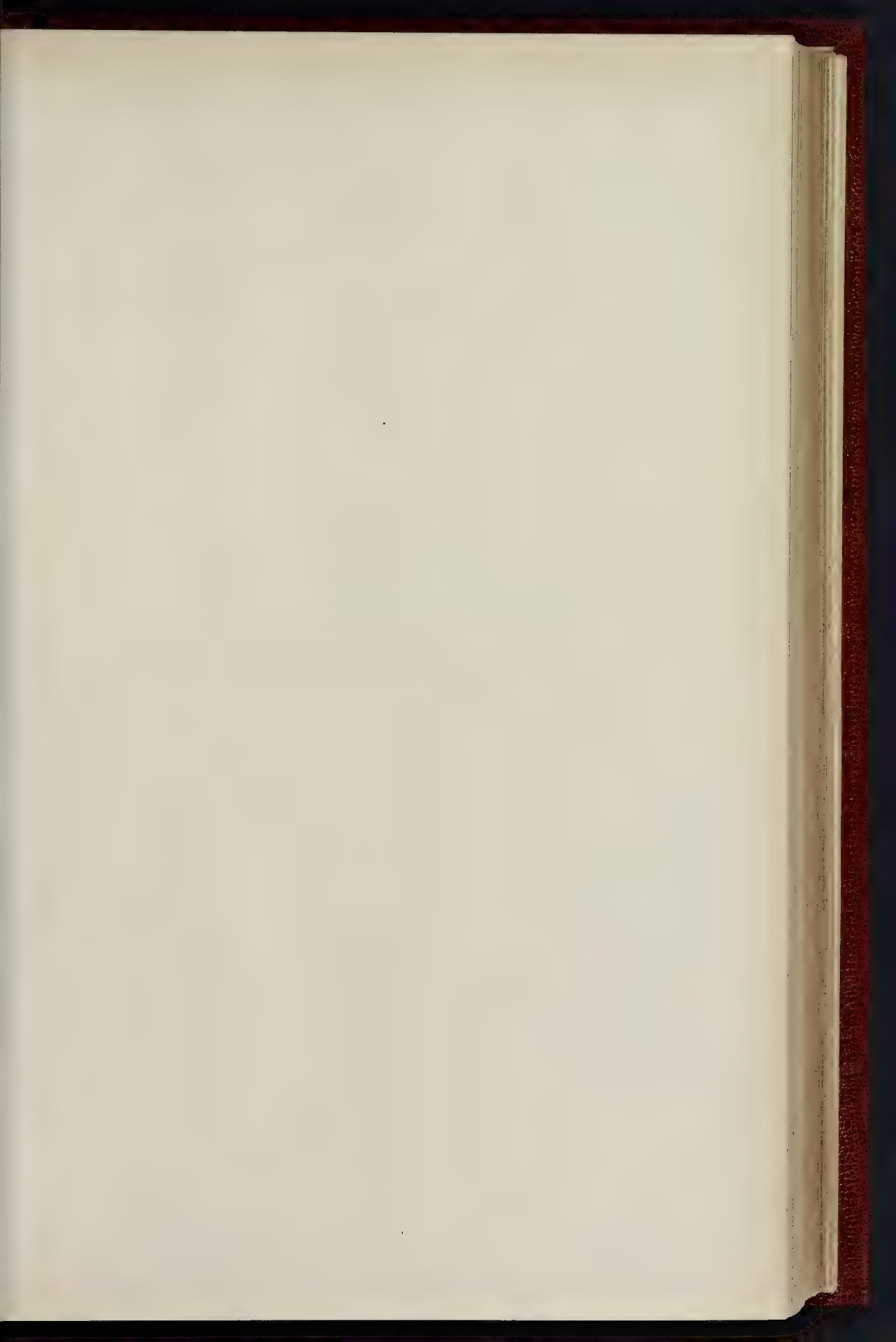


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H.W. Brewer, 1883.

THE RATHHAUS, MARKT-BREIT, BAVARIA.

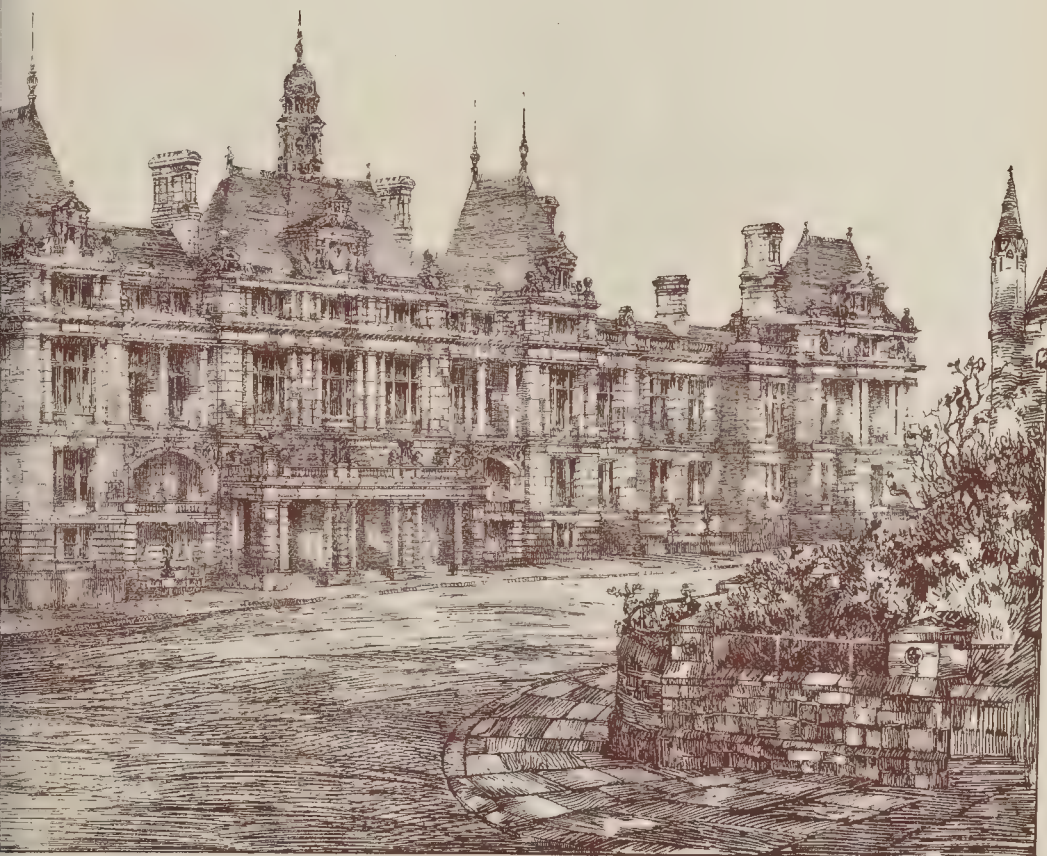
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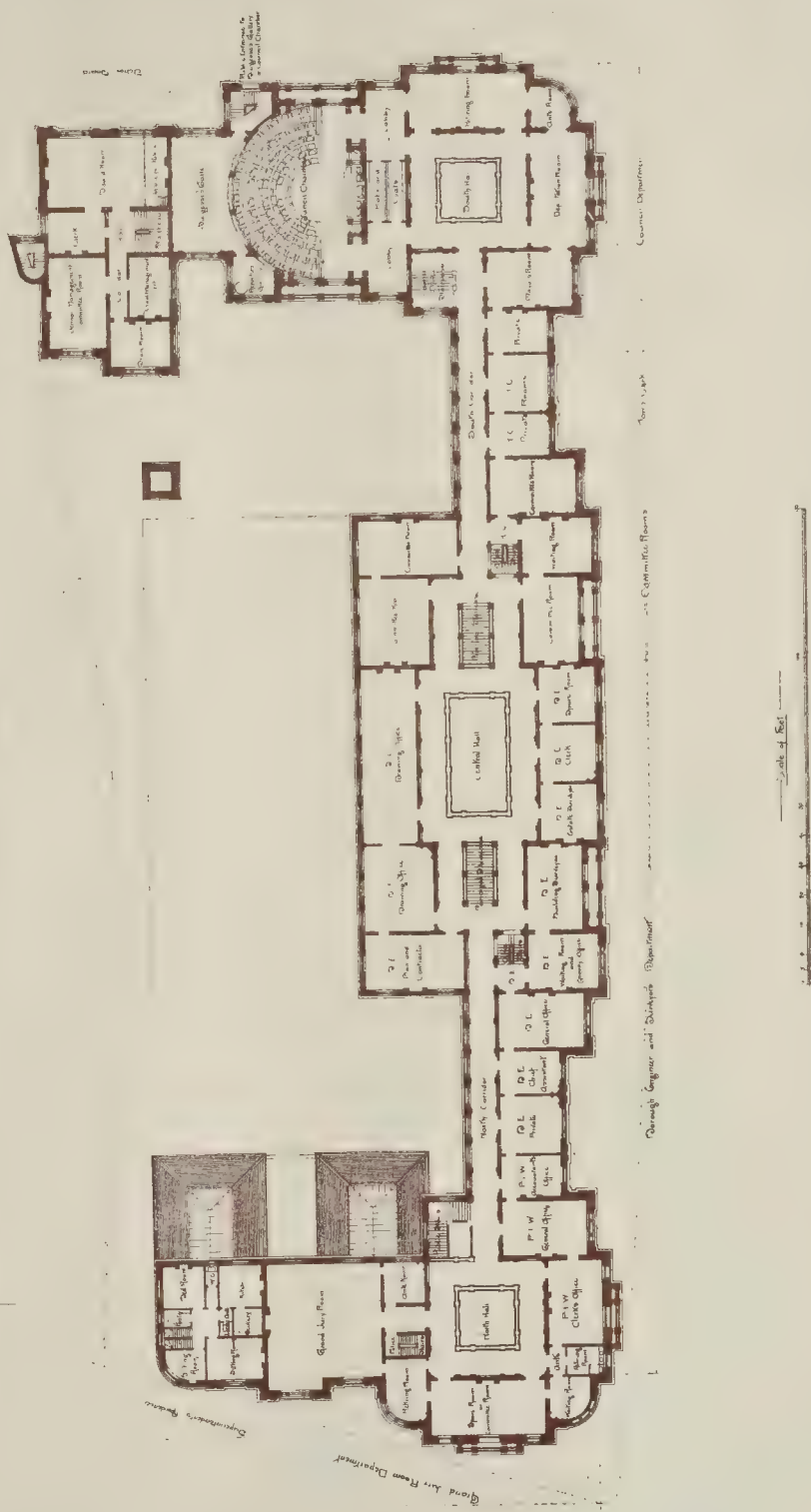
NOTTINGHAM MUNICIPAL BUILDINGS.
Accepted Design. Messrs. Verity & Hunt Architects.

W. H. & Co. Printers & Publishers



3 Castle St House 1.1 London E.C.

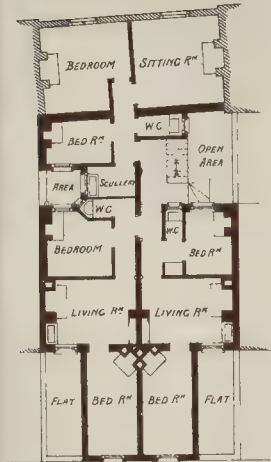
FIRST FLOOR.



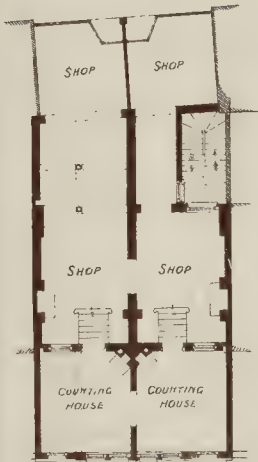
*** New Premises in Uxbridge St Notting Hill ***

MR. ARTHUR YOUNG, ARCHITECT.

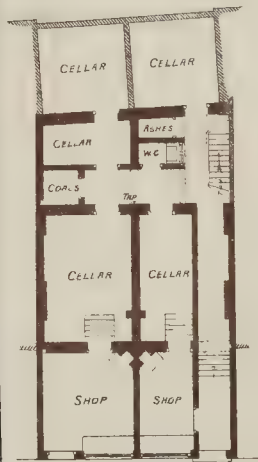
SCALE OF FEET



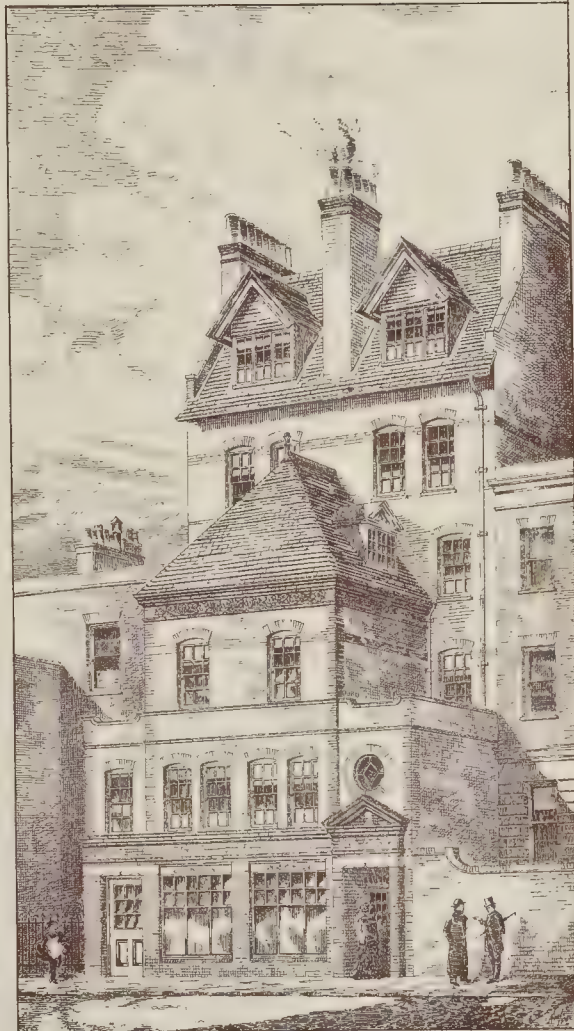
FIRST FLOOR



GROUND FLOOR



BASEMENT



NOTTINGHAM MUNICIPAL BUILDINGS.

WE publish this week a perspective view of the accepted design for this important building, by Messrs. Verity & Hunt. As will be remembered, the design was selected from among those of seven architects who were invited to compete finally, having been selected from the sketch designs submitted in a preliminary competition. Eight architects were invited to send in, but only seven accepted the invitation. Mr. Waterhouse was the professional assessor, and he bracketed the design of Messrs. Verity & Hunt with that of Mr. Oldham, the former being recommended for plan, the latter for picturesque quality of design. The Corporation of Nottingham rightly considered that plan was the most important element, and also expressed the opinion that the design of Messrs. Verity & Hunt was best adapted for the purposes of the proposed building; an opinion from which we are not disposed to dissent, though estimating highly some of the original and picturesque treatment in Mr. Oldham's perspective view. These two designs being bracketed and the premiums divided, the third premium was awarded to the design by Mr. Corson, which also we propose to illustrate shortly.

The estimated cost of the building is £1,257, with a probable further outlay of about 20,000, for lighting and furnishing.

THE RATHHAUS, MARKT-BREIT.

WE have frequently had occasion to allude to the peculiarity of the sites selected for churches and public buildings by the Mediæval architects of Germany. They seem never to have been daunted by any difficulty, least of all by want of space. If there was no room for the proposed building upon the ground, they built it over the water or up in the air. The Rathaus at Markt-breit is a remarkable case in point. As this busy little commercial town rose in importance and size, a new and larger Rathaus or townhall was required, but as the town was already closely built with rather narrow streets and high houses, no site was available for the purpose. The modern idea of clearing a site by pulling down a number of houses and turning the inhabitants adrift was not to the taste of Mediæval corporations, and, of course, such an important edifice as the Rathaus could not possibly be erected outside the walls of the town. Now the way the difficulty was met was most ingenious. The building was constructed partly over a river, which runs through the town, and partly over the principal street, and thus a townhall of sufficient size and importance was obtained without the sacrifice of existing buildings, and absolutely without any site at all!

The Rathaus at Markt-breit dates chiefly from the earlier part of the sixteenth century, but great alterations were made at the commencement of the seventeenth century, to which date the elaborate gables may be ascribed. H. W. B.

NEW PREMISES, UXBRIDGE-STREET, NOTTING-HILL.

THE view and plans which we give of these simple and unpretending buildings will speak for themselves. Nothing could well be more simple, but they have the merit of being suitable to their purpose and being substantially and solidly built, and without any of those gimcracks of wooden cornices and such adornments which characterise the average shop-front architecture. The architect is Mr. Arthur Young.

London and Middlesex Archaeological Society.—At a meeting of this Society at 4, St. Martin's-place, Trafalgar-square, last Monday evening (14th inst.), a paper was read by Prof. John W. Hales, M.A., "On the Barrow at Hampstead Heath, with Notes on Traitor's Hill"; after which another paper by Mr. John Sachs was read "On the Foundations of Ancient Buildings recently discovered in Chancery-lane." The lower foundations formed portion of the old Temple. Mr. Alfred White, F.S.A., remarked that at the removal of Middle-row some years back considerable remains of foundations were discovered, and were quite understood to belong to the old Temple.

FOUNTAINS ABBEY.*

IN addition to the extreme simplicity of form in the plan and elevations of the church, we find that the interior decoration of the building was equally simple. It so happens at Fountains Abbey that, notwithstanding more than three hundred years of exposure to all the inclemency of a Yorkshire climate, much of the mural decoration of the church still exists: it is of the plainest description,—merely red joint lines on a white ground. With these red lines the whole surface of the walls, piers, and arches seems to have been covered, and it is interesting to note that some of this jointing belongs evidently to the twelfth century, while some of it must have been done quite 300 years later, showing that the ancient rule in the matter of painting did exercise considerable repression even to the last days of the order. In the whole Abbey of Fountains I only discovered the remains of one small fresco. It is on one of the piers on the south side of the nave, and probably formed part of an altar-piece. It appears to have been executed in monochrome.

At the west end of Cistercian churches there is often found a portico, or narthex, extending along the whole length of the western façade. Its primary use is doubtful, but it was used at Fountains, and I do not doubt elsewhere also, as a place of sepulture; I should think very likely for noble personages of the laity wishing to be buried near the church, within which the strict laws of the order would not admit their bodies.

It may be well to mention here, as a termination to my remarks upon the church, that the Cistercians were among the first to make use of the pointed arch, and it is particularly worthy of note that they used it first, not for the more decorative features, such as windows, doors, and arcades, but, without exception, for the main arches of construction, such as arches of the nave arcade, the great arches at the crossing, and for the transverse ribs of vaulting. This seems to me to be a conclusive argument against the theory that the pointed arch was discovered by the chance intersection of two semicircular arches in Norman arcading. I believe, on the contrary, it was adopted on constructional motives,† from the recognition of the fact that a semicircular arch without a keystone is inclined to be weak, while with a keystone it necessitates a different mode of treatment from what our eleventh and twelfth century ancestors were willing to adopt.

I must now say a few words about the other main conventual buildings at Fountains Abbey, all of which are in a wonderful state of preservation. On leaving the church by the cloister door and walking south, we first come to what now looks like a vaulted passage. This was originally divided into two separate apartments, of which the eastern one was the sacristy, with a private entrance into the south transept of the church; and the western one seems likely to have been a cell in which the monks may, perhaps, have expiated their minor offences. In after years it came to be used as a charnel-house, and no less than 500 nearly perfect skeletons were found carefully packed in this small space when the ruins were first put in order, some thirty years ago. Next comes the chapter-house, which, like most chapter-houses of this order, is a long parallelogram, divided into three aisles by two rows of pillars running from east to west. This was a very elaborate piece of architecture; it was vaulted throughout with rich stone vaulting, supported on corbels against the walls and the columns before named. These latter, with their caps and bases, were of polished marble. The chapter-house was entered by three great archways leading directly into it from the cloister, and as these archways never had doors, and the cloister was not glazed, the chapter-house was virtually open to the outer air. The memorial slabs of several of the abbots remain in the chapter-house, and also the bases of three tiers of stone seats running round the walls. As the remains of these seats are interrupted at the east end of the centre aisle, I am inclined to think that the abbot's chair stood in this position, and was of wood.

Next to the chapter-house is a richly-vaulted passage, which leads directly to the abbot's house and various other buildings to the south-east of the central block, of which I have not time to speak.

* From a paper by Mr. J. Arthur Reere, read at the Architectural Association. See p. 75, ante.
† As was fully shown by Mr. Sharpe in his splendidly illustrated "Parallels," published *Consule Plancœ*.—Ed.

Then follows the frater, a long, low, and inexpressibly dismal building, running north and south. The northernmost bay, which overlaps the cloister, was divided off from the rest of the apartment, and had a doorway at each end, one communicating with the cloister court, and the other with the base court. The part thus cut off from the monks' day-room may perhaps have been a locutorium. The wall which originally separated this apartment from the frater is now demolished, but it is plain that it once existed. At Fountains this locutorium was evidently an after-thought; but it generally forms one of the separate rooms in a Cistercian abbey. Sometimes this and the passage mentioned above are transposed, but traces of both are almost always found. The frater itself is a low, vaulted room, divided into two aisles by a row of columns down the centre. It was lighted, or, rather, its extreme gloominess was made manifest, by two windows at the south end. There was no other natural light, but possibly lamps were kept burning at the northern end of the apartment. Above this day-room was the monks' dormitory which was reached by a flight of stairs, still existing, between the frater and the kitchen. From this dormitory there was a passage leading directly into the south transept of the church, which enabled the monks to attend the midnight services with greater ease. The scriptorium also was reached by this passage. It was situated above the four eastern bays of the chapter-house, and must have been a very spacious apartment; but now only the three outer walls remain, and these are in a very ruinous condition. The height of the roof overall of these buildings is given by the line cut in the face of the south transept to receive the flashing. Strangely enough, although the chapter-house and frater are only two or three years later in date than the nave and transept of the church, and must have formed part of the original design, this roof-line was allowed to cut, in the most careless manner, across the windows of the transept.

We now reach the buildings on the south side of the cloister court, of which the kitchen comes first. This is a very fine, lofty room, oblong in shape, vaulted, and divided into two bays each way, with a massive pier supporting the ribs in the centre. In the eastern wall there are two great fire-places, the openings occupying the whole width of one bay each; they are more than 16 ft. wide, by 6 ft. 6 in. high, and are square-headed, the lintels being formed by flat arches composed of goggled stones, 4 ft. 9 in. deep. The kitchen was lighted by two large windows in the south wall, and there was also a doorway in this wall giving access to certain buildings lying between the frater and refectory, which were, probably, sculleries, fuel houses, &c. In the west wall of the kitchen are two openings, cut after the completion of the building, to form hatchways into the refectory; in the north wall there is only the doorway leading into the cloister court.

In the centre of the south wall of the cloister stands the noblest of all the conventual buildings, namely, the refectory. This must have been a superb room when in a perfect state; it is 109 ft. long by 46 ft. wide, and is divided into two aisles by a row of marble columns down the centre. Unlike all the other buildings in the Abbey, this room was not vaulted; it seems to have had two parallel wooden ceilings, arched in form and very lofty. The seats and tables were arranged round the east, south, and west walls of the building, there being, apparently, a somewhat higher table along the south end than elsewhere. The seats were of stone and the tables had stone uprights, but, no doubt, the flat part of the table was of wood. The remains of these stone fittings exist in a sufficiently perfect condition to enable one to restore the interior of the refectory with a very considerable amount of accuracy. The pulpit, which, I believe, is almost invariably found in the refectory of a large abbey, is clearly traceable at Fountains, on the west side of the building; the doorway and flight of stairs leading to it in the thickness of the wall are quite perfect, and just inside the doorway is the locker in which the books were kept. Quite at the north end of the west wall there is a doorway with curved sides, leading into the battery. This is very interesting as showing that here stood a turntable from which, no doubt, each monk took his rations as he entered the refectory.

The buttery is the last building on the south side of the cloister, and of this there is little to be said beyond what I have just mentioned concerning the turntable. Owing to various alterations which have been made in it from time to time it is a most puzzling ruin to decipher, and one which hardly repays one for the trouble it gives. The only point of real interest about it which remains to be noted is that part of a stone sink exists in it to which a considerable length of lead-piping is still attached. I must not omit to mention that there are the remains of the lavatory along this south wall of the cloister, on each side of the refectory doorway; its form is a long trough, one half of the whole length of which still remains. It is evident by the deposit of lime still adhering to it that this trough was always kept full of water. The holes for the serving-pipes and waste-pipes are in existence. There is a ledge running all along behind the trough, upon which, in all probability, small brass reservoirs with taps were placed, for our forefathers were in the habit of washing their hands over a basin rather than in it.

The last building to be mentioned is the "Domus Conversorum." I think there can be very little doubt that Mr. Sharpe was right when he came to the conclusion that the long low building which is generally found on the western side of the cloister-court in Cistercian abbeys was the house inhabited by the *conversi*.^{*} In design, it follows very much the lines of the frater; that is to say, it consists of a long low vaulted day-room below, with a large dormitory above; but as the number of *conversi* was very much greater than that of the monks, their house is very much larger. At Fountains it is no less than 300 ft. long by 41 ft. wide; it was probably originally divided into at least two parts, although there is now no sign of a partition; at all events, the southern end, from the number and size of its windows, has evidently been used as a workshop, while the northern end was merely a kind of lobby in which those *conversi* mustered who went out of the Abbey to work in the fields, stables, &c. It is thought by some people, too, that the eastern aisle of this northern part was used as a store-house. For my part, I am inclined to think that, considering the immense number of *conversi*, the whole of the space is likely to have been wanted to accommodate them during the winter evenings after work was over. There are four large doorways in the western wall of this northern portion of the day-room, and two small ones, evidently to allow the crowd of *conversi* to get rapidly out of the house on leaving the church after attending the early service, at which they were all bound to be present. At the north end of the western aisle there is a large door leading directly into the south aisle of the church. On the western side of this great building, and about in the centre of it, there is a little room with a fire-place in it, over which are the steps leading to the dormitory. This room was inhabited no doubt by the Magister Conversorum, who was responsible for the good behaviour of this large body of servants,—for such they might almost be called. There is nothing much worthy of note in the dormitory itself; it is as large as the day-room below, and was lighted by narrow round-headed windows, throughout its length, on each side; a flight of steps at the northern end leads down to the south aisle of the church, showing that although the *conversi* did not attend the midnight services they went straight to the church from their beds before leaving the Abbey on their various daily duties. The dormitory was not vaulted; there were therefore no columns down the centre; it is even probable that there were no partitions; the long unbroken lines of sleeping *conversi* must therefore have presented a most strange, even weird, appearance to the eye of any one who could have seen them; they slept in their ordinary clothing without extra covering.

Of the other buildings connected with the Abbey besides those of which I have now given you a rough sketch, the chief are the abbot's house, the *hospitium*, with the infirmary, the gatehouse, and the mill, all of which still exist in a more or less perfect condition at Fountains; the mill is even yet in constant use.

In addition to these there are also many mounds and portions of decaying walls in the

neighbourhood of the Abbey which no doubt mark the positions of stables, granaries, &c., the reservoirs and stew ponds are also in existence on the side of the hill to the south of the Abbey, and it is clear besides that the subject of drainage received their careful attention; the *necessaria* attached to the *domus conversorum* being still in a remarkable state of preservation, while a similar building for the use of the monks is clearly traceable to the east of the frater; they are both built over the river, as were the other small garb-robes attached to the *hospitium* and abbot's house; but although all of these remains are very instructive and picturesque on the spot, I fancy it would be even more difficult to make them interesting at a distance than those parts of the Abbey which I have touched upon to-night.

In the course of the discussion, the chairman (Mr. Cole A. Adams, President) said that Fountains Abbey and other buildings of the Cistercian order were well worth the attentive study of young architects, for with comparatively few mouldings, and the severest rules as to decoration generally, the Cistercian architects succeeded in producing buildings of the grandest character.

Mr. F. T. Baggallay said he had been struck by what Mr. Reeve had said as to the influence of the lives led by the builders upon the buildings which they erected. If there were anything in that, it was to be regretted, if only for the sake of our architecture, that the lives of the people of the present day were so different from the simple, pure lives led by the Cistercian monks. The luxury of the present day was the cause of luxury and exuberant ornament in our buildings, and to it the decay of the Gothic revival was no doubt partially due.

Mr. Millard observed that Mr. Reeve had measured the whole of the buildings at Fountains in the most exact and minute manner, and he was, probably, the only man who could have given the Association so interesting a paper on Fountains Abbey.

Mr. A. B. Fite, Mr. Leonard Stokes, and Mr. Hampden W. Pratt each said a few words, Mr. Pratt asking whether the remains of the buildings were being kept up as "a ruin," or whether they were allowed to go still further to decay. He also asked whether it was contemplated to restore any of the buildings to their original condition. Mr. Reeve's conjectural restorations were very interesting, and were, no doubt, well warranted by facts within Mr. Reeve's knowledge.

A vote of thanks having been put and carried,

Mr. Reeve, in briefly replying, said he had been employed by Lord Ripon, the owner of the Abbey, to make the measured drawings, and his instructions were to make them as complete as possible, and it had, therefore, been his duty as well as his pleasure to do so. He could not say whether the ruin was being maintained or "kept up" now, but he presumed so. The late Mr. Burges was appointed by Lord Ripon as the architect charged with the preservation of the ruin, but he (Mr. Reeve) did not know whether any one had been appointed to fill Mr. Burges's place.

The Moisture of the Atmosphere.—The fifth of the course of lectures on "Meteorology," by Mr. W. Marriott, F.R.M.S., was delivered on the evening of January 10, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Charles Horsley, past-president, in the chair. The subject under consideration in this lecture was the moisture of the atmosphere. The air is a mixture of certain gases, the most important being oxygen, nitrogen, and aqueous vapour. These may be resolved into two classes, viz., an atmosphere of dry air, embracing oxygen and nitrogen, and an atmosphere of aqueous vapour. The dry air is always a gas, and its quantity is constant; but the aqueous vapour does not always remain in the gaseous state, and its quantity is ever varying through the processes of evaporation and condensation. The lecturer having described the methods employed for determining the amount of evaporation, and also the various hygrometers for ascertaining the amount of moisture in the air, and the deductions to be made from them, explained how dew, hoarfrost, mist, and fog are formed. The lecturer concluded by giving a description, with illustrations, of the various forms of cloud.

THE QUARTERLY REVIEW ON THE DWELLINGS OF THE POOR.

THE current number of the *Quarterly Review* devotes two dozen pages to a discussion of the all-absorbing question of the provision of decent homes for the poorer classes, and a reformation of the influences by which they are surrounded, and it is not difficult to see in the trenchant style, the caustic hits at political opponents, and the abundance of epigram with which the essay is enlivened, the traces of a well-known hand. In substance the article in question only echoes what we have ourselves proclaimed from the house-tops these twenty years. In manner it is disfigured by a polemical cast. Nothing will be gained by using so serious a subject as a fulcrum for discrediting a political opponent. And it will be unfortunate if the misery of the poor, and the squalor of their dwellings, should be dragged into the political arena, and become the battle-field of contending parties in the State. All are agreed as to the evils which have to be remedied, and agreed, too, that it is incumbent on some one to do something on a large scale to relieve the kingdom from the presence of an ugly blot. But what it were best to do is a matter upon which it is difficult to agree, and it is not to be hoped that a working solution of the problem will be arrived at by political philanthropists or philanthropic politicians, while one side greet the recommendations of the other with a cry of "socialism" and "confiscation," and while rival schemes are met with thinly-veiled accusations of extortion and robbery. There is a danger of the work remaining undone for want of knowing who should do it, and of narrowing the question of housing the poor to the respective duties of the State, and the land-owner. It is needless to say that in spite of evident and strenuous political bias, the writer in the *Quarterly* brings to his consideration of the question a large amount of carefully collected (and selected) knowledge, and a pre-conceived determination that, whoever is to blame for the shocking state of some quarters of our great towns, the freeholders are blameless. "It is untrue," he says, "that the landlords as a class are making or have been making a profit out of the wretchedness and overcrowding which exist on their property. By far the greater number of houses in the metropolis are let and sublet,—sometimes through five or six hands,—the landlord getting a moderate ground-rent settled probably long ago." And so on. But here the writer must have known that he was feigning with the real charge against many of the landlord class. What happens when the old lease which was based upon the old valuation falls in? Does the landlord as a rule set about readjusting his revenues on the principle of limiting the occupation of the property to a decent and healthy basis, and assessing the new rent for his property on the increased value of it if legitimately used? The gravamen of the charge against him is that he uses the necessities of the poor to swell his income, and shelters himself behind leases as a means of disowning the attaching responsibility and odium. This is human nature and not a weakness chargeable upon any one class in particular, and while human nature remains unchanged this weakness will probably show itself, as it has always hitherto shown itself, until the end of the world. The State must check the growing evil, and, to check it, two things are requisite,—a vigilant unsleeping scrutiny, and power to arrest the incipient mischief.

One of the greatest hindrances to the improvement of the houses of the poor is the question of compensation to those interested in the property. However the owners may neglect their duties, the law secures them certain rights, and they cannot be dispossessed without fair compensation. What is a fair compensation to the owner of a house which is so deficient in all the qualities which should distinguish a house that the State is obliged to step in and say, "This must come down"? The statute says the compensation is to be based on the "fair market value" of the property. The market value of anything, say the owners, is what it will fetch, and the competition for these wretched dens, so miserably inadequate in number, loathsome as they are, is so keen that fancy rents are paid for them by their half-famished occupants. Shall the value of these be assessed on the rental, or how? The arbitrators under Cross's Acts, as they are called,

^{*} This has been called in question since, not without reasons assigned. See some papers on "Benedictine and Cistercian Architecture," in the *Portfolio* last year.—Ed.

have laid down these salutary canons, which have received the approval of a special Parliamentary committee:—First, "A house too bad for repair [not an exacting definition] is a plot of land valued as a house at all; but as a plot of land with so many cart-loads of rubbish upon it." Secondly, "In valuing such a plot of land, regard is to be had to its evil surroundings."

When, however, the initial difficulties have been overcome and the site has been cleared the troubles are only commencing. Too many poor people, who were callous to the miseries with which their lives were visited, have been dispossessed only to make the congestion in the remaining tenements more severe, and no substitutes for the demolished dwellings have been erected. There are many suggestions for meeting the difficulty, but none of them are quite equal to the emergency. Lord Salisbury would have the State become a mortgagee for the purpose. Mr. Torrens would apply the Post-office Savings Bank balances to the work, lending the necessary sums to the Vestries at 2½ per cent. interest, and taking the rates as security. Attempts to make the erection of the necessary dwellings, with proper accommodation and a fair rental, pay, have failed hitherto. The money question is at the bottom of the whole, and the money question is an open one. Private speculation is not likely to undertake the work at a loss. The scope is beyond the efforts of philanthropy, and all are agreed that, with our present views on social ethics, the work is not for the State.

One thing the State can do. It can decree that certain conditions inimical to the public health and safety shall not be allowed to exist unpunished and increase unchecked. To this end the several Acts in force are theoretically competent. But they fail for want of being enforced. The law, if not perfect, is adequate to a reasonable and satisfactory amelioration of the dwellings of the poor, and the first necessity is such a remodelling of the staff charged with the application of the existing law as shall prevent its falling inoperative, as it is for the most part at the present moment. As a commencement, the number of inspectors of nuisances should be multiplied by ten, and all the officers charged with the execution of the Acts for the better securing of the public health should be the servants of the Crown, and not of vestries and similar bodies. On this point we cannot do better than quote from the article under notice:—

"It is frequently said that the reason why the vestries do not get rid of unhealthy dwellings is that many of the vestrymen are holders of small house property, and that selfish private interests thus prevent the discharge of public duties. In the absence of direct evidence it is scarcely fair to fasten upon a whole body of men who perform important public functions without fee or reward a stigma which is only partially deserved. People seem to forget that Acts of Parliament do not administer themselves and the sanitary machinery of London is standing comparatively idle for lack of men to work it. There are 5,000 tenement houses in Whitechapel, and only two sanitary inspectors. If these officials devoted their whole time to this work alone, they could, perhaps, visit each tenement once in three months,—an inspection which would be ludicrously inadequate. Weekly inspection at least is necessary, and this duty would require twenty-six inspectors in place of two."

The reviewer is perhaps a little inconsistent in saying that "the actual condition of London is absolutely unknown," but that "things are not so bad as they were forty years ago." We are of opinion that many evils which then existed have been removed, and many which remain have been lessened in extent and in intensity. And in this fact we see the best hope for the future. Many things are conspiring towards the ultimate reduction, if not extinction, of the evil we deplore. In the first place, the danger of the neglect of conformity with the laws of health is better understood and appreciated; and, in the next place, our national education scheme is bringing this fact home to millions whom it could in the old days never have reached. An improved education will induce, in the very poor, improved views of life, and these will lead to a higher standard of home comfort. The temperance movement in its many forms is reaching vast masses of the people, and is working on the side of the sanitarian. The most hopeless part of the present posture of affairs is the apathy of the chief sufferers. But this apathy will disappear under the growth of knowledge and the self-respect which temperance brings.

Miss Octavia Hill says that the desired reform will not pay; that no reform pays in a narrow sense; and that the dulled conscience of the community, which allowed the evils to grow, must now make amends by redressing them at the public cost. The Reviewer evidently endorses this theory; but the public may not like to buy off the "owners" who have been reaping a golden harvest from the degradation of their fellow creatures, and then assume the whole charge of rectifying the wrong. Such a course would hardly be equitable, any more than it would be just to mulct the unfortunate landowner for the iniquity of his lessee. The Reviewer's advice that "few edicts should be promulgated, but that those few should be well observed," strikes at the root of the matter so far as the amendment of the present existing tenements is concerned. How to face the great question of substituting others more suitable he cannot see,—except by advising the Government, as banker of the public savings, to lend those savings to local bodies to lay out on the desired improvements to be recouped from the pockets of the savers. Amongst other things he would amend the Metropolitan Building Act. But first he should understand that of which he complains. He says truly that it is therein enacted that an air space of 100 square feet is all that is prescribed per dwelling, however large that dwelling may be; but he says what is not the fact when he avers that so soon as the district surveyor's certificate is given that 100 ft. may be built over, and is so built over, constantly. Let him consult Clause IX. of the same Act, and admit over-haste in his strictures of a useful though imperfect and much-abused statute.

NORTHERN ARCHITECTURAL ASSOCIATION.

We extract the following passages from a very practical address delivered by Mr. F. W. Rich, the President of the Northern Architectural Association, whose head-quarters are at Newcastle-on-Tyne:—

One of the fruitful causes of the so-called unpopularity of architects arises in the fact of their frequently not being allowed to carry out their designs in their integrity. Architects are often liable to fall in, in a sort of friendly way, with the notions of their clients, be they governments, corporations, or private individuals, and have often afterwards to repent it. I need hardly remind my friends that an important part of the duty of an architect is to see and be able to certify that the work carried out under his supervision has been done in a satisfactory and workmanlike manner (words we often hear), and upon this arises an element of so-called unpopularity, which is attributable in a very great measure to the very medium degree of excellence exhibited by many of the workmen of the building trades, and the consequent want of solidarity between themselves and architects.

That there are good workmen in the building trades no one will deny, but they are in a very small minority.

A general would be nowhere with his battle, were it not for the good quality of his soldiers. The workmen are to the architect what the soldiers are to the general. Let an architect plan ever so cunningly, his work may be all swamped in its execution, and for this he is held responsible.

But from what source do we draw our workmen? Will it be believed that, practically, there is scarcely an apprentice in the majority of the building trades in Newcastle. From whence, then, do we draw our supplies? I am afraid we get the majority of our men from the "jerry" source, or, in other words, the speculating builders; and a few are drafted from the country. Time was, and not very long ago either, when every workman had to serve seven years' apprenticeship, and could produce his indentures to that effect. What have we now? A youth in going to business can scarcely get into the best shops (for I have discussed this question frequently with some of the principal contractors in this city, and I got one general answer,—"That apprentices are more bother than they are worth." A more deplorable answer can hardly be imagined). So what does the youth do? He gets employment with the jerry builder, passes two or three years in this slipshod school, and then launches himself on the world as a full-blown journeyman, often before he is eighteen or nineteen years of age.

No wonder that with such a training we should get such indifferent work, for which architects too often get the blame. If the workman is not fitted to do good work, no amount of supervision on the part of an architect can alter him. It can only be done by a thorough training in youth.

While speaking of apprentices in the building trades, we must not forget our own, or pupils as we call them, and we shall find a state of things which is not altogether satisfactory, but arising from different causes to those of the building trades, and if this association can do anything to better this state of things, it would deserve the thanks of the whole profession.

I have no doubt every gentleman present knows the difficulty of getting thoroughly good and reliable assistants; and no wonder. A youth under present conditions remains at school until he is about eighteen years of age, and then comes into an architect's office to try to master in three years a somewhat lengthy programme. As I said before, seven years used to be considered a fair time for an apprentice in the building trades to master his trade. Now we generally consider there are roughly seven trades in what we call the building trades, yet the architectural pupil very frequently endeavours to master in about three years, not only the fine art and theoretical portion of his profession, but also the principles of the whole of the building trades which will enable him to understand his work. I do not mean to say that it would require the pupil seven times seven years to master all this fine art, theoretical, and practical work (although, goodness knows, it takes a long time); but I do mean to say that with the facilities available in provincial towns a youth has not a chance, when in an office, of becoming proficient as an architectural draughtsman in the time allotted to him; and what I mean to adduce from these facts is this, that this association should endeavour to found some source of education (a Chair of Architecture in the College, for instance), or class-work in connexion with some institution, where a youth could largely augment his knowledge, either in the day time or in an evening (for in this high-pressure age in which we live there is little time for leisure), and which would go hand in hand with his daywork at the office, and render him at the end of his term a really useful member of a responsible profession.

Touching upon what may be called public matters, I think I may say that the thanks of this association are due to the Corporation of Newcastle-on-Tyne for the admirable and impartial competitions which took place last year for the Police Barracks* and Fever Hospital. The competition was issued to the public on what seemed to me to be fair conditions. The drawings were adjudged by a competent and well-known architect, and were exhibited without stint to the public. The few murmurs that followed in the wake are matter for regret. We cannot all win, and a loser should always die game.

It is most probably within the knowledge of every gentleman present, that there will most likely be other competitions to follow at an early date for other public buildings, abattoirs, baths, college, and perhaps a town-hall; and it is to be hoped they may be carried out on similar lines to the last, or in case those conditions were not so fair as might be desirable, I have no doubt the members of the City Council, as practical men, would listen to any suggestion this or any similar association might wish to offer.

While on the subject of public buildings, we come to the very important and interesting question of where to place them, and here a very curious fact presents itself. Our large cities and towns are developing and extending at an enormous rate. The old thoroughfares (like the old sewers) are inadequate.

Buildings are now required that fifty years ago were not dreamed of, and there is a difficulty in procuring suitable sites for them. It is clear we must augment our thoroughfares in what we call improvements to the city, and that all our public buildings should adorn or beautify the city. This, it must be admitted, is a very broad subject. But is it not a fact that all so-called improvements not only in this city, but almost in all others, are not the result of a well-devised and comprehensive scheme, but one worked out piecemeal by the Council collectively, where nearly every member indi-

* Two of the premiated designs for these we shall illustrate shortly.

vidually would hesitate before attempting such a task? Let us see what is done by a neighbouring Corporation, the River Tyne Commissioners. They have charge of what is now a noble river. It was not always so. They have improved it. But they do not attempt to do it themselves. They placed the matter in the hands of an eminent man years ago, and consistently follow a well-devised and comprehensive scheme which may yet take many years to complete. I do not mean to say that a city like this could be improved at such a rate as the river has been; but I do say this, that if the planning of the improvements to a city were placed in the hands of a similar eminent man (and it seems to me that, as the question is of such architectural importance, that man should be an architect), and he was asked to thoroughly consider, and show the best way a city could be improved to meet the existing and future wants, I have no doubt the result would be similar to what we see in the river improvements, viz., a whole scheme, a comprehensive plan in every respect, and not one of shreds and patches.

THE INFLUENCE OF DOCTRINE ON CHURCH ARCHITECTURE.

On Monday evening last the Rev. C. Hargrave delivered a lecture on "The Influence of Doctrine on Church Architecture," in the Lecture Hall of the Leeds Architectural Society. Mr. Birchall presided.

The lecturer said that the business of the artist was to educate and gratify the taste of the public, but the architect more than any other artist worked for all, for he could not keep his work to himself or for his employers, even if he desired to do so. But most of all those specially interested in religion were entitled to give an opinion on an art which began with religion, which in the service of religion attained its greatest and most enduring triumphs, and which inevitably reacted, to exalt or degrade, upon the religious ideas it gave effect to. The subject of the lecture was, how the forms of religious architecture were moulded by beliefs which they served, or at least how they had been in the past and must be again if our architecture was to be a living and not merely an imitative art. All religious buildings might be divided into two classes. There were those which were built for the sake of the object to which worship or reverence was paid, and those whose purpose was to serve the worshippers. These distinct objects might be united and often were confused, but according as the architect had one or other in his mind as the chief end and aim of his work, would the whole plan of the building vary. The first was the object of almost all, perhaps all, pre-Christian, and, outside Mahometanism, all un-Christian buildings of any size and pretensions. The worshippers might gather round the temple in porch or portico, within it only the priests were allowed, and within the sacred shrine perhaps only one of them, or the shrine might, as in some Hindoo temples, be inaccessible. After giving various examples of the first class of buildings, the lecturer went on to say that the second class probably had its first example in the Roman basilica, which from places of public meeting for the administration of justice were adopted by the Christians for public worship and preaching. This became the general model for all Christian churches, the aisle, once sheltered porticos round the open court, being taken into the building, and all the parts of a Gothic cathedral were but developments of the basilica. But in Roman Catholic worship the great need was to have the altar so situated that all might assist at the sacrifice, following it with their eyes rather than with their ears; and secondly, as there were many sacrificing priests, and many saints who were secondary objects of worship, there should be room for more than one altar. Hence the invariable feature of all Mediaeval churches, naves for the people, choir for sacrificing priest, and the endless variety of plan accordingly as chapels were thrown out here and there for an altar in honour of some saint. But since the Reformation church architecture seemed to have lost the very life of art. It no longer sought to express an idea or adapt material forms to spiritual ends. It tried only to effect something strange, or beautiful, or merely useful. There were now three forms of Christian worship,—the sacrificial, the liturgical,

and the congregational. An architect, before attempting a plan, should know which of these forms he designed to serve. At the present time it was seldom or never asked that the building be simply in honour of God or the saints. Every church was a meeting-house, but the purpose of meeting varied. The centre of unity might be the altar, or the choir, or the pulpit, and the plan and style must vary accordingly. It was the worst condemnation of a Dissenting chapel to say it would do for an Anglican church, or, again, of the Church that it might be mistaken for a Roman Catholic place of worship. Different ideas were associated with the three forms, and should be expressed in the buildings.

MR. WHICHCORD'S APPEAL TO "ORGANISE."

Sir,—I am not an architect, but you will, perhaps, allow me space for a word or two respecting the appeal at the latter part of the letter of Mr. John Whichcord, which appeared in the *Builder* of the 5th inst. (p. 40).

My professional work brings me into frequent communication with architects in various parts of the country, and from this and a perusal of the *Builder* I am kept partially posted up in architectural questions. Many of my more agreeable recollections are of dealings with members of the profession, with whom I therefore feel some special grounds of sympathy.

Mr. John Whichcord says the Royal Institute is the only body which can help his profession. As an outsider I should venture to assert that this is but a half-truth. A large body of architects in active practice throughout the country are not for the Institute or its ways; others, men of high professional tone, hold themselves free from all organisations, and feel as though they were strong enough to stand without "society props," as I have heard it phrased. Mr. Whichcord will excuse me when I say that until these men, and until all the professional architects in the kingdom (whether now allied to any societies or not) can be induced to throw in their lot with the Institute, the influence of that body will never be the factor with architects, nor with public bodies, nor with the public at large, that it ought to be, and may yet become. Now, it seems to me that, if those who regard themselves as persons of importance in the profession, would step down from their pedestals for a brief period and, in a thoughtful and kindly way, consider what could be done to weld the scattered architects of the country into one solid phalanx, it is possible that they might find their efforts seconded by many who are now utterly indifferent. This would form a fitting programme, let me say, for the jubilee year of the Institute, and might usefully occupy the organising faculties of Mr. Whichcord, Mr. Cole A. Adams, and other active members.

If there is nothing in the conditions of membership which prevents architects joining the Institute, it ought not to be an impossible task to get the outlying body of architects throughout the country to add their names to the roll. Let me, however, ask one plain question, which perhaps Mr. Whichcord will answer through your pages, in an equally plain way. Do Mr. Whichcord and his co-partners really wish to extend the membership of the Institute, so as to embrace all the architects of the kingdom? Or do they wish to make their society a "close" corporation, representing but a minority of the men in the profession? If the former, how does the Institute propose to reach the mass of architects now outside of it? It appears to a plain man like myself that if the Institute could, in its fiftieth year, say that it had trebled or quadrupled its membership, this would be a fact in its history not unworthy of recording.

Let me say, in conclusion, I am convinced that if the architectural profession is to be lifted out of the troubles which "encompass it about," this will not be accomplished by anything short of legislating for the many, and securing a harmonious and united pull from the whole team. Who is to take the initiative? Will the Council of the Institute? Or will it be left to some other society to address the various architects of the country?

There is no doubt in my mind but that if the Institute would lay aside for the moment its great manner, and apply itself to the work of benefiting the whole profession, by getting the

names of all British architects on its roll, it would ultimately be in a position to speak "as one having authority," and command that respect which numbers always enforce,—a respect, it is well known, that it has not now got; and let me add, which it will never have until such time as it has succeeded in enrolling those architects who now go their way independent of it. It may be objected that in enrolling all practising architects, some doubtful men might be included; this, if so, would speedily work its own remedy. Once that all architects are banded together in one association, the "disbarring" of a misbehaving member would be felt as a penalty having some force, and thus lead to good behaviour all round, and a corresponding rise in public estimation.

The members of the Council cannot do better than apply the advice of their colleague, and "organise," until they have made Conduit-street the legislative centre of the profession.

D. E. C.

MONUMENT TO THE LATE GENERAL MARGUERITE.

The Town Council of Manheulles, Lorraine, in response to the expressed wishes of many inhabitants of the commune and many military men, are setting on foot a monument to the memory of General Marguerite, who fell at the head of his division of cavalry in a charge at Sedan, having before been distinguished by many brilliant episodes in his military career. The scheme has the special countenance of the French Government, and the Minister of the Interior is charged with seeing it carried into execution, the requisite funds being raised by public subscription; for which a special appeal is made to the inhabitants of the commune of Manheulles, to those of "notre chère Lorraine," to the inhabitants of Port-à-Mousson, where the General distinguished himself in an action on August 12, 1870, and the inhabitants of Sedan and its environs. It is intended that the pedestal should bear plaques or reliefs commemorating the names of those of the *canton des Fresnes* who fell in 1870-71.

The estimated cost of the monument is about 30,000 francs, and its design has been entrusted to M. Lucien Leblanc, architect, who is connected with the public works department, and M. Albert Lefeuve, sculptor, Chevalier of the Legion of Honour. It is expected that the monument will be completed and inaugurated some time in April next.

INTERNATIONAL HEALTH EXHIBITION.

We have received the following communication from the secretary:—

The Sub-Committee on Heating, Lighting, Ventilation, and Sanitation, have prepared a memorandum indicating the principal exhibits which it is intended should be comprised within Classes 24, 25, and 26 of the Exhibition. In Class 24 will be included grates, stoves, kitcheners, ranges, boilers, &c., for domestic use, and all methods of warming, with or without provision for ventilation. Domestic kitcheners will be included in this class, but appliances for cookery on a large scale will more properly be arranged under Class 6 (Cookery, &c.). Furnaces and steam boilers for manufacturing operations are not considered to be within the scope of the present Exhibition. In Class 25 (ventilators, &c.) will be included special appliances for ventilation, other than those which may be considered more suitable for Class 24. These will include means for cooling the air supplied to rooms; means for improving the condition of the air in rooms; methods for testing air; the results of experimental researches into the state of air vitiated by combustion or by respiration; results of experiments on ventilation; and any other means of effecting improvement in matters relating to this class, or of diffusing knowledge about them. Class 27 takes in lighting by any means, electricity, gas, oil, candles, &c. Electric lighting, however, is to be limited to illustrations of its application to domestic lighting. Its use on a large scale will be practically illustrated by the arrangements made for lighting the Exhibition itself. The commercial manufacture of gas is not included, though its production on a small scale for private use is. Exhibits showing the progress of domestic lighting, and affording means of comparison between old and new systems are specially desired. Photometric and other tests for illuminating materials will be admitted.

It is also desired to illustrate, in as practical a manner as possible, the relation of industrial conditions and processes to health; and to the sub-committee charged with advising on this department of the Exhibition the name of the "Workshop Sub-

Committee" has been given. The place of production of all articles used by man is for the present purpose spoken of as the "Workshop." The following heads show the principal subjects which the sub-committee are anxious should be illustrated in the several classes of this department, the illustrations being expected to include alike the conditions of injury to health and the means proposed for improvement:—(a) Ventilation of the workshops,—by simple discharge of internal air; by destroying the offensive or injurious quality of discharged air. (b) Effluvia nuisances,—by condensing and utilising vapours; by consuming vapours; by other means, as in gas works. (c) Dust nuisances, e.g.,—in needle-grinding, mother-of-pearl working, in weaving-sheds. (d) Danger from mineral poisons, e.g.,—in arsenic works, white-lead works, playing-card making, card-brazing, phosphorus and match manufacture. (e) Danger from animal poisons, e.g.,—in wool-sorting, raveling. (f) Prevention of accidents in the workshop, e.g.,—Protection against heat or injury to the eyes; protection against explosions in the mine and elsewhere. Besides apparatus used, or proposed for use, with a view to minimise danger to life and health, the exhibits may comprise models, drawings, specimens both of harmful products and improved products, &c., and the committee will especially glad to receive collections of specimens, models, diagrams, photographs, &c., showing existing evils or noxious conditions which have been modified by recent improvements.

THE FALL OF A RAILWAY BRIDGE IN LANCASHIRE.

THE adjourned inquest on the bodies of Mr. J. P. Hammonds and the six other employees of the London and North-Western Railway Company, who lost their lives on Sunday, the 6th inst., by the falling of Coppull-lane Bridge, between Wigan and Preston, was resumed on Monday last at Coppull, before Mr. W. Gilbertson, county coroner for the district. Mr. Thompson, solicitor, of Euston, London, appeared for the London and North-Western Railway Company, who were also represented by Mr. S. B. Worthington, chief engineer of the northern division; Mr. W. B. Worthington and Mr. R. Jones, assistant engineers for the district; Mr. Tongue, district passenger superintendent; Mr. Taberner, station-master, Wigan; and Mr. A. W. Ditchfield, permanent way inspector. Mr. Thompson appeared for the London and North-Western Railway Company.

Mr. A. W. Ditchfield, permanent way inspector, said he had charge of this district. He knew the Coppull-lane Bridge, and had instructions from Mr. Worthington to assist in removing it. They commenced to clear the bridge on the Friday by removing the earth and roadway over it. Mr. Hammonds went from Manchester with witness to the bridge, and they had completed the preliminary work by about four o'clock on the Saturday afternoon. The bridge was then bare to the brickwork, except the lower portion of the parapet wall. On Sunday morning witness went again. Mr. Hammonds arriving on the spot about half-past eight. The arch of the bridge was much flattened, but no change had taken place in it for some time. On the Sunday morning, before the arrival of Mr. Hammonds, they started to remove the remainder of the parapet. On Mr. Hammonds coming to the spot they unloaded some timber to make the temporary roadway. Mr. Hammonds about half-past nine went on to the bridge, and ordered Donald to take out the key-brick of the outer ring of the arch, which was of two-brick length, or 1 ft. 6 in. Witness did not think there was any danger: he was under the bridge several times. Hammonds stopped on the bridge for some time, but before the firm had been completely out through he went on to the line in order to give instructions as to the uprights to be placed on the line for the beams. Hammonds, who was standing in the 6-ft. span, he should like to have some breakfast, and witness just then left him to leave his coat at the platelayers' house. As he was returning he heard the bridge fall. This would be about ten minutes after the passenger-train for the North had passed the bridge. The arch was considerably flattened, but he had not noticed any change in it for the last few years, although he had frequently looked at it.

George Donald, ganger, said he was, by orders, assisting in the pulling down of the bridge. He had known the bridge for a dozen years, and had never seen any change in it during that time. It was always a bit "flatish." When Mr. Hammonds arrived on Sunday morning, the roadway and everything else had been removed from the top of the bridge, and the bricks of the arch laid bare. Mr. Hammonds went on the top of the bridge just before the train came by, got hold of a crowbar and barred the key-brick out on the north side of the bridge, and told witness and two others to remove that course of bricks across the bridge. They commenced taking out the bricks about 9.30, and finished five minutes after the train had gone by. Mr. Hammonds went underneath, and witness

stepped on to the beams, waiting further orders. He had only stood there a short time when the arch, without the slightest warning, fell with a crash. He did not see whether the centre of the bridge rose before it fell; he did not notice anything of the sort.

Mr. S. B. Worthington, of Manchester, Engineer for the Northern Division of the London and North-Western Railway Company, said he had known this bridge for twenty-four years, that being since the time when he took charge of this portion of the North Union Railway. The arch was a semi-ellipse, but, as described by one of the witnesses, rather flat on the crown. He believed the arch would take this shape shortly after it was built; it had been so ever since he had known it. It was not, in his opinion, by reason of any process of decay that the bridge became flattened. The arch was 15 in. thick at the crown, and gradually widened out until it was 4 ft. at the haunches. It was a substantial structure, and was erected according to the usual mode of construction. About two months ago he was informed that there was a slight crack in the arch. From the description he did not anticipate any danger; but taking all the circumstances into consideration, and especially that though there were no coal workings to their knowledge underneath the bridge, mining was carried on in the neighbourhood, he thought it better to order the removal of the bridge, and cast-iron girders had been ordered for the purpose of replacing it. The mode adopted for taking down the bridge was undoubtedly the right one, but the time adopted was not the right time. Hammonds was the bridge inspector for the Manchester district, and was a man of very large experience of this class of work. He had taken down many bridges, and for four years past had been engaged, amongst other things, in heavy repairs to the Morley tunnel in Yorkshire, which was a difficult and troublesome operation. During forty years' experience of this class of men, witness had not known one in whose assiduity and ability he had had greater confidence. Hammonds himself decided as to the mode of taking down the bridge. He, however, commenced too soon. The men should not have commenced to take the bricks out until a short time before they meant to drop the arch. There were several trains to pass when they commenced the work, and if they had delayed taking out the bricks until eleven o'clock they would have had ample time to clear everything away before four o'clock in the afternoon, when the next passenger train passed, and the accident would not have happened. This bridge was built in 1836. So far as he could judge, there was nothing on the face of the bridge to make Hammonds suppose that it was defective in any way, but he was bound to say that on looking at the wreck the mortar appeared of a more crumbling nature than he should have expected.

In reply to a jurymen, witness said that the instructions issued stated that the bridge had to be pulled down between half-past eleven and four o'clock. The impatience to push forward the work seemed to him utterly unaccountable.

The jury returned a verdict to the effect that the deaths had been accidentally caused by the premature falling of the bridge.

The foregoing report is condensed from the *Manchester Courier*.

THE CONFERENCE OF FRENCH ARCHITECTS AT NICE.

SINCE writing the paragraph in our "Notes" (see ante) calling attention to this intended Conference, we have received a very courteous communication from the President of the "Société des Architectes et des Ingénieurs des Alpes Maritimes," M. Levrot, calling attention to some further subjects of interest to be considered in the programme of the meeting, and adding "Nous serions heureux que nos honorables confrères Anglais, si forts en matière d'hygiène, si compétents lorsqu'il s'agit de la Grèce ou de l'Inde, nous fassent l'honneur et le grand plaisir de participer à nos travaux." The Congress, it appears from the report annexed to M. Levrot's letter, is in fact a double one; a congress not public, and local (regional), held from February 8th to 11th inclusive, and an international congress held from the 12th to the 19th inclusive. The first is more for the grave matters of professional status and practice (as mentioned in our "Notes"), the second more for the discussion of artistic subjects. The dates and subjects of meetings of the international congress are as follow:—

Tuesday, Feb. 12th.—Opening of the Congress. Paper on "Polychromy applied to Constructions" (by M. Chas. Garnier). Afternoon: visit to the International Exhibition at Nice.

Wednesday, 13th.—"The simultaneous Treatment of Architecture, Sculpture, and Painting." Various visits.

Thursday, 14th.—Visit to the Principality of Monaco; the Palace, Cathedral, and Museum.

Conference on the Architecture of Summer Towns and Winter Towns.

Friday, 15th.—"Cimiez: its Arena, Forum, and Abbey." Discussion on the Sanitary Work of Towns.

Saturday, 16th.—Excursion from Nice to Estérel. *Sunday, 17th.*—Excursion to Cannes. Public Fête at the Place d'Armes.

Monday, 18th.—Excursion to San Remo and to Ventimille and its ancient theatre.

Tuesday, 19th.—Discussion on the Marbles and Building Stones of the Neighbourhood. Consideration of the Industrial Products connected with Construction. In the evening, closing dinner.

Further information and prospectus can be obtained from the Secretaries for the "Séant à Nice," 23, Avenue de la Grèce, Nice; and it is desired that those wishing to be present should apply before the 31st of this month if possible.

ROYAL ACADEMY.

ADMISSIONS TO THE ARCHITECTURAL SCHOOL.

Upper School.—A. Howse, A. Kent, and E. S. Norton.

Lower School.—L. Ambler, C. S. Appleton, W. H. Bidlake, F. Brown, E. A. Coxhead, H. W. Crickmay, A. Dovaston, W. J. W. Ferguson, P. Figgis, H. R. Goodham, F. C. Hart J. Lord, F. S. Oulvie, E. W. Pickford, T. B. Rutherford, H. D. Walton, and R. W. Williams. *Probationers.*—C. J. L. Hall, A. B. Mitchell, J. E. Newberry, E. H. Sedding, E. H. Selby, Van Ja. A. Straaten, and F. W. Troup.

SALES OF BUILDING LAND AT THE EAST END.

ON Thursday in last week, by order of the Metropolitan Board of Works, Messrs Moore & Moore submitted to public competition at the Auction Mart, Tokenhouse-yard, a large number of freehold building sites situated in Whitechapel and Wapping. The first portion of the property offered was that in Whitechapel, comprising a total area of nearly three acres, and situated close to the London Docks, the Mint, the Tower, and railway goods stations. The property was offered in four lots, and the particulars stated that the vendors, under the provisions of the Artisans' and Labourers' Dwellings Acts of 1875-82, was bound to sell or let the lands for the purpose of the erection thereon of dwellings for the working classes, and that the purchase of each lot would be subject to the obligation to build and maintain such dwellings. The first lot offered, situated near Royal Mint-street, with a frontage of 179 ft. to Cartwright-street, and containing an area of 6,398 sq. ft., was sold for 950*l.* For the adjoining lot, next offered, and containing an area of 25,422 sq. ft., there was a very animated and warm competition between two bidders. The lot was put up at 1,000*l.*, when the advance of 500*l.* was at once made, and the hammer ultimately fell at 3,650*l.*, the purchaser being warmly cheered by the company present. The two following lots, one containing 46,420 sq. ft., and the other 52,000 sq. ft., were withdrawn at 5,490*l.* and 4,290*l.* respectively, being the highest sums offered. The Wapping property was next offered. It consisted of thirteen lots, comprising property producing 410*l.* per annum, together with freehold building land, close to the Wapping entrances to the London Docks, and described as well adapted for the erection of warehouses or manufacturing premises. There was only a very limited demand for this property, and the only lots sold were a freehold granary in Wapping High-street, let on lease expiring in 1887, at 40*l.* per annum, which realised 790*l.*; and a freehold warehouse near Wapping High-street, let on lease expiring in 1888, at a yearly rental of 60*l.*, which was sold for 1,100*l.*

Last week Messrs. Moore & Moore offered for sale at the Auction Mart, Tokenhouse-yard, a plot of freehold building land in the Broadway, at Stratford, covering an area of about one acre. There was an active competition for the property. The first bid was 1,000*l.*, and it was ultimately sold for 1,950*l.*

St. Alban's Abbey.—The Freemasons attending the services at St. Alban's Abbey have recently made an addition to the pulpit (which was presented by the Freemasons of England) in the shape of a pair of three-light brass standards for candles, designed by Mr. John Oldrid Scott, and manufactured by Messrs. Henry Marlow & Co., of 127, Regent-street.

BUILDING PATENT RECORD.* APPLICATIONS FOR LETTERS PATENT.

Jan. 4, 1884.

649. T. Jones, Sedgley. Floors or pavements and wall linings.
650. T. Jones, Sedgley. Window-fastenings.
657. T. W. Twyford, Hanley. Connecting supply apparatus with water-closet basins. (Comm. by E. Aspinall, New York, U.S.A.)
661. E. Woolfenden, Rochdale. Ventilators.
670. F. G. Barlow, Wexford. Cows for chimneys, &c.
671. A. Putney, London. Wood floorings. (Comp. Spec.)
703. J. B. McCallum, Blackburn. Water-closets.
711. G. Bisley, London. Fasteners for window sashes.

Jan. 5, 1884.

714. T. W. Helliwell, Brighouse. Glazing greenhouses, &c.
734. W. J. Wheeler, Richmond. Wood paving.
790. G. Greenwood, Cuckfield. Water-waste preventers.
799. E. H. Harling, London. Window-fasteners.
801. T. P. Bache and G. Salter, West Bromwich. Door-springs.

Jan. 7, 1884.

822. A. C. Smith, London. Spiral updraught exhaust cowl.
833. D. W. Petrie, Liverpool. Spring apparatus for doors.
837. J. G. Strong & Sons, Dublin. Cast-iron water-closets.
858. F. H. Matthews, Slough. Glazing glass structures. (Comp. Spec.)
881. T. R. Shelley, Birmingham. Glazing structures.
887. S. Reeve, London. Warming and ventilating apartments, &c.
899. F. C. Biddiscombe, Manchester. Cisterns for water-closets, &c.
902. J. G. Stadler and E. Schmid, Switzerland. A ridge tile.

Jan. 8, 1884.

945. F. R. Walldgeose, London. Screw-down safety sash-fastening.
953. W. E. Baker, Aldershot. Plastering machines.
955. J. D. Wright, London. Chimney-top and ventilator.
1,003. H. C. Collyer, London. Supporting and actuating Venetian blinds.
1,013. F. Newman, Ryde. Flushing doors for sewers, &c.
1,019. A. H. Smith, Bristol. Stoves for heating and ventilating.
1,020. T. Jones and S. Griffin, London. Decorative tiles.
1,022. E. Edwards, London. Movable Venetian blinds. (Comm. by A. Cheneval, Maflo, Belgium.)

Jan. 9, 1884.

- 1,029. F. F. Brown, Chester. Parquet floors.
1,046. H. Sutcliffe, Halifax. Water-closets.
1,061. J. Fagan, Skipton. Water-closets. (Comp. Spec.)
1,062. T. Morris, Bolton. Automatic tubes for hot-air heating.
1,088. J. Beckett, Crosshill. Ventilating devices for house-drains.

Jan. 10, 1884.

- 1,112. T. S. Wilson and H. T. Johnson, Manchester. Ventilators of soil-pipes, &c.
1,125. J. Eyraud, Birmingham. Window-blind fittings.
1,155. F. L. Merrill, London. Centripetal cowl.
1,159. J. Parrott, Wallington. Trap and ventilator for soil or waste pipes.
1,185. R. Walsam and J. Walsam. Paving and other tiles.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Jan. 8, 1884.

- 4,227. T. J. Palmer, Carshalton. Decorative material for walls. Sept. 3, 1883.
4,257. R. Adams, London. Toothed racks for opening and closing fanlights, windows, &c. Sept. 4, 1883.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

4,308. J. C. Blomfield, London. Manufacture of bricks, &c. Sept. 7, 1883.

Jan. 11, 1884.

4,384. E. J. Smith, London. Locks or fastenings. Sept. 13, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending January 12, 1884.
2,417. J. Whitehouse, Tipton. Stench trap for street gutters. May 12, 1883. Price 2d.

The box is divided by vertical partitions depending from the grating on the top. The outlets are made near the top of the box, and are governed by valves. (Pro. Pro.)

2,459. T. Hale, Claydon. Domestic fire-escape. May 16, 1883. Price 6d.

A cross bar that is placed across the inner side of the window is supported by uprights standing on the sill. A rib is supported from the cross bar, and, over the rib, on the end thereof, passes a rope, attached to which is a canvas bag.

2,881. H. H. Leigh, London. Fire-grates. (Comm. by Goujet & Cie, Paris.) June 8, 1883. Price 6d.

Rocking bars are used, which have a conical ridge and two fluke-like extensions on their upper sides with openings for the passage of air.

IRON AND CONCRETE.

SIR,—In reference to your note of last week I have only to thank the gentlemen who have taken part in a correspondence which has produced such very instructive letters [see pp. 649, 704, 773, 804, 842, and 876 of last volume of *Builder*, and pp. 42, 80 of current vol.]

If those gentlemen would decide upon the composition of two beams, each 15 ft. long, by 1 ft. 10 in. wide and 12 in. deep, one to be of iron and concrete, and the other of concrete only, and have them made and seasoned and tested with a central load of 7½ tons (or half the weight placed upon Lieut.-Colonel Seddon's slab), my original question of Nov. 17, 1883, would be answered, and I should be willing to contribute a guinea towards the cost of such tests.

The only question is whether any other members of the profession consider the subject of sufficient interest to contribute also, in order to verify a system of construction which they could recommend to their clients for economy and safety.

EDWARD J. TARVER.

Jan. 16, 1884.

"ENSILAGE."

SIR,—As a subscriber and reader of your valuable paper, I have noticed many interesting articles relative to the construction of silos and the preservation of green crops. I paid particular attention to the article headed "Improved Form of Silo" in your issue of Jan. 5th (p. 41),—improvements which I see in your issue of the 12th, have been patented by Mr. Potter. In your same number appears, under the heading of "Ensilage," and signed "B," a letter asking any one who has had experience in the construction of silos as to the possibility of the plan proposed to be adopted by him proving a success. I see no reason whatever why the plan should not succeed. A great deal depends upon the class of cement used and the proper mixture of the same. But I should advise your correspondent, "B," if it be possible to fill in the gravel-pit to a height of say 1 ft. or 1 ft. 6 in. above the water-line, so as to allow the bottom of his silo to be at least 2 ft. above the water-line, the floor being concrete, 6 in. or 9 in. thick, floated over with 1 in. of Portland cement and sand in equal parts. The walls may be carried up to any height required, the ground being raised at one end so as to allow of easy approach to the top of the silo for filling and emptying purposes.

If I am not trespassing upon your space, perhaps the following method of silo construction may be of use to some of the many persons who are daily making the best and cheapest method of preserving their crops in a green state their study. The following silos were built partly under my superintendence in the fast-growing State of Kansas, U.S.A., and are owned by the Consolidated Sheep Ranch Company, and used chiefly for the preservation of green rye. The silos were built in a naturally formed ravine or the bed of a dried-up creek, so that there was little or, practically speaking, no labour in excavation. The walls were built entirely of rough-hewn stone, taken from a quarry near by, and lined inside with cement,

1 in. thick. The walls were carried up perpendicularly from the bottom of the ravine to the level of the surrounding part of the farm, a depth of at least 45 ft., and filled in on two sides and one end with soil, so that the silo was entirely underground, with the exception of the one end which remained exposed to view. At the bottom of the exposed end of the silo was formed an opening filled in with a strong-framed door, made to open outwards, and from the opening thus formed the ensilage is taken, placed in carts, and carried to the different flocks. This doorway is approached by a road formed on an easy grade. The silos are built in pairs, each pair being covered by one roof, and separated only by a division wall, with an opening formed in the bottom, so that when the first silo is emptied the second one can be disposed of by the same means. By this arrangement two entirely different crops may be preserved. The silos are filled at the end which runs level with the farm. At this end stands the steam-cutting machinery. The crop when cut is carried by means of tip-up boxes, running on iron rods suspended in the roof-space, and travelling along by means of a chain and pulley, two to each silo, the rods being about 12 ft. apart, and running the longitudinal way of the building. This simple process is worked by one man attending to the boxes, besides those required at the machine. The boxes can be pulled up at any point, and tipped up, the contents finding their own level. It is necessary to send a man down occasionally to level over the surface as the silos are filled. But even that trouble may be saved if care is taken in the proper working of the tip-up boxes. When filled the crop is weighted in the ordinary way, and as the ensilage is taken from the bottom it is not necessary to remove any of the top weight or covering. The great object is to keep the crop as air-tight as possible. By adopting this method of silo building, filling, and emptying, there is undoubtedly a great saving in labour alone. The question for the farmer is, which is the cheapest and best way of preserving a green crop? And if it comes to a large outlay of money on inventions which in themselves are undoubtedly good but practically unnecessary, and which do not deal with the chief object in view, viz., that of keeping the silo as air-tight as possible from the time it is filled until the day it is emptied,—the farmer will find that it is impossible for him to preserve ensilage to feed his stock for market at a profit such as he might gain by adopting the simpler method.

FRANK ROBERTS.

P.S.—I forgot to state that the size of each silo is about 40 ft. by 40 ft. by 45 ft. deep. Each block of two would be about 90 ft. by 40 ft. by 45 ft.

WATER SUPPLY OF THE CITY OF LONDON.

SIR,—The City Solicitor has issued a circular directing attention to the Bill proposed to be introduced by the Corporation of the City of London with reference to the above question.

The Bill appears to have been very carefully drawn on lines equally equitable to the water companies and to the consumers. One leading feature of the Bill is to give the right to a consumer to demand a supply of water by meter at such rates as shall be deemed right by the Legislature.

This right exists under the 41st section of the New River Company's Act, where the supply of water is required for other than the purposes named in the 35th section, viz., domestic purposes.

My contention with the New River Company is and has been that the water supplied to these and other premises belonging to me in Billiter-street is not for domestic purposes, but for commercial and sanitary purposes.

The premises are of the rateable annual value of 1,000l. and 792l. respectively, and there are twelve water-closets in each building.

The quantity of water actually consumed in the four years ending January, 1883, as registered by Beck & Co.'s meters, was 1,336,267 gallons.

The amount charged by the company for this supply was 544l. or 38d. 10s. per annum,—something more than 2s. 3d. per 1,000 gallons, and more than 70c. for each cubic foot of water.

But if the contention of the New River Company that the supply was for domestic purposes was real and sincere, how is it that they did not exercise the powers they say their Act of Parliament conferred, and charge 3 per cent. on the annual value of the property, 12s. for each single water-closet, and 6s. for each additional water-closet, in which case they could have charged 612. 11s. per annum, or 246l. 4s. for the four years alluded to,—a sum which would have been equivalent to 3s. 8d. per 1,000 gallons, or more than six times the price of gas?

I believe that the policy adopted by the New

River Company of charging so much less than they contend they are entitled to charge has deterred many consumers from taking action in the matter, lest their opposition might provoke reprisals; indeed, a company holding a large amount of office property in the City stated that his company preferred to pay what they knew was an excessive and unfair rate, rather than join in litigation which might involve them in a heavier charge for water.

I think a fair deduction to be drawn is that the New River Company entertained grave doubts as to the righteousness of the charges they were making, knowing full well that the supply was not for the domestic purposes contemplated by the Act of Parliament.

THOS. HORREY.

No. 11, Billiter-square, E.C.

MYSTERIOUS TENDERS.

SIR,—We are not unaccustomed to see wide differences between the tenders for buildings which comprise many trades; but when we see a difference of 124*l.* and 45*l.* between the highest and lowest tender for a lift for two new parish offices, Birmingham, the mystery calls for explanation.

Possibly the architect may have left the competitors to recommend what each would consider best for the purpose, for each tender cannot possibly represent the same type or quality of work. Even had he gone so far as, for instance, to specify "a lift to raise 5 cwt. by hydraulic power," it might cost anything from 120*l.* to 500*l.*, and full value might be given for any price between these limits.

In arranging engineering contracts, whether for machinery, systems of heating, ventilating, lighting, cooking, lifting, &c., the only way to compare prices is to know beforehand exactly what one wants; otherwise the result is a set of tenders which may be damaging to an engineer who has estimated for better work than is required, and may get unfairly quoted as an "expensive man."

ARCHITECT.

SALFORD SEWAGE WORKS.

SIR,—I am always loth that my name should appear in print in relation to matters of a personal nature, first, because I hold advertising to be unprofessional and obtrusive; and, secondly, because matters of a private character cannot be of the least interest to the public. I am not disposed to enter into any controversy as to the authorship of the Salford Sewage Works. Two separate and almost distinct schemes were prepared for the outfall works; for when the first project came to be critically examined, it was found that certain changes were imperatively necessary.

The tanks and head-works were extensively altered in dimensions and design.

2. For a 40-h.p. engine to drive the mixing machinery, turbines, to be worked by the effluent water, were substituted, which, of course, effects a large saving in fuel and labour.

3. The tanks, instead of being situated in low ground, were placed at such a height as to command certain land which adjoins them, as a necessary precaution in case filtration should be found necessary in addition to precipitation.

4. Instead of centrifugal pumps, slow-motion engines and pumps were erected, as being better suited for continuous working; and

5. A variety of other radical changes were made which altered the entire character of the works.

If, by any possibility, this matter should be of general interest, which I very much doubt, I shall be happy to allow an inspection of the whole of the drawings,—for the original as well as of the revised schemes. The plans will speak for themselves.

I shall not trouble you further on this matter.

ARTHUR JACOB.

Town-hall, Salford, Jan. 16th, 1884.

Rendle's Patent Glazing.—We have received a description, accompanied by a sectional drawing, of a new system of glazing for roofs, patented by Messrs. Edgcombe Rendle & Co., and called the "Invincible," as being impervious to the attacks of rain. It appears likely to answer to its name. The edges of the glass are securely clipped between a capping above and a hollow bar beneath, forming a water channel, the capping being held tight against the upper surface of the glass by a screw bolt and nut, the bolt passing between the edges of the contiguous squares of glass and connecting the capping and the bar. Should any water be driven through between the capping and the glass, it drops between the edges of the glass into the hollow bar, which acts as a small gutter, and carries it off. The lower edge of the bar has an attachment to form a channel for condensation drip on the usual principle. The thing seems very complete and efficient, and the screw-bolt and nut allow of the capping being easily tightened on the glass whenever it becomes necessary.

COMPETITIONS.

Board Schools, Northampton.—After two days' examination and consideration of the eighty-one sets of plans sent in for the proposed new Board schools in Military-road, the referee, Prof. T. Roger Smith, selected two bearing the mottoes "N" and "Plan," both of which turned out to be by Messrs. W. Talbot Brown & Charles Dorman, joint architects, Wellingborough and London. Of the whole number of designs, twenty-one bearing the following mottoes obtained five-sixths of the full number of marks:—"Whiston," "Perseverantia," "N," "Christmas," "Croquis," "Lux" (a), "Plan," "Straight-forward," "Labor omnia vincit," "Nothing like Leather," "52," "Experientia," "Simplex," "Practical Utility," "Knowledge is Power," "Measure for Measure," "Light, Air, and Economy," "Advancement," "Ipsissima," "Late," and "Study." The final selection was between "Light, Air, and Economy," "Straight-forward," "Lux" (a), "Measure for measure," "Plan," and "N," the two latter being ultimately chosen, of which "N" has been decided upon by the members of the Board. In the design marked "N," the main front faces the street, with the boys' entrance at the north-west corner, and the doors for girls and infants at the opposite end. In the boys' department four class-rooms are provided, and a room sufficiently large to accommodate two classes, a sliding glass partition being arranged in the centre for the purpose of dividing the classes. The divisions between the large room and the class-rooms are proposed to be partly glazed, by which means the headmaster would be enabled to overlook the whole of the class-rooms when at his desk. The girls' department is provided with three class-rooms only, but in other respects the arrangements are exactly the same as in the boys' divisions. In the infants' department four class-rooms, a babies' room, and a large apartment, are provided. Every room has windows on two sides, and some on three, while ventilation is provided for by means of upright shafts, sashes made to open, openings in the centre of the ceilings, and Boyle's ventilators placed in the turrets. Steam is suggested for heating purposes. The walls are proposed to be of local bricks, with Bath stone dressings to doors and windows. The roofs to be covered with green slates and red ridge tiles, the whole of the rooms to have boarded dados, the floors to be covered with wood blocks, and the playgrounds to be asphalted. The estimated cost is 8,700*l.*

Hanley.—The Presbyterians of Hanley are about to pull down their present place of worship and rebuild it, in consequence of a fire having partly destroyed the interior of the building some short time back. Architects have been invited to send in designs for the new building, and at a meeting of the committee on Monday last they chose the design sent in by Mr. G. W. Bradford, and appointed him their architect for the new building. The new church will be of a plain Gothic character, and will consist of nave, with aisles at each side, tower at the west end, two transepts, ministers' and deacons' vestry, and gallery at one end, accommodation being provided for 500 persons.

PROVINCIAL NEWS.

Boole.—On Monday last Beaconsfield Hall and other premises intended to serve as a Conservative Club House, in Pembroke-road, Boole, were opened by Sir R. A. Cross. The premises are approached from Pembroke-road by two entrances, admitting into two entrance-halls. That to the right will be used for the stage, hall, and committee-rooms, and also for special entrance when the club is in occupation. The entrance on the left is for the use of the club proper, and also for the hall above. On the ground floor there is a large reading-room, dining-room, and billiard-room. There are also ante-rooms, lavatories, &c. In the rear of the building is a kitchen, with scullery, larders, &c. There is a staircase to the basement floor from the entrance hall, and on this floor are provided rooms for the Conservative Working Men's Association, with spacious cloak-room, lavatories, &c.; also billiard-room for two tables, and dining-room, capable of accommodating 200 persons. On the mezzanine floor are provided retiring-rooms, lavatories, &c. On the first floor there is an entrance through swing doors to a large assembly room 90 ft. 6 in. by 40 ft.,

and 30 ft. high. This hall is capable of seating about 930 persons, and has a large stage provided at the south end. At the opposite end is provided a gallery along the full width of the building, capable of seating 290 adults. The ceiling of the hall is elliptical in form, and the acoustic qualities are said to approach perfection. There is provided under the gallery a large crush-room and ladies' retiring-room. With regard to the question of ventilation, which has been well considered, the extractor in the roof has been provided by Messrs. Kershaw, of Lancaster. The main outlet is 35 in. in diameter, and is connected by a channel to open ornamental gratings in ceiling. The principal facade towards Pembroke-road is designed in the Jacobean style of architecture, with an admixture of German Renaissance. It is faced with Edwards's "pressed bricks" from Ruabon kilns, and red stone dressings. The roof is steep pitched and covered with Nendallton slates, with lead hips, terminals, &c. The building has been erected by Messrs. Bell & Burnie, contractors, Keble-road, Bootle. The heating-apparatus was supplied by Mr. I. A. Buck; the ventilation and all other matters have been superintended by the architect. The furnishing is being carried out by Messrs. Ramney & Love, Bold-street. The building has been designed and erected under the superintendence of Mr. Thomas Cox, of Cook-street, Liverpool.

Abergavenny.—The extension of the Joint Counties Asylum, Abergavenny, has now been completed. The contract with Messrs. Horsman & Co. to carry out the buildings was 42,000*l.* The laundry is a spacious building, having a general washhouse, 80 ft. by 25 ft., well lighted and ventilated, and fitted up with rinsing and soaking tanks, steam boiling-coppers, a large-sized hydro extractor, and a Bradford's washing-machine; in close connexion with these are two sets of drying-houses, containing twenty in each, heated by steam coils, the waste heat being utilised in a room formed over these for the purpose of drying beds, &c. There is also a smaller washhouse for foul linen. The machinery is driven by a Tange Bros.' 10-h.p. double standard vertical engine, connected to horizontal shafting fixed in a brick-built subway running along under the floor of the wash-houses. Under the laundry washhouse is a tank, built to contain 120,000 gallons, which receives the rain-water from most of the buildings around. The whole of this machinery has been supplied and fixed by Messrs. J. & F. May, engineers, of High Holborn. The boiler-house contains three single-tube Lancashire boilers, 18 ft. long and 6 ft. diameter, with Galloway tubes. The dining-hall is 107 ft. long, 50 ft. wide, and 24 ft. to the roof-plate. The hall is lighted by a spacious lantern, with sashes all round, some of which are hung on centres, and opened and closed by connecting rods and screw gearing, 6 ft. above the floor. The hall is lighted at night by two star lights of sixty burners each, and fourteen brackets of three burners to each. All the woodwork is executed in pitch-pine, and varnished. There are no fewer than eleven entrances to the room, six of which have wide double doors. Upstairs, the room which was formerly used as a chapel has been altered into two rooms, namely, the board-room and the committee-room. The kitchen, which is conveniently near the dining-hall, is a commodious apartment, fitted up with the latest and most approved cooking apparatus. The steward's room, containing the stores, is a large room, with a gallery and side shelves for stores. The steward's office is divided from the rest of the room by a glazed division, the clerk's office being similarly formed on the other side of the room. From this room a door opens into the baker's bread-room. A door from this room opens into the bakehouse itself. The ovens are capable of holding 200 four-pound loaves at one batch. The lavatories and water-closets have all the fittings of modern and approved descriptions. The chapel is built of Giltworn stone, with Bath stone dressings. All the woodwork is executed in pitch-pine, and varnished. There are 550 sittings, the aisles, chancel, and communion being executed in encaustic tile paving. The building is heated by hot air from a chamber under the vestry. The architects were Messrs. John Giles & Gough, of 23, Craven-street, Charing-cross; and Mr. Thomas Gamage, of Holloway, London, has been the clerk of works, and has rendered valuable assistance in carrying out the minor details and requirements of the medical staff. The contractors were Messrs.

P. Horsman & Co., of Wolverhampton, Mr. A. Smith, being their foreman of works. The whole of the locks have been made *en suite*, with master-keys to pass, similar locks being fitted to the existing doors in the old waide, and were supplied by Messrs. Hobbs, Hart, & Co., of Cheapside, London. The ovens in the bakery were built by Messrs. Smith & Son, of York-road, Lambeth.

Books.

Practical Geometry and Engineering Drawing.
By GEORGE SYDENHAM CLARK, Captain Royal Engineers. Second edition. London: Spon.

This work appears to comprise the course of drawing practiced at Cooper's Hill Schools. It is of an elementary character, carrying the student little beyond the orthography of the art. It is accompanied by some good advice in the selection of the best materials and tools necessary to the art, which will be found useful to the beginner. The art of drawing bears much the same relation to the duties of an advanced draughtsman that penmanship does to the literary man, giving to him merely the power to convey his ideas to others. An author may be very accomplished, though it puzzles the printer to decipher his writing. So it is better to produce a rough sketch of good architectural design, or good engineering work, than an elaborate drawing bad in design, or representing faulty construction. In this respect architectural and engineering drawing differs entirely from the work of the artist. The painting finished, the artist's work is done. The engineer's drawing is but preliminary to the commencement of the work.

Perhaps the most useful application of accurate drawing is to the solution of mechanical problems, which, from their irregularity and complexity, defy any other process; that shows how proper clearance is to be attained in machinery in motion, and determines the strains on structural forms. Not that slovenly drawing is ever desirable, but that beauty in a drawing should always be sacrificed to utility, except where beauty is the end to be attained, as in architectural elevations, &c. The author claims that care has been bestowed on the plates, that they may be, as far as possible, examples of drawing, and justly remarks that, by a strange irony illustrations to works of the kind are too often more fitted to serve as warnings than as guides to the student.

The illustrations have certainly not escaped the usual irony, at least as far as the curves are concerned. Most of the ellipses may serve as warnings to the student. Out of some twenty or more illustrated there are only two or three which would pass muster if examined by an experienced draughtsman. They appear to have been built up of circular arcs, and the positions of the centre often badly chosen. The usual too familiar result has necessarily followed. Where, however, the figures are formed of straight lines they are very good, and the perspective illustration is excellent. The examples of sciography are of a very elementary description, and will afford little assistance to the architectural draughtsman in the complex cases which he continually encounters.

As a text-book this work will be found useful to the young beginner, more especially the chapter on Perspective, and the generally good advice given for the selection of instruments, and for the manipulation of materials. The plates in this edition are bound separately, a form more convenient for reference while reading the text, but rather inconvenient for the library when bound in volumes differing so much in size. The class questions and examples are numerous and well selected, and will afford good practice to the more advanced student.

Wood Block Flooring.—We hear good reports of the improved wood-block flooring patented by Mr. Lowe, of the Cement and Wood Pavement Works, Farnworth. The wood blocks, long and narrow, are laid in a patent preservative composition, on a floor composed of a system of iron beams and cross joists combined with cement concrete. A correspondent states that in his warehouse heavy goods have been trucked over a space (5 ft. wide) of this flooring for two years and a half without the displacement or damage of a single block.

MEETINGS.

SATURDAY, JAN. 19.

Artisans' Technical Association (1, Adam street, Adelphi). Paper by Mr. A. Harland, A.R.I.B.A. 8 p.m.

MONDAY, JAN. 21.

Royal Institute of British Architects.—Col. the Hon. A. Parnell (late R.E.), on "The Action of Lightning Strokes in regard to the Metals and Chimneys of Buildings." 8 p.m.

Royal Academy.—Mr. J. E. Hodgson, R.A., on "Art as influenced by Michelangelo." 8 p.m.
"Ornament."—Mr. H. H. Statham, on "Ornament." 5 p.m.

TUESDAY, JAN. 22.

Surveyors' Institution.—Students' Preliminary Examination.

Institution of Civil Engineers.—Mr. William Hackney, R.S., Assoc.-M. Inst. C.E., on "The Adoption of Standard Forms of Test Pieces for Bars and Plates." 8 p.m.

Royal Institution.—Mr. Reginald Stuart Poole on "The Study of Coins and Medals." 8 p.m.

WEDNESDAY, JAN. 23.

Surveyors' Institution.—Students' Preliminary Examination (continued).

Society of Arts. Mr. William Lant Carpenter, R.A., on "Science Teaching in Elementary Schools" (Sir John Lubbock in the chair). 8 p.m.

THURSDAY, JAN. 24.

West London School of Art.—Presentation of Prizes, and Address by Mr. J. Comyns Carr. 8 p.m.

Society of Antiquaries.—(1) Major Cooper, F.R.S., "On a Saxon Interment in Toddington Parish, Beds"; (2) Mr. Aug. W. Franks, F.R.S., and Mr. C. S. Percival, LL.D., "On a Collection of Italian Seal-boxes and Matrices of Seals exhibited by permission of the Duke of Buccleuch." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section). Professor Wanklyn on "The Manufacture of Gas from Lined Coal." 8 p.m.

London Institution.—Mr. W. A. Barrett on "Mozart's Operatic Works." 7 p.m.

FRIDAY, JAN. 25.

University College.—Professor C. T. Newton on "Lycian Rock Tombs." 4 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. James Johnstone Bourne on "The Expenditure of Power in Steamship Propulsion." 7 p.m.

SATURDAY, JAN. 26.

Architectural Association.—Visit to the New Council Chamber, Guildhall, and new offices in Lime-street. Assemble in Guildhall at 3 p.m.

Miscellaneous.

Electrical Engineering.—The second of a course of lectures on "Electrical Engineering," by Mr. Jno. C. Fell, M.I.M.E., &c., was delivered on the evening of January 14 in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. T. Hovenden, member of the council, in the chair. The lecturer commenced with an explanation of the generation of a galvanic electrical current from chemical reaction, explaining clearly the chemical changes taking place in the cell. The lecturer then gave a very useful list of the chief commercial galvanic batteries at present in use, with details of the various positive and negative elements.

An explanation of the formula $Q = \frac{E}{R}$ followed with its various adaptations to alternative combinations of batteries in partial series and partial parallel arc. The comparison between single and double celled batteries was fully gone into, and the effect of the double cell on increased internal resistance was clearly explained. The practical adaptation of batteries to electrolysis, electro-plating, or lighting purposes was fully discussed, and the lecture terminated with some new theoretical views expounded by the lecturer upon the value of dispensing as far as possible with internal fluid resistance.

City of London College.—Of the thirty-four students from the City of London College, who sat for the Building Construction examination of the Science and Art Department in May last, not one failed. Two passed in honours, thirteen in the advanced stage, and nineteen in the elementary stage; there were eleven first-class certificates. The only failures in ten years have been eight honours, one advanced, and six elementary, out of 211 students examined; or an average success in all stages of ninety-three per cent., whereas the general average of the kingdom is under sixty per cent.

The Weather and the Public Health in 1883.—In view of the satisfactory condition of the public health in 1883, judged by the national death-rate, which, so far as is at present known, did not exceed the low rate of 19.5 per 1,000, it is interesting to consider one or two of the principal meteorological features of the year derived from daily observations at the Royal Observatory, Greenwich. The mean temperature of the year was 49.3°, against 48.9° and 49.7° in 1881 and 1882, and was 0.8° above the average mean in 100 years. Compared with the same mean standard, February was exceptionally mild, and March as exceptionally bleak and cold. The mean temperature of August showed an excess. With these exceptions the monthly mean temperature differed but slightly from the averages. The only marked effects produced by the temperature was a considerable temporary increase of mortality due to the cold March, which more than balanced the favourable effect of the mild February; and a sudden increase of infantile diarrhoea fatality, due to the excess of temperature in August. The temperature of each of the last four months of the year being slightly above the respective average, undoubtedly conducted to the low mortality of the last quarter of the year. Rain was measured at Greenwich, on 173 days in 1883, to the aggregate amount of 21.9 in., showing a deficiency of 3.4 in., compared with the average amount in sixty-one years. The deficiency of rainfall was most marked in March, August, and December; whereas the months showing the largest excess were February and September. The amount of bright sunshine recorded in the year was 1,241 hours, differing but slightly from the amount in each of the five preceding years, excepting only 1879, when the amount fell to 983 hours. The sunshine exceeded the average in August, but showed a marked deficiency in December. The weather in 1883 was, on the whole, fairly favourable to health, being free from severe frost in winter and from excessive summer heat. It is, however, mainly to other causes that we must look for an explanation of the low death-rate of the year.—*The Lancet.*

New Altar and Reredos, Great Grimsby. A new altar has just been erected by the Hon. Mrs. Fraser, in the Chantry Chapel of the Sacred Heart, in the R.C. Church of St. Mary, Great Grimsby. In the centre of the reredos is a statue of Our Lord, in a niche with octagonal canopy, a perforated tracery spire, with crocketed gables, pinnacles, finials, and supported on either side by statues of St. Mary Magdalen and St. John the Beloved, in their niches, standing on a richly-carved projecting bracket and canopies, supported by marble shafts, and finished by an elaborate carved and perforated cresting. The altar front is deeply recessed, having three moulded panels; the centre one contains a carved monogram of the Sacred Heart, with a crown of thorns and rays of light, and on each side are sculptured angels in adoration. Above the altar is the Tabernacle, terminating with a crocketed gable richly carved and supported on marble columns. On each side is a marble super-altar, behind which are richly-moulded panels with inlaid marbles. The centre portion of the architects' design only is now erected, but when complete the reredos will be continued on each side of the chapel. The whole is from the designs of Messrs. Pugin & Pugin, of London and Ramsgate, and executed by Messrs. Boulton & Sons, the well-known architectural sculptors, of Cheltenham.

Lectures on Architecture and Sculpture at the Royal Academy.—The following courses of lectures to the students of the Academy have been arranged for: *Architecture*: Feb. 7 and 14, "Ancient Egyptian Architecture," by Mr. R. Stuart Poole; Feb. 18, "Colour applied inside Buildings: Marble and Mosaic," and Feb. 25, "Stained Glass and Painting," by Mr. George Aitchison, A.R.A. *Sculpture*: Feb. 21, "On the Monuments of Ancient Art which have been discovered between the time of Winckelmann and 1850," by Mr. C. T. Newton, C.B.; Feb. 28, "On the Monuments of Ancient Art which have been discovered since 1850," also by Mr. Newton. Mr. Poynter, R.A., will lecture on "Sculpture" on March 3 and March 10.

Technical Schools at Nottingham.—The Technical Schools in carpentry, lacing-making, &c., in connexion with the University College, Nottingham, will be formally opened by Sir Frederick Bramwell on the 24th inst.

Celtic and Roman Britain.—An interesting lecture on this subject was delivered on January 10, before a crowded theatre at the London Institution by Mr. Alfred Tylor, F.G.S. It was illustrated by numerous drawings of remarkable antiquities. Some of them bore Eastern symbols, others were purely Roman in character, others again of British origin. Besides a number from Lydney, they mostly belonged to the Roman remains beneath Warwick-square, explored by the lecturer himself, or to the magnificent Roman villa with its appendages which have been so thoroughly excavated during the last years near Brading by the Messrs. Price. It was pointed out that these Roman remains illustrate the little-known rites of the Persian Sun-god Mithra, whose mysteries were introduced into Italy about the beginning of the Christian era. Mr. Tylor's lecture on this subject at the Royal Institution will be remembered by those who heard it. Mr. Tylor had prepared a map of all the Roman roads which are still in use as great trade highways at the present time, and he pointed out how large a number of them converged at Winchester (Venta Belgarum), which was evidently used as a general *entrepôt* for conveying the metallurgical products of Britain to the Continent. So many British sepulchral mounds were to be found on some of these routes that they must have been chariot or horse routes centuries before the Roman occupation of our island. Then from Winchester the tin, iron, and lead from Cornwall and Wales could be carried to Beaulieu, thence eight miles to Stansore Point, a name etymologically connected with the word *stannum*, tin,—in the fife of Wight, whence there was an easy road to Brading, a very safe port. The lecturer went on to refer to the Celtic invention of the well-known Ogham characters,—an achievement which he thought correspondent with the high metallurgical and artistic skill shown in ancient Celtic jewellery.

Train Lighting by Direct Electricity.—In the few examples of railway-carriage lighting by electricity which have hitherto come under our notice, batteries, either secondary or primary, have formed the sources of the illuminating power. Recently, however, an experiment in train lighting by direct electricity has been successfully made, and is being continued on the Metropolitan District Railway in connexion with one of the suburban trains running from High-street, Kensington, to Putney. In carrying this out, a Siemens dynamo and a Williams three-cylinder engine are placed in a luggage-van which is attached to the train. In the van is also a small boiler from which steam is supplied to the engine. The carriages are lighted by means of a total of twenty-eight Swan incandescence lamps of twenty candle-power each, which give a very brilliant light. The present machinery was designed for a longer train, and, in addition to the lamps in the carriages, there are about thirty in the van, which are always lighted when the others are. The object of this is to ascertain the exact cost of working a sufficient number of lights for the longer trains, which are usually fitted with fifty ordinary gas-lamps. The results of the trial of the light so far are considered very satisfactory.

Bispham.—The unveiling of the stained-glass window presented to the new church at Bispham, near Blackpool, by the Freemasons of the Fylde, will take place on the 25th inst. The ceremony will be performed by Bro. the Earl of Lathom, D.G.M., and Prov. G.M. of West Lancashire. The subject of the central compartment of the window is "The Good Samaritan," with the text, "Go thou and do likewise," on a rich ornamental base. In the opening on the left is Abraham's intended sacrifice of Isaac, with the text, "Lay not thy hand upon the lad"; and the right opening is filled with King Solomon kneeling before the altar, and dedicating the temple to the worship of Jehovah, with the legend, "Hearken Thou to the supplication of Thy servant." These subjects are all surrounded by rich foliated canopies on a ruby ground, and at the bottom of the window is an inscription recording the gift of the window, which has been executed by Messrs. Ward & Hughes, Frith-street, Soho-square.

St. Mary's Church, Far Cotton.—A contract has been entered into for the erection of a permanent building for 3,340l. The architect is Mr. Holding, of Northampton.

The Wilberforce Statue at Hull.—The Townhall of Hull has just received an addition to its collection of marble statues of the town's departed worthies, in the gift to the Corporation, by Mr. Henry Briggs, ex-Sheriff, of a heroic figure of William Wilberforce, the Emancipator. The statue is the work of W. Day Keyworth, jun. The likeness shows Wilberforce in advanced years. The statue was unveiled on Tuesday last by the Bishop of Newcastle.

Denmade.—The first of a series of contemplated windows has just been erected in All Saints' Church, Denmade, Hants. It consists of two lights, representing the "Walk to Emmaus" and the "Ascension." The artists are Messrs. Mayer & Co., who have prepared designs for all the windows in the church.

TENDERS.

For rebuilding the Freemasons' Hall, Great Queen-street. Mr. Horace Jones, architect. Quantities by Messrs. Reddall & Son:—

Holland & Hannen	£3,583 0 0
Perry & Co.	5,380 0 0
Axford	5,200 0 0
Lascelles	5,160 0 0
Chappell	5,120 0 0
Colts & Sons	5,081 0 0
Nightingale	4,881 0 0
Boyce	4,680 0 0
Corder	4,500 0 0
Macey & Sons	4,313 0 0

* We are informed that this tender, with two others, was rejected in consequence of alteration in form of tender.

Tenders for sewerage, level ling, kerbing, metalling, and making good two of the streets within the Finchley district for the Finchley Local Board. Mr. George W. Brunell, surveyor:—

	Brownlow Road.	Gruncien Road.
H. J. Shepherd	£628 7 0	£28 7 0
McKenzie Williams & Co.	441 0 0	444 0 0
P. G. Pound	427 0 0	427 0 0
J. Pizzev	393 0 0	400 0 0
Noyes & Robson	387 0 0	387 0 0
G. Bell	378 0 0	378 0 0
T. Adams	359 0 0	369 0 0
J. Botterill	353 0 0	353 0 0
J. Schofield	315 17 3	315 17 2
Wm. Lloyd, Kilburn Park	289 15 0	289 15 0

* Accepted.

For new warehouses, Nos. 10 & 11, Little Trinity-lane, London. Mr. H. H. Collins, architect, 61, Old Broad-street:—

Ookenden	£2,593 0 0
Boyce	2,283 0 0
Asbly & Horner	2,237 0 0
Morter	2,254 0 0
Colls	2,219 0 0
Downs	2,169 0 0
Shepherd	2,177 0 0
Roberts	2,173 12 0
Greenwood	2,129 0 0
Croaker	2,024 0 0

For alterations and additions to the Norwich Medical Institute. Mr. A. F. Scott, architect, Norwich. Quantities supplied:—

T. C. R. King	£483 0 0
W. Jernyn	457 0 0
W. E. Bailey	387 0 0
R. W. Daines	387 0 0
W. North	393 0 0
R. W. Bennett	393 0 0
S. Bloy & Co.	382 10 0
J. Barnard	384 0 0
J. Hurn	378 0 0
J. W. Lacey	370 0 0
S. Chapman	369 0 0
T. W. Kund	358 0 0
J. Young & Son	349 0 0
N. Hurn	340 0 0
G. Hammond	310 0 0
E. C. Ceeks (accepted)	3,314 0

For rebuilding draper's shop, for Mr. W. Hott (late destroyed by fire), Bridewell-lane, Norwich. Mr. A. F. Scott, architect. Quantities supplied:—

J. Hurn	£283 10 0
R. Wegg	646 0 0
T. W. Rutland	650 0 0
H. Lacey	650 0 0
S. Bloy & Co.	621 0 0
J. Young & Sons (accepted)	595 0 0

For additions and alterations to No. 10, Trinity-square, Tower Hill, E.C. Mr. Jason Cutler, surveyor:—
Holmer & Co., Holborn (accepted) £296 0 0
(No competition.)

For the construction of stoneware and iron pipe sewer in Marsh Gate-lane, and the Pudding Mill river, Stratford, for the West Ham Local Board. Mr. Lewis Angell, engineer. Quantities by Messrs. H. L. Curtis & Son:—

Munday & Son	£3,989 0 0
Bottoms	2,649 0 0
Jackson, John	2,665 0 0
Botterill, J. W.	2,568 0 0
Wise & Wilson	2,550 0 0
Adams	2,450 0 0
J. W. & J. Neave	2,374 0 0
Standen	2,350 0 0
J. Bell (accepted)	2,200 0 0
Burling & Co.	2,187 0 0

For the erection of a villa residence in Burleigh Park-road, Addlestone, for Mr. Thomas Wedgwood Wedgwood, J.P. Mr. Charles Webb, Chertsey, architect and surveyor:—
James Harris £1,801 0 0
James Martin 1,713 0 0
Richard J. Hunt (accepted) 1,639 0 0

For the erection of a school in Brecknock-road, Camden Town, for the London School Board. Mr. E. R. Robson, architect:—

Turtle & Appleton	£4,265 0 0
Goodman	3,773 0 0
Roberts	3,767 0 0
Reading	3,739 0 0
Williams	3,570 0 0
Stimpson	3,583 0 0
Smith	5,545 0 0
Survener	3,923 0 0
Shurmer	3,492 0 0
Bangs	3,392 0 0
Atherton & Latta	3,290 0 0
Patman	3,285 0 0
Brass	3,270 0 0
C. Wall	3,250 0 0
Jerrard	3,210 0 0
Wall Bros.	3,195 0 0

For the erection of schools in the Malmesbury-road, Old Ford, for the London School Board. Mr. E. R. Robson, architect:—

Johnson	£13,651 0 0
Goodman	13,432 0 0
Pritchard	12,725 0 0
Kirk & Randall	12,724 0 0
Hook & Co.	12,677 0 0
Gentry	12,630 0 0
Patman	12,588 0 0
Smith	12,515 0 0
Wood	12,490 0 0
Bangs	12,475 0 0
Lawrence	12,417 0 0
Grover	12,325 0 0
Stimpson	12,251 0 0
Oldrey	12,239 0 0
Boyce	12,216 0 0
Brass	12,200 0 0
Wall Bros.	12,196 0 0
C. Wall	12,168 0 0
Cox	12,144 0 0
Atherton & Latta	12,100 0 0
Shurmer	11,889 0 0
Jerrard	11,914 0 0
Perry & Co.	11,868 0 0

For the erection of a school in the Smeed-road, Old Ford, for the London School Board. Mr. E. R. Robson, architect:—

Johnson	£15,639 0 0
Wood	15,303 0 0
Boyce	15,180 0 0
Pritchard	15,165 0 0
Kirk & Randall	15,093 0 0
Gentry	14,981 0 0
Goodman	14,900 0 0
Patman	14,842 0 0
Lawrence	14,580 0 0
Grover	14,457 0 0
Bangs	14,310 0 0
Hook & Co.	14,296 0 0
Oldrey	14,231 0 0
Brass	14,214 0 0
Smith	14,170 0 0
C. Wall	14,118 0 0
Gentry & Co.	14,113 0 0
Jerrard	14,053 0 0
Cox	14,080 0 0
Atherton & Latta	14,000 0 0
Shurmer	13,986 0 0
Wall Bros.	13,940 0 0
Perry & Co.	13,845 0 0

For building new schools at Grange road, in the South-west Division, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. T. Thornton Green:—

Appleton	£12,573 0 0
Johnson	11,544 0 0
Lathey Bros.	11,243 0 0
Marshall	11,220 0 0
Downs	11,180 0 0
Shepherd	11,111 0 0
Lawrence	10,936 0 0
Bangs	10,910 0 0
Ton-que	10,905 0 0
Hook	10,854 0 0
Perry	10,833 0 0
Patman	10,833 0 0
Grover	10,823 0 0
Cox	10,800 0 0
Brass	10,800 0 0
Atherton & Latta	10,750 0 0
Wall	10,750 0 0
Smith	10,755 0 0
Hart	10,690 0 0
Stimpson	10,539 0 0
Wall Bros.	10,521 0 0
Kirk & Randall	10,459 0 0
Jerrard	10,439 0 0
Oldrey	10,395 0 0

For the first portion of new schools at West Silver-town, for the West Ham School Board. Mr. J. T. Newman, architect, 2, Fen-court, Fenchurch-street, E.C. Quantities by Messrs. Curtis & Sons:—

Holland	£5,485 0 0
Priestley & Gurney	5,053 0 0
Lake & Co.	4,990 0 0
J. Brickell	4,978 0 0
North Bros.	4,913 0 0
C. H. Hunt	4,846 0 0
R. E. Nightingale	4,844 0 0
C. Cox	4,799 0 0
Hearle & Son	4,793 0 0
J. Catley	4,774 0 0
G. J. Hoskings	4,767 0 0
A. Reed	4,753 0 0
W. Shurmer	4,681 0 0
Parfett	4,566 0 0
Hewell & Son	4,530 0 0
Magee & Co.	4,527 0 0
W. Wreger	4,068 0 0

For the erection of two villas in Burwood Park-road, Waltham-on-Thames. Mr. Charles Welch, architect and surveyor:—

S. Woods	£1,129 0 0
F. Peters	1,120 0 0
R. J. Hunt	998 0 0
J. F. Frieley	885 0 0
J. Martin (accepted)	182 0 0

For the construction of a new sewer for the drainage of South Ritham, for the Metropolitan Board of Works. Sir J. Bazalgette, engineer.—

Bottoms Bros.	£39,970	0	0
Pearson	34,890	0	0
Beadel Bros.	33,174	0	0
Nowell & Robson	32,750	0	0
Neave	32,500	0	0
Williams & Wallington	31,200	0	0
Killingback	29,600	0	0
Ford & Everett	29,600	0	0
Webster	28,300	0	0
Hill Bros.	27,432	5	3
Mowlem & Co.	26,314	0	0
Kellett	23,500	0	0
G. Stevenson	19,998	0	0

* Accepted, subject to inquiries.

For the erection of an infants' school, Crockett's-lane, Smithwick, for the Harborne School Board. Messrs. J. P. Sharp & Co., architects, 46, Chery-street, Birmingham.—

G. H. Marshall	£3,288	0	0
J. Garlick	3,200	0	0
Harley & Son	3,098	0	0
H. Smith & Son	3,055	0	0
Whitehouse & Jones	3,039	0	0
Jeffery & Son	2,900	0	0
Walton Bros. (accepted)	2,895	0	0

For "barrack" buildings (exclusive of seating and lighting), and allowing for old materials, the Salvation Army, on the site of the Royal Oak, Park-street, Leamington. Mr. E. J. Sherwood, architect, 101, Queen Victoria-street, London. Quantities supplied.—

Garlick, Birmingham	£2,650	0	0
G. F. Smith, Milverton, Leamington	2,181	0	0
W. Robbins, Coten Rod, Warwick	2,070	0	0
J. Inwood, Malvern (too late)	2,045	0	0
J. Fell, Leamington	2,012	0	0
W. Lessman, Leamington	1,940	0	0
W. Griffin, Corpe Hills, Wimbourn	1,921	0	0
T. Bailey, Leamington	1,733	0	0
W. Gascoyne, Leamington	1,729	0	0

For the erection of engineering works, Bute Dock, Cardiff, for the Walstead Shipway and Engineering Company (Limited). Quantities by Mr. S. Rooney, Cardiff.—

C. Shephard, Cardiff (accepted)	£7,200	0	0
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For the erection of stables in George-street, Camberwell. Mr. James W. Irwin, architect, 10, St. James-street, E.C. H. Burman & Sons, Kennington (accepted) £164

For making new roads and surface water drains on the Beach Hill Park Estate, Hadley.—

Mariotti, Tottenham	£6,439	0	0
Wilson, Walthamstow	6,282	0	0
Dummers, Hornsey	6,069	0	0
Pinney, Hornsey	6,059	0	0
Harris, Camberwell	6,320	0	0
Lloyd, Kilburn	4,798	0	0

For drainage works, Great Yarmouth. Contract "D." Mr. J. Wm. Cockrill, Borough Surveyor.—

Cook, Bennett, & Thew, Spalding	£2,499	0	0
Beaule Bros., Brith, Kent	2,470	0	0
Neave, London	2,466	0	0
Want, Yarmouth	2,399	10	0
T. Cobham, Newark	2,257	0	0
R. Nudd, Yarmouth	2,227	9	6
Downing, Norwich	2,100	0	0
Botterill, London	2,089	0	0
Harbert, Yarmouth	1,933	0	0
W. Wood, Chelmsford	1,970	0	0
Cork & Beech, Yarmouth	1,810	0	0
Cowdery, Newent, Gloucestershire	1,788	0	0
Bennett, Ipswich	1,720	0	0
Gibson, Exeter	1,710	0	0
J. Hayward, Rastbourne (accepted)	1,655	0	0
R. Nicholson, Brentwood	1,561	10	6

[Surveyor's estimate, £1,850.]

For erecting roof over purifiers at the Sevenoaks Gas Works. Mr. A. Penny, engineer.—

Punnett	£496	0	0
Constable	490	0	0
Wiltshire	480	0	0
Durtell	359	0	0

For erecting eight villa-residences at Bitchington Bay Estate, Kent, for the Bitchington Bay Estate Company (Limited). Mr. E. C. Homer, architect, Mansion House Chambers.—

Waterman (accepted)	£2,700	0	0
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For footpath improvements for the Beckenham Local Board. Mr. Geo. B. Carlton, Assoc.-Mem. Inst. C.E., engineer and surveyor.—

Allred & Co., Hammer-smith	£9,742	11	4
Wheeler & Hindle, Bankside	9,023	4	3
J. Gabriel, Lambeth	8,868	19	2
Amrose & Son, Bath	8,853	2	3
The Victoria Stone Company, Kingsland-road	8,334	16	3
Hill Bros., High Wycombe	7,741	3	4
T. Free, High Wycombe	7,893	9	11
C. Hunt, High Wycombe	7,640	4	10
Woodham & Fry, Greenwich	7,337	2	2
A. Palmer, Birmingham	7,287	7	6
J. Mowlem & Co., Westminster	7,264	6	3
Kellett & Bentley, 4, Queen Victoria-street	6,948	1	0
E. & W. Iles, South Wimbles	6,615	15	5
G. B. Marshall, Brighton	5,871	18	8

[Engineer and surveyor's estimate, 7,249. 6s. 3d.]

For additions to the Waverley Hotel, Clacton-on-Sea. Mr. Charles Bell, architect, Dashwood House, New Broad-street. Quantities by Mr. H. Lovegrove, 28, Budget-row.—

Foster & Dicksee	£3,799	0	0
Porter	3,768	0	0
Saunders	3,667	0	0
Martin	3,667	0	0
Wood	3,480	0	0
Gillingham	3,445	0	0
Brown	3,398	0	0
Everett	3,340	0	0
Gibbons	3,300	0	0

TO CORRESPONDENTS.

T. B. (too late).—H. J. (received).—F. W. R. & Co. (cannot return to the subject).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline relating out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the author.

We cannot undertake to return rejected communications. Letters or communications, styled more news items, which have been duplicated in other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement last week, and a COLOURED TITLE-PAGE is issued with this number, in substitution for that published previously.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each, also.

READING-CASES (Cloth), with strings, to hold a Month's Numbers, price 3s. each, also.

THE FORTY-FIFTH VOLUME of "The Builder" (bound), is now ready, price 7s. 6d. each, and is sent to the Office, will be bound at a cost of 2s. 6d. each.

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PERSONS advertising in "The Builder," may have their ads. addressed to the Office, 46, Catherine-street, Covent-garden, W.C. free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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Terms for Series of Trade Advertisements, also for Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

FOUR Lines (about thirty words) or under 3s. 6d. Each additional line (about ten words) 1s. 6d.

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Corsham Down, And Farleigh Down.

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Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.

The Builder.

VOL. XLVI. No. 2388.

SATURDAY, JANUARY 25, 1884.

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Contemporary Russian Architecture.

THE year 1883 will not be distinguished among the years of architectural activity in Russia. Indeed, scarcely any new edifice of importance has been erected, and no new additions have been made to those splendid monuments of what must be considered a moribund style, Byzantine church architecture. Some of the Byzantine churches in Moscow, for instance, are indeed worthy representatives of a religion remarkable for its antiquity, the grandeur of some of its tenets, and the gorgeousness of its memorials. There is a massive beauty about these churches which no one who has not seen them can form an idea of. The imagination of the human mind is too weak to be able to conjure up from the dead lines and shades of drawings a complete picture of a Russian church in all its magnificence. Coloured illustrations even must fail to produce a correct impression. Thoroughly to realise a truly Russian church, one must see it,—see it in all the glory of its surroundings, the golden cupolas dazzling in the deep blue sky, and resplendent with the intense rays of the noonday sun, the bright colours of the walls and pillars standing out in glaring contrast with the beautiful whiteness of that everlasting placid winter snow. Or else see it in the mysterious shimmer of a moonlight night, when the sledge crackles over the crisp snow as it carries the traveller along, and when the tall belfry, with its cruciform spires, rises solemnly into the silent sky, standing like a sentinel guarding the sacred spot behind it, on which the massive columns and dark, weird, carved walls stand in humble grandeur, the fitting representatives of that Christian religion or the observance of which they were erected. Notwithstanding the truly national tone of these churches, the endless variety of form of which they are capable (there are no two churches alike), it is a somewhat humiliating reflection to think that the greatest ecclesiastical architect of Russia was a Florentine. So it was, however, and so it is even now.

Foreigners do a surprisingly large amount of the work of the country. A striking instance is offered by the example of Odessa, which town has at last decided to erect a municipal theatre, and has entrusted the design to a firm of Viennese architects. It may be stated that the project of building a theatre for the entertainment of the citizens of Odessa has occupied the minds of the sage members of the municipality for the last ten years, and has not yet attained a satisfactory stage, nor is it likely to do so. For, though the design has been sent in, and the drawings accepted, it is now found impossible to get any one to undertake to carry out the work. The terms of the contract are, perhaps, a little hard, but still the fact remains, that the only contractor who has come forward at all is a German, and he demands a larger sum than the municipality feel justified in according to him. The question of the amusement of the inhabitants of Odessa will, therefore, be probably again shelved, and the drama, the votaries of which had been hoping against hope, continues to slumber in one of the largest towns of the Russian empire. The difficulties of Odessa are not yet ended, however. The town has been enriched with a public library. This library has been erected, from the designs of a Russian architect, on the site of the old historical and archaeological museum, the two institutions being now embodied in one building. The consequence of this arrangement is that the space available for the library is small indeed, one hall and two rooms being devoted to it. Two months after the institution had been opened to the public it became necessary to restrict its use to those who had passed the age of sixteen, and, as the crowd shows no signs of diminishing, the idea is seriously entertained of forbidding the aged to frequent it. The day may not be far distant when it will become necessary to turn out the books as well. Private houses in this architecturally unhappy town show a remarkable tendency towards originality. The fact is, houseowners like to be their own architects, and stamp their creations with the marks of their genius. Some of the houses do not gain either in stability, hygiene, or beauty by this system, and indeed there is a municipal regulation to the effect that no house shall be built in the town the plans of which are not signed by a technical man. But this law is easily evaded, as, we regret to say, there seem to be professional men in Odessa who will put their name to anything—for a consideration.

If the building achievements and prospects of Odessa are not brilliant, those of Warsaw stand out in greater lustre by the contrast. The capital of Poland is making rapid strides, and is fast becoming a European town of the first magni-

tude. Within the last few years it has manifested a remarkable activity, and everywhere the traveller sees springing up fine, many-storied houses, of handsome proportions and elegant design. Perhaps the town has arrived at its full growth, and is not capable of further expansion, being hemmed in by the Alexander citadel on the north, the Visla on the east, and prevented from extending in the west by the remoteness of the centre from this part. In the south, however, a good deal may still be done. The suburb of Pola has already been joined to the town, and now forms one with it, and this neighbourhood, which was once a dreary and unsightly region of wooden sheds and straggling houses, is now being rapidly converted into one of the handsomest portions of the town. It is favourably situated, near the Botanical Gardens and the famous Lazenkovsky Park. Warsaw is laying down a network of tramways, and among the projects of the immediate future is a drainage scheme, a report on which has already been issued in the Russian and Polish languages by an Englishman, Mr. Lindley, the municipal engineer. But even here Momus need not be idle. The only source of water-supply is the Visla, a fine, broad river, but, unfortunately, very polluted. A glass of pure water is an unheard-of luxury, and the inhabitants are vainly longing for the day when they will again be able to relish their tea, and when typhoid fever shall be less common. The town of Saratoff, wishing, probably, to show that distance from the centres of civilisation does by no means imply backwardness at the present day, is going to have the electric light. The engineer is a M. A. J. Rousseau, and the contract has been taken up by an English company. *Fiat lux!* Kieff is going to make rather a curious, and certainly an original, experiment. It is proposed to apply the cogwheel principle, as used on the Rigi, to street railways. Kieff is situated on a hill rising on the bank of the Dnieper, and the principal street communicates with the river by means of a very steep descent. The railway will be laid up this incline, and will carry up goods and horses from the wharfs. The power will be obtained from a stationary engine or a hydraulic motor; when not actually employed on the railway it will be used for sawing wood, and performing work of a similar nature.

The inhabitants of countries like Russia, which are exposed to the two extremes of climate, and find the best part of the year taken up by the winter, are naturally deeply interested in the question of the warming and ventilating of their buildings. It is therefore an evidence of the conservatism of Russian society that this question has not yet received satisfactory and authoritative

scientific investigation. The Russians, endowed by nature with huge forests, still use wood for fuel. They have enormous Dutch ovens of fire-brick, and they have made practically no progress in the economy of fuel or the construction of stoves. Nevertheless, the question of warming buildings might have been considered as practically solved, so comfortable and snug are Russian houses during the severest months of the year, had not the question of fuel shown a disagreeable tendency to become troublesome. The timber of our country is really unlimited, and it is to be feared that the limits to which the production of Russian timber can be brought have long since been reached. For years past the price of wood as fuel has been rising by rapid and alarming strides, until at last Russian society sees itself forced to reconsider the whole question of warming, and to discover new and more economical sources of fuel. The other question, that of ventilation, has, it must be confessed, been scarcely even touched, Russians apparently sharing the views expressed by some of our own English specialists at a meeting of the Institution of Civil Engineers, not so very long ago, that ventilation and warming are in antagonism to each other. The Russians have been quick to decide which master they shall serve, and have adopted the Mammon of heat to the entire exclusion of the deity that presides over cleanliness and pure air. Of late the technical world has awakened to a true sense of its shortcomings in this respect, and American systems of warming and ventilating have been introduced, though with but partial success. But the question of fuel remains still undecided, and a society has been formed with the somewhat formidable-looking name of "Tovariŭstŭestvo po Otopleniyou i Ventilyatsiyou Zdanii," for the purpose of making experiments in ventilation and heating, and with various kinds of fuel, and for the preparation of plans, and affording facilities for consultation. This society will commence operations in the current year. In the meantime the results obtained by General Lazareff in 1879, during the Turcoman expedition, with naphtha, have led people to hope that petroleum might possibly prove the fuel of the future. These hopes, however, have been most rudely shaken by careful scientific experiments made at various places, which have shown petroleum to be a most uneconomical, a most dirty, and a very dangerous fuel. Apart from these disadvantages, however, petroleum is heavily handicapped in its competition with wood and coal at starting, by its great distance from the industrial and commercial centres of the country, and the comparatively backward state of the communications. Besides this it has been estimated that all the petroleum wells of Russia could but suffice to supply warming material for the country for a period of twenty-five years, whereas there is sufficient coal to last the inhabitants some fifteen centuries. Russia finds itself, therefore, thrown back on coal, but there are several reasons against its universal adoption; and the first of these is, perhaps, based on the prejudices of a nation accustomed to burn wood for ages, and regarding coal with an aversion only to be equalled by some of our own representative artists and art-critics. Another reason against the immediate adoption of coal as fuel is to be found again in the insufficient and undeveloped communications, and the general backwardness of mining industries in Russia.

Space here compels us to close our article, but we cannot do so without making a remark which will strike many of our readers as trite, but which nevertheless should be kept continually before the English public. Russia has a great future before her. She possesses powers and capabilities quite incommensurate with her past history. Russia is situated on the border-land of European civilisation and Oriental gorgeousness and mysticism, and from a union of these two much may be expected. The very air in Russia is filled with a mysterious solemnity that sends a thrill through the soul, and makes one think. The frost and snow, the sudden transformation from depth of winter to verdant spring, the past history, the

future ambition, the vastness, the strength, the youth, the hopefulness of Russia, all these things inspire one with poetry and great ideas. And Russia has already produced great painters and great poets. We cannot conclude better than with the words of Lord Powerscourt, taken from his address to the Art section of the Social Science Congress, held at Dublin in 1882: "Any student of art who will take the trouble to go . . . to Russia finds himself in an entirely new atmosphere from what he has experienced in the rest of Europe, and will probably have some ideas put into his mind there which will tend to widen his views of the conceptions of the human imagination. That country has its own characteristic art ideas, and what must strike those who have seen it is a certain largeness and sumptuousness in their style, although this may be mixed to some extent with the barbaric." Gothic architecture is also "barbaric." Such an admixture need not necessarily be deplored.

THE DEFENCE OF BUILDINGS FROM LIGHTNING STROKES.

It is impossible to overrate the importance to architects and all connected with building operations of the subject which forms the heading of this article. Although this country is not subject to disastrous thunderstorms to anything like the same extent as many districts on the continent of Europe or in America, yet the fact that the Registrar-General's report gives 192 deaths from lightning in the eight years ending 1878, and that in one month in the year 1879 no fewer than 200 distinct accidents were reported by Mr. Symons, shows that a great deal remains to be done in the way of affording adequate protection against this danger. It must also be borne in mind that the above number of deaths by no means represents the real number of fatal accidents caused by lightning, as those resulting from its indirect effects, such as the falling of chimneys and other parts of buildings, would not be recorded under this head.

Although it is more than 100 years ago since the first lightning-rod was fixed on a public building, the general ideas which prevailed as to the cause and nature of lightning, and as to the best means of preventing damage from it, have been of the vaguest possible character, and the publication in 1882 of the Report of the Lightning-rod Conference showed concisely and clearly the wide differences of opinion which obtained among those who were supposed to be authorities on the subject. Notwithstanding all the progress which has been made during the last few years, we are still only on the threshold of an acquaintance with the properties of that subtle and powerful agent electricity, which appears to pervade the whole of nature, and all is conjecture and theory as to the source of the vast amount of electricity which is stored in the earth and the atmosphere. This knowledge can best be increased by a large accumulation and close examination of facts and by the freest possible ventilation of opinions; and the Royal Institute of British Architects were well advised in inviting Colonel Parnell to read a paper on the action of lightning, as this gentleman's views were known to be somewhat at variance with those arrived at by the Conference already alluded to.

When a body charged with electricity is brought near another body, it induces in the latter a charge of the opposite kind of electricity. The words "positive" and "negative" are applied to these opposite kinds, but, probably, no one is able to define the difference between the two. That there is a difference between them is certain, as the recent experiments and investigations of the late Mr. Spottiswoode and Mr. Moulton showed clearly that the discharge of positive electricity offered quite distinct features from that of negative, and that the two kinds behave in totally different ways, but very little is really known on this branch of the subject. Between these two opposite kinds of electricity there is a powerful attractive force, which increases in strength as the bodies are brought near to each other. As long as the

intervening medium offers sufficient resistance to the force tending to bring these electricities together, no action takes place, but as soon as the electrical density of the two opposed surfaces is sufficient to overcome this resistance disruptive discharge takes place, and the bodies on which the charges were collected return approximately to their original state. If the medium intervening between the two conductors be dry air, which offers very high resistance to the passage of an electric current, the discharge is accompanied by sparks and a snapping noise, varying in intensity according to the strength of the current, and mechanical work of some kind is performed. These are the ordinary phenomena which can be observed with any small electrical machine, and they differ in degree only, and not in kind, from the tremendous explosions which occur in heavy thunderstorms. The generally-accepted theory of these is that the earth and the clouds constitute two enormous electric conductors separated by the non-conducting air, and the opposite electricities of the two conductors may be described as being in a continual state of endeavour to get at one another. Electricity, like every other form of force, invariably selects the line of least resistance, and the whole problem of the defence of buildings and persons from damage by lightning resolves itself into this:—What is the best means of providing safe paths for the opposing electricities of the earth and the clouds, so easy and so numerous that they will under all circumstances be selected in preference to others which are not safe? Some difference of opinion appears to exist as to whether the lightning stroke is downward as has generally been supposed, or upward, as might frequently be inferred from an examination of the damage done by it, and as Col. Parnell believes invariably to be the case; but practically this is not an important matter, as the discharge is instantaneous. The probability is that the direction of the stroke at any given point depends upon the proximity of that point to the earth or the clouds; if nearer the former, the stroke would be upward; if the latter, downward; and it may frequently happen that the top of a lofty building will be farther from the earth conductor than from the thunder-clouds as the latter have been ascertained to lie as low as 150 ft. from the earth. But whatever be the direction of the stroke, if a safe path be provided for it no harm will ensue.

Dr. Franklin, of Philadelphia, was the first to erect a lightning-rod, in 1752, and seventeen years later St. Paul's Cathedral was furnished with one. For nearly sixty years after this the use of rods was sporadic only, as many persons entertained the belief that rods were a source of danger rather than security, and it was not till Sir Wm. Snow Harris took the matter up scientifically, and impressed upon the Government the absolute necessity that not only public buildings, but also ships, should be protected from the effects of lightning, that any general system of defence was adopted.* The state of scientific knowledge was at that time very inferior to what it is now, and there can be no doubt that several erroneous conclusions were arrived at by Harris, and these were not fully controverted until the Lightning-rod Conference investigated the matter, collected a mass of evidence, and formulated a code of rules.

No more conclusive evidence as to the protective action of lightning-conductors can be referred to than the case of the town of Pietermaritzburg, which used to be the scene of frequent lightning strokes; but it is now provided with a complete system of lightning-rods, and the result is that whereas thunder clouds are as frequent as ever in the immediate neighbourhood, and lightning discharges occur on all sides of the town, there is no discharge and no thunder while the clouds are passing over the town itself, and this proves that the rods act as they are theoretically supposed to act, viz., that they offer a path for the silent dis-

* An interesting letter from Mr. Ewan Christian, describing one of the earliest applications of a lightning conductor to a church tower appears in vol. i. of this Journal, (p. 367).

charge of the electricity from the clouds to the earth. There are, however, a number of cases reported where buildings have been damaged, notwithstanding the presence of lightning conductors, and these are precisely the instances which require the most careful investigation, and it is a very noteworthy fact that an examination of them has invariably shown that those conditions which might have been scientifically predicted as accountable for the damage did actually exist. There are four points which require particular attention in the construction of an efficient lightning conductor: 1, size; 2, continuity; 3, earth contact; 4, pointed summit. Now, in the case of thunderstorms we have to deal with electricity at an enormously higher potential than anything that can be produced artificially; but we can still be guided by analogy, for just as a pipe of a certain capacity will not discharge more than a certain amount of water, so a wire of a certain thickness will not carry safely a current of electricity beyond a certain strength, and therefore one point of the highest importance is that the lightning conductor should have a sufficiently large sectional area. In several of the cases where protected buildings have been struck it was ascertained most conclusively that the rod was totally inadequate to carry the current which attempted to pass through it. And this further point must not be lost sight of: if a conductor has a charge passing through it, nearly approaching the maximum which it is calculated to carry, its temperature will be raised, and concurrently with the rise of temperature its conductivity will be lowered, so that an ample margin should be allowed. The second point to be attended to is that the conductor should be perfect in its continuity, that joints should be avoided as far as possible, and that where they are unavoidable they should invariably be soldered. The third and most important point of all, inattention to which has been probably the most fruitful source of damage, is that the earth connexion should be good. And this implies two conditions: first, that the rod should itself terminate in a large mass of metal; and, secondly, that it should be led to permanently damp earth. The conductivity of perfectly dry earth is very small indeed, and, in fact, such earth may more reasonably be considered as an insulator than as a conductor; hence it is quite useless merely to connect the end of a lightning-rod to earth without ascertaining what kind of earth it is. The fourth point is, that the summit of the conductor shall be pointed. Theoretically, it would be impossible for the apex to be too pointed, as the sharper the point the more is discharge facilitated, but practically it is found that if points are too sharp they are liable to be fused, and hence it is advisable to have them rather short and thick.

If the lightning discharge were always simple, i.e., in the form of a single spark, it is probable that a single lightning-rod projecting above the highest point of a building, and with perfect earth connexion, would form an adequate protection to any building; but a thunder-cloud appears to have several centres of intensity, probably caused by the existence of a number of clouds insulated from one another, and the discharge is frequently multiple. The existence, therefore, of one lightning-conductor in a large building would not always ensure its safety, and as metals afford an easy path for electricity, any exposed masses of metal on the roof would be liable to be struck: consequently, these should be constituted conductors in themselves, and should form with the lightning-conductor proper and the earth a complete circuit. The exact area of protection afforded by a single rod cannot yet be said to be definitely fixed, but without the undue multiplication of rods, which is a very costly matter, it is probable that much more effective protection could be given to a building than is now the case at very slight expense by taking care that all rain-water down-pipes make good earth, and are connected with the eaves-gutters at their sharp angles. This is a matter of some importance, for an electric current dislikes angles, and

if it has to turn a sharp corner it is not at all unlikely to jump from the corner to the earth, or to some object which attracts it, and to do damage in its course. No one nowadays would think of erecting a building of any size without a complete system of lightning-conductors, but the desirability of protecting smaller buildings has not been sufficiently insisted upon. No doubt the loftier or larger a building is the more likely it is to be struck; but the fact must not be lost sight of, that with the increase of population small dwelling-houses are now erected in situations which would have been considered quite unsuitable a century ago on account of their permanent dampness, and it is extremely probable that a small building on a low wet site is more likely to be struck by lightning than a loftier one on a dry site. It is, therefore, of the greatest importance that those external features of a building which are universally used, such as gutters and down-pipes, should be utilised as far as possible to ward off danger from lightning, and this could be done in many cases without any extra cost. In addition to metals, chimney-flues up which a heated column of air is rising offer an easy path for electricity. The cases recorded are numerous in which lightning has passed down a chimney and then dashed across a room from the fireplace to some attractive object, and this danger could be obviated, or, at any rate, materially lessened, by connecting the range or stove directly with the earth. This, again, would be a very simple and inexpensive matter in places where, owing to the dampness of the soil, thunderstorms are probable. It cannot be too strongly insisted upon that protection from lightning is ensured by providing plenty of free paths, which the current will make use of, and if this evil were continually kept in view, and a little common sense combined with a little scientific knowledge were brought to bear upon the subject, there would soon be a considerable diminution in the number of destructive accidents during thunderstorms.

The meteorologists and electricians came down on Colonel Parnell on Monday evening like a wolf on the fold, prepared to devour him and all his works, and it must be admitted that, in many respects, he offered them an easy prey; but his paper will not be without good results if it brings home to architects the great importance of cultivating a slight acquaintance with scientific subjects, in a word of recognising the fact that architecture is a science as well as an art. There is too great a tendency at the present time to delegate all matters of this kind to specialists. Where expense is no object specialists may be of the greatest possible assistance to an architect; but cases are continually occurring in the general course of practice where specialists cannot be called in, and this subject of the action of lightning is only one of many wherein a slight acquaintance with physical science would be of the greatest possible advantage both to the architect and his client.

THE PROPOSED EXTENSION OF TRAMWAYS IN IRELAND.

ALTHOUGH but little attention has been aroused in England by the passing of the Irish Tramways Act, the contrary has been the case on the opposite side of the Channel. Letters from Ireland say that the first impression that was produced by the Royal assent being given to that measure was a feeling that it was only a case of "ask and have," and that little more was necessary in order to obtain a tangible share of the public wealth than to lay down a line of tramway on a map, and apply for the money to make it. The map of Ireland, indeed, is said to have been scored over with a confused tangle of proposed tramways in a manner which very forcibly contrasts with the well-ordered diagrams of the railways. The latter, in great part owing to the care of Sir John Burgoyne, have been laid down with more attention, on the one hand, to the physical features of the island, and, on the other hand, to strategic and commercial requirements, than

is at all the case with the railways of Britain. Already, however, it has been found out that money is not to be had only for asking. Discouragement has resulted; but as there are still projects on foot for a longer length of new Irish tramway lines than the aggregate which has yet been constructed in the whole of the United Kingdom, it is worth inquiry how far Ireland is likely to be able to pay for the construction of more than 500 miles of tramway.

The first point that will strike any one who is familiar with the communications of the country, or who has read with attention the information on the subject that is contained in the Report of the Select Committee on Canals, is the enormous discrepancy between the estimates for the 600 or 600 miles of tramway now projected, and the 56 miles which, according to returns commencing in 1876, were open at the middle of 1882. In Ulster, from 100 to 120 miles of new lines are projected; in Leinster, between 150 and 200 miles; in Munster, 130 miles; and even in Connaught, with its low and vanishing population of 123 souls per square mile, from 90 to 100 miles are still talked of as feasible. As to cost, it is "confidently stated that the steam tramways will cost, at the very least, 3,000*l.* per mile, probably 3,250*l.*; while the cost of the light railways is similarly represented at 4,000*l.* or 4,500*l.*" It does not seem to have struck the framers of these imaginative estimates to inquire what has been the actual cost of the 56 miles of tramways now open in Ireland. We take the liberty to supply the defect. A return to an order of the House of Lords made in August, 1882 (245, 1882), gives particulars of the capital and traffic on all the street and road tramways open on the 30th of June in that year, from which it appears that every mile of Irish tramway open had cost, at that date, 16,400*l.* This cost is considerably higher, not only than that of the railways of the United States, but than that of the railways of Ireland itself, as well as of British tramways.

Five hundred miles of Irish tramway, therefore, at the cost per mile of the tramways already made in Ireland, will cost 8,200,000*l.*, or about one-fourth of the sum expended on the Irish railways. What grounds are there for expecting a traffic that shall pay interest on this sum, so as to cover the guarantees of the Baronies? Because to obtain money, from whatever source, upon a guarantee of interest, to be expended on works of which the beneficial returns are not likely to cover the guarantee, is only to repeat on a larger scale the ruinous and demoralising expedient of the so-called "public works" of 1848.

In the first place, it has to be noted that Ireland is already exceptionally well provided with the means of communication, in proportion to her population. Her roads are longer, in proportion to the population, than those of either France, Italy, Scotland, or England. There is a mile of highway to every 110 persons in Ireland, against a mile to every 188 in England, to every 178 in Scotland, to every 143 in France, and to every 555 in Italy. There is a mile of canal to every 666 persons in Ireland, while there is only a mile to every 594 persons in England, and one to every 1,111 in Scotland. As to railways, there is a mile to every 2,177 persons in Ireland, against one to every 1,922 in England, and one to every 1,284 in Scotland. Thus, as far as providing for the wants of the travelling public is concerned, Ireland has no cause to complain. Now as to the use made of these facilities. No statistics exist of the traffic by road in Ireland; but as to the use made of railways, the travellers per mile in Ireland are less than one-fifth of those in England, and less than one-fourth of those in the United Kingdom. Where the average Englishman spends 18*s.* 6*d.* in railway travelling, the average Irishman spends 6*s.* Where the average Englishman spends 2*s.* for the carriage of goods, the average Irishman spends but a little over 3*s.* Thus it is not merely the difference in density of population which renders the financial return of new methods of communication more than doubtful in Ireland. There is no doubt a marked contrast between the density of 442 persons per

square mile of population in England and Wales, and that of 224 per square mile in Ireland. That has to be taken into account. When we are asked to pay for 100 miles of tramway in Connaught, we are bound to compare the population of that province, which is 123 per square mile, with that of an English district in which a tramway can just manage to support itself; as, for example, Lancashire, with 1,831 persons per square mile, both districts being enumerated in 1881. The average gross earnings of the tramways of the United Kingdom in 1882 was 3,300l. per mile. Can we anticipate, on the data above given, a fifth of that sum as the gross take of a new Irish tramway? And can we expect that a traffic of that magnitude can be worked as cheaply as the present rate of 80 per cent. on gross receipts?

The truth is, that for every country the physical conditions on the one hand, and the wants and requirements of the population on the other, define very sharp limits as to the best mode of communication to be effected. To say that such and such a method had succeeded in one place, and that, therefore, it will do so in another, is simply childish, unless the conditions are alike. The term "steam tramway" is used as if it had some magical value, instead of simply meaning a comparatively inefficient and very expensively worked railway. Although we would fain anticipate better things, it should be noted that up to the present time steam tramways have not proved a great financial success anywhere; and in cases where locomotive traction has been introduced on tramways for a time, horse haulage has been reverted to. There were only four tramway locomotives at work in Ireland in 1882, only ten in Scotland, only sixty-two on the 444 miles of English tramways. Of horses, on the other hand, 1,327 were at work on the Irish lines, 3,062 on the Scottish lines, and 13,471 on the English lines of tramway. Now considering that it takes only one, or at the most two, horses to pull an ordinary tramway car, this proportion of seventy-six locomotives to 18,130 horses, is very conclusive as to the character of the majority of the tramways of the United Kingdom; and this comparison tells not only as to traction, but also as to expenditure of capital. A tramway fit to be worked by steam power must be more costly than one fit only for the use of horse-power. Yet the Irish tramways,—with only one-third per cent. of locomotive working,—having cost 16,400l. per mile, we are asked to believe that in future "steam tramways" will be made for from 3,000l. to 4,000l. per mile. This statement is hardly complimentary to the common sense of the English public.

The total saving, as a simple mechanical truth, which, under the most favourable circumstances, can be effected by the use of a tramway, is very small. This we are in a position to state positively; as on the one hand we can refer to mechanical data, and on the other hand to the outcome of seven years of experience in working. On a perfectly level line the resistance to traction on a tramway is only half that which is experienced on a road in good order. But if this road ascends only at so slight a rise as one in thirty, the total advantage derivable from the use of tram-rails is only one-fifth of the tractive power,—or little more than one-tenth of the whole working expenditure. Against this saving of one-tenth, or of from a farthing to a third of a penny per ton per mile, has to be set the interest on capital. This amounts (as a matter of fact) to above three farthings per ton per mile on the average of the tramways of the United Kingdom. Thus, subject to any deduction for the cost of highways, in cases where they do not now exist, and have to be made, there is a loss of about one half-penny per ton in the actual cost of transport by tramway, as compared with a well-horsed vehicle on a common road.

Where traffic is so dense as to allow a reasonable certitude of filling a tramcar, the diminution of tare, or dead weight, may be such as to reduce the cost per passenger so far as to compare, not unfavourably, with omnibus traffic.

But that is the most that can be said. We are in possession of the working costs of the tramways of the United Kingdom, and also of those of the London General Omnibus Company, for the same period. The gross charges of the latter were about one-third of a penny per passenger higher than those of the tramways. The comparison lacks one element of exactitude, viz., a statement of the length of journey averaged in each case: that is nowhere given. But taking the returns as they exist, the fare by tramway averaged 1'93d., that by omnibus averaged 2'29d., and that by the Metropolitan Railway 1'80d. per passenger. Of these fares, 0'37d., 0'14d., and 1'16d., respectively, are allotted to the payment of interest on capital, which was at the rate of five per cent. on the tramway stock, the same on the railway stock, and of 8½ per cent. on the stock of the General Omnibus Company.

Thus for urban or inter-urban lines of great traffic there is a certain advantage to be derived from the use of the tramway system, although it is very much less, as regards cost of working, than that to be effected by railway. On the other hand, the cost of metropolitan and urban railways is so high as to prevent the public from being benefited to the full extent by their introduction. The actual cost (exclusive of interest on capital) of conveying a passenger on the Metropolitan Railway is only 0'64d., against 1'56d. by tramway. But the interest on the enormous capital of the former, which is more than 600,000l. per mile, demands 1'16d. per passenger, to pay interest, against 0'37d. per passenger on the tramway. For equal numbers of passengers carried by the two routes the cost would be more than forty times as much for interest by rail as by trams. The bulk of the trains, and the great number of passengers conveyed by the rail, reduce this forty-fold to about three-fold.

But while with a traffic of from 1,300 to 1,400 passengers per mile per day (which is more than three times that of the average on the railways of the United Kingdom, although only about one-eighth of that of the Metropolitan Railway), tramways may be made to yield from four to five per cent. on the capital cost of construction, and more in some cases, it is quite otherwise as regards the conveyance of goods. The great elements of cheapness in railways are: first, the speed at which the traffic is conducted; secondly, the large size of the trains, or units of despatch; thirdly, the avoidance of hills, attained at a cost of at least as large a sum spent in works per mile as the entire capital of a tramway company; and lastly, the facility in traction before mentioned. Of these four elements of economy possessed by the railway, the tramway possesses only the last, and that to such a degree as is inadequate to allow of the conveyance of goods by tramway at a price to compete with a good service by ordinary road. Thus, when it is alleged that a tramway from Downpatrick to Ardgliss and Killough is "likely to be an extensively well-paying line," as affording a means of conveying the herrings caught off the latter station to the market of Belfast, it is left out of sight that a well-organised service of horse-vans over a good road would perform that service more cheaply, and in every respect as conveniently, as could be done by a tramway, if made.

It is nothing short of deplorable to see time wasted, money lost, and eager hopes excited, which are certainly fated to meet rude disappointment, from the broaching of such schemes as that of an extensive system of Irish tramways. In the early times of the railway system it was incumbent on the promoters of a new line to show, at all events a *prima facie* probability of remuneration to the capitalist. In the present case it is possible so closely to analyse the results of experience as to leave little doubt on that head. Yet we see a whole kingdom,—which certainly does not offer a safe field for any rash experiments,—excited by hopes which are not only manifestly unfounded, but which are in the very teeth of full experience on the matter. The counsels of the engineer are

nowhere more necessary than for the preparation of such a scheme. To what these counsels, if taken in time, would point, we think admits of no mistake. Disappointment at the present stage is bad enough, but what would it be when millions, more or less, shall have been wasted in adding to the already formidable list of the unproductive works of Ireland?

Since the above was written, we have received the "Manual of Financial, Railway, Agricultural, and other Statistics," by Mr. Chas. Eason, of Dublin. Mr. Eason is the editor of "Eason's Almanac for Ireland," now in its tenth year, and the author of a paper on "Railway Rates," published by the Statistical and Social Inquiry Society of Ireland. He says of Ireland, "None of the new lines of railway constructed in the past twenty years have been successful commercially," and is of opinion that tramways that "are to be started in the expectation of paying their way" will prove failures. Mr. Eason's inference is that the State should make light railways, or tramways, at the cost of the taxpayer, to be worked by any of the "existing solvent railway companies."

NOTES.

From a case reported in a recent number of the *Paris Gazette des Architectes* it would seem that the French Government, unlike ours, recognises some degree of legal property on the part of an architect in his design. A provincial paper, the *Revue de l'Architecture en Belgique*, had published a view of a building at Antwerp designed by M. Beyaert, contrary to the expressed wish of the architect. The latter brought an action against the editor of the paper, his counsel pointing out that copyright in every other branch of art was defended by law, and that it would be an anomaly if architecture were excepted. As he was pleading to French and not to English judges, the claim was allowed, and the proprietors of the journal compelled to publish an apology and to pay all costs. The argument for the defendants was that the building, being finished and standing in a public place, was public property. This would unquestionably be allowed in England, and there may be something to be said on that side of the matter; but the case illustrates, at all events, the far greater respect paid to artists and artistic rights in France, as compared with our own country. We have known a case in which a journal procured *sub rosa*, by means best known to themselves, an architect's lithographed illustrations to a lecture, published them, and boasted of the exploit. In France such a piece of "industry" could probably have been met by a sharp practical rebuke at the hands of the law.

From a report in the *Sanitary Record*, it appears that an interesting and very impartial analysis of the respective merits of the cremation and the earth-burial systems has been made by Dr. Hinsch, at a recent hygienic meeting at Hamburg. Though Dr. Hinsch did not "charge" in one direction or the other, the general conclusion from his arguments would be in favour of earth-burial. He considers the idea that there is anything to pollute the air about a cemetery, when burial is made at sufficient depth, a delusion; and he is entirely incredulous in regard to the communication of fever by germs remaining in the soil, and asserts that in such cases the real origin of the disease has been traced to foul ditches, cesspools, &c. In regard to cremation, he pointed out, what seems to have escaped many advocates of the system, that, if it were universally employed, the space required for permanent storage of urns would be as great as that which earth-burial, with re-employment of the ground after a term of years, demands now. We may add our conviction, which we believe most unprejudiced persons will, on consideration, concur in, that with a universal use of cremation the contaminating of the air from the results of combustion would be a much more serious evil than any which can be imagined to exist

in connexion with an earth-burial cemetery under proper regulation. As to the matter of sentiment, there is not, to our thinking, much to be said in favour of one system rather than the other; and if any, the balance is on the side of earth burial. Dissolution neither by combustion nor by decay is pleasant to think of in connexion with those who were dear to us; but the mind is more definitely called to it in relation to the momentary action of combustion than in the other case; and the cemetery tomb, overgrown with turf and flowers, is certainly pleasanter to the fancy than the aspect of a huge combustion-mill, which is what we should have to come to if cremation became compulsory.

THE report, which will be found on another page, of Professor C. T. Newton's able and interesting lecture on the Ionic Monument at Xanthos, one of the most notable remains of Lycian art, will,—although abbreviated by the exigencies of space,—give some indication of the value and interest of the lecture. The course now in progress of delivery by him is only one of several courses which he has delivered since his appointment to the Professorship of Archaeology at University College some three years and a half ago. Keeper of the Greek and Roman antiquities in the British Museum, and known far and wide for the zeal with which he studies the treasures committed to his care, he is, as a lecturer, brimful of his subject, and marshals and weighs the evidence for or against any thesis which may be broached with a lucidity and skill which are only surpassed by his learning and candour. We make a point of calling special attention to these lectures, because we should like to see larger audiences present when they are delivered.

THE talk which has been recently made about the laxity in regard to the adoption and enforcement of precautions against fire in theatres seems to have suggested some evil thoughts about other classes of buildings, and the respected Institution in Albemarle-street has come in for more than one rap in respect of its facilities, or rather its difficulties, of entrance and exit, and not without reason. Something might surely have been added to the grumble, in respect of the ventilation. The room is one of the most easy and agreeable to speak in, and one of the most uncomfortable for the listeners, in London. The audience are liable to be asphyxiated while listening to the teaching of science, and on a sudden alarm of any kind might find themselves very much in the position of a reel in a bottle. The back staircase is rather an additional danger than a safety valve, as it is that make of stair which affords every chance for the development of a crush. The best security against this latter danger lies in the presumable power of self-control on the part of the class of persons who mostly compose the Albemarle-street audiences, and who are, it may be hoped, not so likely to lose their heads in a panic as the mixed audience of an average theatre. But against poisoning by excess of carbonic acid even self-control is of no avail.

THE further excavations on what is now admitted to be the site of the Home of the Vestals at Rome have led to the disclosing of a considerable portion of the plan of the building, showing remains of the living-rooms and bath-rooms, and an unusually large and long atrium, an oblong in the proportion of 60 to 23, with the shorter side abutting on the dwelling, the whole forming, with its colonnade, as has been remarked, "a kind of cloister, forming also a covered way between the house of the Vestals and the Temple." Considerable remains of marble and mosaic pavements have been found.

A CORRESPONDENT draws attention to the "Requirements" of the New River Company, recently issued, for the constant water supply in St. Pancras in March next, which are creating quite a stir in the parish, as it was generally considered by the Vestry and rate-payers that all necessary preparations had

been made. Meetings are about to be held to protest against the alleged waste and unnecessary expense. There appears to be an antagonistic feeling aroused, which the company need not encourage, and could easily remove by the withdrawal of the obnoxious mandate.

THE announcement of the abandonment, "for the present," of the Bill for the Channel Tunnel was a foregone conclusion from the time when the Government intimated that it would be their duty to oppose the passing of such a measure. Indeed, it can hardly have occurred to any person familiar with the Standing Orders of Parliament that the sum requisite as a deposit, in the case of a *bond fide* Bill for the authorisation of such a work as an independent enterprise, was likely to be found. To obtain help from the Government was an essential part of such a scheme, however this part of the project was veiled. And as, down to the present time, no reliable estimate of either the cost of construction, the amount of traffic, or the cost of working, has been put before the public, there must have been a very extraordinary dependence on the readiness of the British capitalist to find money, on the vaguest possible chance of return, to lead any one to attempt to float the scheme. Whatever may be in store for us hereafter, the ventilation of a tunnel twenty-four miles long, so as to render it a passable channel for frequent trains, is as yet an unsolved problem.

Now that the Mont Saint-Michel question has been settled, after what, in spite of Victor Hugo's eloquent appeal, it is impossible to deny was a somewhat exaggerated expression of alarm, we learn that the question of the termination of the façade of Santa Maria Del Fiore is re-opened. As was reported in these pages, the matter, after having been submitted to the arbitration of the Arts Club at Florence, had been almost unanimously determined in favour of the basilical form of termination. But though this view coincided with that of the majority of the Florentines, the directing committee of the works have suspended operations, and from all appearances, we learn, would seem to desire to leave the façade in its present unfinished state rather than conform to the popular decision. We have already expressed our opinion that the "Gothic" termination is most in harmony with the general architectural design of the façade.

AN analysis of the tables appended to Captain Shaw's annual report of the fires of the year might lead to some useful suggestions as to the particular times and places at which danger from fire is most to be apprehended. Taking the list of places at which fires have occurred, we find by far the largest number, 440, under the heading "private"; next to this comes "lodgings," 256 fires in the year. From this there is a great drop to the tradesmen's premises, of which the highest number is furnished by victuallers (sixty-five fires in the year); the next by oil and colour men (48); but next to this one is rather surprised to find drapers (40). The other high numbers are furnished by builders (35), bakers (30), chandlers (30), boot and shoe makers (30), confectioners and pastry-cooks (33), tailors and outfitters (27), milliners and dress-makers (22). Most of the others are small numbers. Among the causes of fire the highest are "light thrown down" (184) and "lamp (spirit) upset" (141); the next is "spark from fire" (131), showing strongly the advisability of leaving fires protected at night, if they cannot conveniently be raked out. The next highest is "candle" (115), this being, we suppose, candle carried in the hand, as distinct from "light thrown down." "Swinging gas brackets" are answerable for no less than 48 fires, probably in bedrooms, and swinging into the curtains; a constant source of danger among careless people. "Defect in flue," goes for sixty-two, and "Children playing with lucifers" have caused no fewer than sixty-two conflagrations. "Hot ashes" caused sixty-one; this seems to rank with "spark from fire," it is

only another form of the same danger. "Seeking for an escape of gas with a light" has caused eighteen fires; not so many as we should have anticipated. It is fair to the plumbers, who are much and often too justly accused as incendiaries, to note that only one fire of the year is attributed to "plumbers at work"; it should also be noted that "linen airing" before the fire has caused forty fires. No less than six fires are put down to "friction of machinery." The "daily and hourly summary of fires" forms a sort of fire barometer, whence we can see at what time in the twenty-four hours we are most remiss and in most danger. The scale is highest at nine in the evening, when 198 fires originated; from six p.m. to two a.m. is the most fatal period; at one and two in the morning it stands at 107, then at three there is a large drop to 79, decreasing to 37 at six in the morning, the lowest point. The figures rise gradually after this to an average of from 60 to 80; standing at 85 for five p.m., and rising to 108 at six p.m. The extremes of the higher numbers, at six p.m. and two a.m., are almost exactly the same. Buckle would have appreciated this evidence of the tendency of "accidents" to occur in regularly recurring proportion. The evidence thus tabulated is well worthy of being read, marked, learned, and inwardly digested, by that portion of the public who would remain unburned.

"THE Fine Art Society" have appended their title as the signature to a letter in the *Times*, touching the threatened decay of the art of engraving. A great part of the falling off in the demand for and the value of engraving they consider arises from the amount of piracy of artists' designs which is carried on through the medium of photography, and the indifference or apathy of the artistic body under this grievance. The want of new engravers equal to the older masters of the art, to fill their places, is a real and serious fact, and we have no doubt that this arises from the fear lest the growing use of reproducing processes should deprive the engraver of his field of work. We join with the Society in the hope and belief that mechanical reproduction will not drive out the art of engraving, though it may restrict its application. People who care for artistic handiwork will not long be satisfied with the woolly surfaces and emaculated effect of the best of the reproducing processes. There is a run upon them at present, but we do not believe it will last to anything like the same extent. The fashion among many architects at present of speaking with horror and contempt of wood-engraving, seems to us an affectation. A good wood-engraving is a more powerful and effective mode of representation than any such thing as an "ink-photo" can be. Unfortunately, its cost restricts its use, and it is necessary also that the engraver should understand architectural detail; but, granting this, his intelligent interpretation of it in his art has a separate artistic interest, far superior to that of mere chemical or mechanical reproduction.

THE PRISONS OF SOUTHWARK.

"The King's Bench is in Southwark; its rules are more extensive than those of the Fleet, having all St. George's Fields to walk in; but the prison-house is not near so good. By a Habeas Corpus you may remove yourself from one prison to the other. . . . And, indeed, both are but the show and name of prisons."—*A Journey through England, De Fox.*

On the 7th ult. Mr. George Russell, M.P., with Dr. Bridges of the Local Government Board, visited, in connexion with the present movement as to the homes of the poor, the model dwellings for workmen, Queen's Buildings, Southwark. The dwellings have arisen over the site of King's Bench, which, removed hither from the vicinity of St. George's Church, about 1760, was pulled down in 1880-1. A Marshalsea of the once movable *Curia Domini Regis* had existed in the Southwark bailiwick from a period remote. It was established here temp. Edward III., long before the borough liberty and the clink or manor of Southwark were formed into the Bridge Ward Without; and presented a special object of attack to Wat Tyler's men in 1381 when, according

to Hall's Chronicle, the rebels broke up the gates of the Marshalsea and King's Bench in Southwark, and, adds Stow, took from thence the prisoners and brake down the house of Sir John Inwirth, Marshal of the Marshalsea and King's Bench. A similar fate, we may here observe, befell its neighbour and *quondam* contemporary the White Lion (or Borough) Prison, whose inmates some rables apprentices released in 1640*; the Clink; and its successor in St. George's Fields,—which three suffered by fire and pillage at the hands of the "No Popery" rioters, June, 1780. For a long while there were a Marshalsea and a King's Bench as separate prisons in the Borough. These both stood on the eastern side of the main thoroughfare. The former lay between Axe and Bottle-yard, which has since vanished, and Mermaid-court, where is now the junction of Newcomen (originally King) street with Borough High-street. The latter, being nearer to the Church of St. George-the-Martyr, stood between King's Bench-alley and Angel and Shaw's courts,—its position now marked by Layton's buildings. Angel and Shaw's courts are renamed Angel-place and Coroner's-court respectively. The distinction clearly appears in a map drawn for the 1720 edition of Styrpe's "Stow," as well as in several of later dates which we have consulted on this point. It would seem that subsequently to the removal of the King's Bench to new buildings in St. George's-fields, and before the pulling down (1842) of the Marshalsea by Mermaid-court, the name was transferred to the more southerly premises at Angel-court. This change, however, was not made at once, for in a map of 1808 we find the latter still designated as the King's Bench County Gaol. That gaol being a survival of the earlier King's Bench was rebuilt in 1811 for a debtors' prison,—the Marshalsea of the current century. Common belief points to its utter extinction, consequently upon the 5th and 6th Vict., c. 22, which consolidated by style of Queen's Prison the Fleet, the Marshalsea, and the Queen's (King's) Bench.† But in truth it remains to this day in the buildings between St. George's-churchyard and Angel-place as it winds into Long-lane, Bermondsey. There stands the three-storied block of eight houses placed back to back, each containing seven rooms,—the male debtors' quarters. Beyond are the Tap, its ground-floor the beer and wine rooms; its first floor the tapster's and turnkey's rooms; its upper floor set apart for female debtors; beyond this again the Admiralty Prison, two solitary cells for refractory inmates, and the Chapel. The Tap-house, Chapel, &c., latterly converted into a house of detention for smugglers, now serve as a registered lodging-house, whose interior, in view of its former use, is well worthy of inspection. Hither Charles Dickens, a forlorn neglected child, came from his attic lodging in Launceston-street at the house of the Insolvent Court agent (whose servant-of-all-work he immortalised as "The Marchioness") to spend Sunday with his father. The rooms he mentions may be readily identified, and it is they, in this same Marshalsea, which play so frequent and important a figure in the still-life of his "Little Dorrit." These impoverished tenements can be well viewed from the stone steps at the end of Coroner's-court, and better by taking the first turning out of Angel-place. Here, on the right hand, is the old kitchen; on the left hand the debtors' prison, surrounded on its three sides by the narrow stone-paved court with the pump at which Mr. Fanks refreshed himself on a memorable crisis in Dorrit's fortunes. The upper windows look across a high wall over the grave-yard, a desolate place enough at that day, but which has been set in order and opened (May 22nd, 1882) as a recreation ground for the parishioners. The back parlour of the cheese-monger's shop,—No. 211, High-street,—is the turnkey's lodge wherein Mr. Chivery took his turn "on the lock," and whence young John in rapture would watch Little Dorrit about the stone yard beyond.

* Thus writes Laund in his "Troubles." Formerly an inn, the White Lion served as the county gaol until the building of the prison in Horsemonger-lane, as to which see the text *infra*. Clink Prison was at the corner of Maid and Gravel lanes. The Borough Compter, Mill-lane, Tooley-street, was originally part of St. Margaret's Church.

† The Palace Court, or Court of the Marshalsea of the Queen's House, transferred in 1811 to Scotland-yard, was finally abolished in 1848. On the authority of the unknown yet reputed compiler of "peta,"—itself written in the Fleet, temp. Edward I.,—this ancient court was second only to the High Court of Parliament.

A project has been set on foot by the Metropolitan Public Gardens Association for acquiring a portion of the now vacant site of Horsemonger-lane Gaol.* The exterior walls and gateway as they now stand include some three acres and a half. Built as the Surrey County Gaol in 1796-9 by John Gwilt, who was then county surveyor, its lodges and main entrance wear a sombre and stately aspect; in good keeping with their object, as well as with the massive King's Bench wall, supported by rounded buttresses and surmounted by *cheneux-de-frise*, that lately frowned over the opening into Borough-road hard by. Soon will it be forgotten that the internal arrangements of this gaol, the first of their kind, were due to the philanthropic exertions of John Howard, and that here Leigh Hunt, imprisoned for his libel on the Prince Regent in the *Examiner*, received Tom Moore and Lord Byron. Yet few will desire to preserve any recollection of the shocking scenes before its gates which attended the deaths of criminals on the roof above the portal: such as, for instance, the execution of Mrs. Manning and her husband, or of Colonel Despard, with his six accomplices, for high treason.

Diffident indeed are the traditions of the King's Bench. Down even to Oldys's day the name of the Prince of Wales's chamber kept alive a memory of one of the most cherished episodes in our domestic history, when a judge did not hesitate to uphold the law's majesty which a king's heir had treated with insult. Puritan martyrs and political satirists, Bonner and Rushworth, Baxter and De Foo, were no strangers to its walls; here Smollett wrote his "Sir Lancelot Greaves," and Coombe his "Tour of Dr. Syntax." Kit Smart, translator of Horace, and John Tull, who invented post-chaises, died within the Rules. Haydon's paintings of the "Mock Election" and "Chaining the Members,"—the former bought by King George IV. for 500*l.*,—portray incidents in a burlesque ceremony the choice of a member for Tenterden (as the prison was called after the Lord Chief Justice) by the "Collegians" in July, 1827. The story goes that a creditor chancing to be in the prison at the time forthwith released his debtor from a place in which confinement seemed to carry so little punishment. The Bankruptcy Act of 1861 freed many insolvent debtors; an Act of 1862 discontinued the Queen's Prison, removing the inmates to Whitecross-street. Whereupon the King's Bench buildings passed into Government service, and served as a house of detention for military offenders, and finally for convicts. The Rules, which included nearly all St. George's Fields, may be traced along the parish bounds as follows:—From the church along Blackman-street, Newington-causeway, St. George's-road, and St. George's Mall, across Westminster Bridge-road, along Tower-street, Baron's-building, Webber-street, Great Friar-street, Great Suffolk-street (*antique* Dirty-lane), and so across Blackman-street to St. George's Church again.

We refer above to the "No Popery" riots. Of these the best contemporary accounts may be found in Dr. Johnson's correspondence,† and in a letter from Dr. Markham, Archbishop of York, to his son, the late Admiral Markham, then taking his first cruise in mid-Atlantic.‡ The mob besieged both Houses, the members being compelled to "sneak home by private ways and in disguises." The Archbishop believed that the causes of the riots lay deeper than was commonly supposed, and in proof of this cites that his own residence had been marked for destruction, though he was free from any share in the enabling Bill on behalf of the Popists. Men of good position, or, at any rate, of good resources, acted as gang-leaders. Of two captured in a burning house one wore diamond buttons at his shirt-front and lace ruffles; the other, equally well dressed, carried a plan of London in his pocket. Dr. Markham affirms that the riots were spoken of in anticipation at Paris, at Amsterdam, and at the Hague, whilst bets were made that London would be in flames on the 8th of June. As a matter of fact, the mob assembled on the 2nd of June, in St. George's Fields. The next day many mansions of obnoxious individuals, with the Roman Catholic

* Horsemonger-lane is re-named Union-road. The prison was taken down three years ago.

† See particularly his letter to Mr. Thrale, under date the 9th of June, 1780.

‡ A Naval Career during the Old War: being a Narrative of the Life of Admiral John Markham. London: Sampson Low & Co. 1883.

chapels, were destroyed. On the 5th, thirty-six fires blazed in as many places. On the night of Wednesday, the 7th of June, the rioters opened the Fleet, King's Bench, Newgate, Marshalsea, Bridewell, and Clerkenwell Prisons, setting on fire the first three. It is amusing to read of Wilkes as one who, slyly observes Dr. Johnson, had ever been zealous in the cause of decency and order, protesting that were he entrusted with the power he would not leave one insurgent alive. Wilkes was one of the first prisoners in the New Bench, and it is said that his room there, on the ground-floor to the left-hand of the outer house, by the inner gates, was afterwards occupied for a short while by Lord George Gordon himself. As restored after the riots, King's Bench consisted of one large building, about 120 yards long, having a Protestant chapel at the centre, with one for Roman Catholics in the southern wing. Each cell was vaulted and made completely of brick. The number of bricks in the whole edifice was truly amazing. The roof, too, was of most singular construction. The foreman of the works for the demolition informed the writer of this article that it was found to be supported entirely by a series of brick arches gradually diminishing to the apex.

A MOATED DWELLING-HOUSE.

WHENEVER a new edition of Turner's "Domestic Architecture" comes to be written, large additions must be made to the description and construction of the old moated manor-houses, of which so many yet remain in the midland districts. We have, it is true, a copy of the contract for building a manor-house at Bushwood, in the Forest of Arden, as the northern part of Warwickshire is yet called, and we know approximately the quantity and cost of the materials thought necessary for such a dwelling in the days of the Plantagenets. This house came afterwards into the possession of the Catesbys, who re-edified the neighbouring church of Lapworth (which is interesting as being the only instance of a detached spire in Warwickshire) in the time of Richard III. The house and estate were sold by Robert Catesby, to raise money for the Gunpowder Plot, and now it is gone and the site only remains. There is, however, in the immediate neighbourhood, a moated house, built about the time of the Wars of the Roses, which is still habitable, and inhabited by the lineal descendant of a former owner, Henry Ferrers, the well-known county genealogist. It was from this old Elizabethan pedigree-hunter that the conspirators bought the lease of the house in Vinegar-yard, where they first began their mine beneath the Houses of Parliament. This Manor-house of Baddesley Clinton is situated in the very heart of the Forest of Arden, amid surroundings that must be interesting to every architect, to every historian, and to every lover of his country's literature. The neighbourhood teems with specimens of ancient fortified dwellings, from the rude earthen rampire which surrounded the homestead of the old forest dwellers, to the regular quadrangular intrenchments of their Roman conquerors, and the mounds on which the Saxon invaders built their "burhs." It was the home of the Wrens too, and Sir Christopher himself is said to have dwelt at Wroxall Abbey, and to have designed a very interesting farm-house at a place which bears the strange name of "Bedlam's-end," and opposite to one of the old forest trees of Arden, of which there are many about. This tree is, however, remarkable for being a parish boundary, and is mentioned in the earliest deeds relating to the neighbourhood, and is, at least, coeval with the legend of the appearance of St. Leonard to the old crusader, which, it is related, caused him to build the neighbouring Abbey of Wroxall. Between the abbey and the moated house at Baddesley is an old house which, for many years, belonged to the Shakespeare family, a timber-framed structure built in the shape of the letter E, so common in Elizabeth's time. In a little room over the porch Shakespeare is said to have written his sonnets, and it is shrewdly surmised that, as the name of Isabella Shakespeare appears in one of the registers of the religious houses of the neighbourhood, this is the ideal forest of Arden depicted in "Measure for Measure." The old forest comes close up to this old homestead, and is known as Haywood. Near it, strange to say, the lily of the valley grows wild, yet it is one of the few plants that

Shakespeare does not mention. The great fortresses of Warwick, Kenilworth, and Tamworth are within easy distance, and the fine fortified mansion, known as Marston Castle, is within the forest, so that the whole neighbourhood is full of interest, alike to the artist, the architect, and the archaeologist.

The home of the Ferrers at Baddesley Clinton is said, in an ancient rhyme, to have been the home of a Saxon mayor of the name of "Bade" or "Baddes." It is known to have come into the hands of the Clinton family, hence its distinctive name; and, in the time when the feuds of York and Lancaster were distracting the land, it fell into the hands of one Brome, who, in the reign of Henry VI., was a lawyer and a man of some importance in the county town of Warwick. It was a member of this family who built this stone mansion, and, judging by the common occurrence of the name in the neighbourhood, it was close to the paternal home of the family. The site chosen does not differ materially from the sixty or seventy similar moated areas in the northern part of Warwickshire, from which the buildings have disappeared; but in this instance the moat washes the walls of the edifice. There is no court, terrace, or foothold of any kind near the walls, which are not only carried beneath the bed of the moat, but are so built as to permit a covered way round the entire quadrangle beneath the level of the water. This passage is lighted by gratings above, and there are recesses for placing lamps in at night. The passage, strange to say, is dry; there are no signs of leakage or exudation from the moat, which is from 12 ft. to 20 ft. broad. The entrance is obtained by a substantial bridge, which has replaced the ancient drawbridge and leads to an embattled porch; there are no signs of a portcullis, but the outer and inner gates are heavy. The house evidently depended on the moat and its inert strength for security against attack. The old windows had strong bars and heavy mullions. The staircases were narrow and winding. The inner court was paved, but in more recent times a portion has been transformed into a garden. The domestic arrangements appear to have been altered in the Elizabethan times, when the Ferrers family were in possession; for the windows of what is now the dining-room, on what we may call the ground-floor, bear the arms of the Ferrers and their alliances on pane and panel, and were evidently the work of the old pedigree-hunter; whilst the great hall is over the gateway on the first floor, and from it galleries extend to the sleeping and private apartments. These galleries are built in the fashion of an "alcove," close to the outside wall. The windows of the apartments open to the courtyard, so as to permit the household and retainers to occupy the "points of vantage" in case of an attack. It is only after an inspection of the upper passages that the use of the lower passages becomes apparent. Unfortunately, the alterations which have taken place, and the demolition of the buildings on the western side of the quadrangle, have destroyed the completeness of these arrangements for the defence of the house, which were designed with great care. Along these passages are many remains of door-fittings and ironwork of curious design and workmanship. This peculiarity is also observable at Marston. The hall has a circular roof at present. It is hung with tapestry, and commands a fine sylvan view over the valley of the Blythe. Except the chimneys, there is little else to call for special remark. These are of twisted and spiral brick, collared, and of singular height and graceful proportions. The drainage is carried off by a large sewer, which passes under the moat to the low lands on the south. It is strongly guarded by iron bars. The sanitary arrangements are, indeed, very complete. The gardens are on the eastern side, facing the west and south. There are pleasure grounds to the west, evidently laid out in the last century. It was on this side that persons skilled in the arrangements of old houses looked for some sign of another moat, but here the builder depended on the single moated enclosure for defence. When the moat was cleaned and deepened some years ago, there were no signs of trout having been introduced; yet trout are common in the moats of Warwickshire, for they were utilised largely as fish-ponds.

We pass through a shady pathway from the house to the church,—a plain structure of the ordinary Warwickshire type. It consists of a

nave and chancel only, with a tower at the west end. It is built, like the house, of the freestone of the neighbourhood, which, on exposure to the atmosphere, assumes the appearance of New Red Sandstone, through the growth of a peculiar lichen. The church is only remarkable for being built in a wood, and in consequence of a former owner of Baddesley Clinton killing a priest whom he thought too intimate with his wife. The present edifice was built in expiation of this crime; but, before it is left, the old chancel-screen, which is now placed against the tower arch, should be inspected. It is of the Jacobean period, and of the rudest design and construction. It was placed in its present position when the church was restored at the expense of the late Lady Chatterton, the well-known novelist, and it was at her instance that the chancel was wainscoted with the commonplace oak panelling which she bought from some neighbouring house. The house is still inhabited by a member of the Ferrers family, and there are not a few who associate his moated dwelling with Shakespeare's Mariana in "Measure for Measure."

STREET AREAS.

It must have been a novel experience, even in a professional career as wide as that of Mr. Wyatt, the well-known architect, when a week or two since a pair of van-horses crashed through his iron railings and fell into the street area of the house at the eastern corner of the British Museum, so well known to all Londoners. The curious accident, though fortunately a rare one, is not by any means as unprecedented as might be imagined in the metropolis, and is, we consider, eminently suggestive of a professional question which cannot fail to have presented itself to the mind of any one acquainted with other cities than London.

It would be curious to learn by what singular chain of traditions it comes about that with an unlimited amount of sky into which to build, and from which to save ground-rent, it should be considered necessary in an ordinary dwelling-house to burrow into the earth. In city thoroughfares where rent is high and space difficult to obtain, the accommodation obtained below ground effects of course an enormous economy, but why, we repeat, it should be considered necessary in an ordinary dwelling-house to relegate a number of living beings to a level beneath that of the pavement is a point not by any means made satisfactorily clear. It is this traditional plan which necessitates the "area," its regulation railings with their awn-spring spikes, and the equally regulation flight of steps, requiring constant pipe-clay, all features which, familiar as they have become on our shores, are not to be met with elsewhere. True it is that our American cousins have continued the traditions of the "old country," but the basement floor takes a larger domestic place than with us, and the "stoop"—the flight of steps,—has doubtless, through Dutch influences, assumed a social importance unknown on this side of the Atlantic.

Blocking up pavements, already too narrow, in our overcrowded cities; harbouring dirt; admitting, in a somewhat gloomy climate, light but feebly into underground rooms, which the simplest rules of hygiene must condemn as unhealthy for purposes of habitation; the regulation "airy" of Cockney fame is a feature of modern existence which all practically-minded reformers should endeavour to abolish. It would be curious to hear what are the arguments in defence of the institution. Abroad, the "area" has never been found necessary at any period, and with exceptions which are outside the question, no one is condemned to live in rooms below the level of the pavement. Such portions of the house are devoted to cellars, stores, and warehouses. We are aware that, of course, it will be objected that the whole mode of life on the Continent differs from ours; that the more universal system of living on flats leads to the kitchen of each family being on the same floor as the rest of the *appartement*, using that word in its French sense; but, granting this difference from our mode of living each in his own house,—or when in lodgings in houses utterly unfitted to be thus let out in imperfectly-arranged flats,—we fail to see why it is an obligatory feature of the plan of the English dwelling-house that the kitchen should be so conveniently placed in the basement that even in the best-regulated families the smell of a cockery contrives to find its way to the living-

rooms,—all because we feel it obligatory to place our kitchen at a level of several feet below the pavement. Under such conditions the "area" is, of course, necessary, but why, because in a distant part this architectural disposition was deemed necessary, should it continue to be adopted? That its existence is not obligatory is shown by its absence in the plans of many modern houses.

Did there exist in our country as strict a body of regulations regarding the proportionate height of dwellings to the width of street, as is enforced in France, we could understand that perhaps there were reasons why it is found advisable to burrow in the earth; but when such excrescences as the Hankey buildings tower into the air, side by side with houses of two stories,—when, in fact, in every direction are now being built houses of considerable height,—the "area" should be abolished by law as dangerous, unhealthy, clumsy, unsightly, and occupying a vast amount of valuable room on pavements which are already far too narrow for even the existing needs of communication. When one recalls the shaky gratings over which one is constantly called upon to pass in a walk along a crowded thoroughfare, the thought suggests itself that we should be thankful that accidents are not more frequent.

CELTIC ART.

THE director of the Public Industrial Art School in Philadelphia, Mr. Charles G. Leland, has thought it worth his while to send a message across the Atlantic to tell the English people that the unemployed hours of the Irish labourers might be devoted to the production of some art-decorations, and so introduce industrial reform by reviving the old art instincts of the people. He tells us that in America the children of Irish parents are as apt as those of Yankee birth in acquiring a knowledge of drawing, and he takes up the question warmly, asserting that whenever there have been artistic tastes developed they may lie dormant for a time, but are never altogether lost, and he urges that this would be found to be the case with the Irish people. We must not overlook the fact, however, that the art relics of Ireland are singular and anomalous, for rich as Ireland is in remains and traditions of the past,—remains which are as interesting to the student, as the traditions are puzzling to the historian,—there is a singular absence of art-treasures which can be ascribed to the last thousand years. In the earlier centuries of the Christian era there was a school of art,—Celtic art as it has come to be called,—in Ireland. It spread over Europe, even to Rome itself. It faded and died at home just as it was being developed in England and abroad as a healthy, useful portion of our national life. The late Mr. Evelyn Philip Shirley, one of the most painstaking and conscientious of Irish historians, confessed he could not account for this. The fact struck him more than possibly it would have done an Irishman, from his knowledge of the rich treasures which have been preserved through long ages in other parts of the British Isles, and in other lands. Irish history, too, teems with records of bygone magnificence. We are told of splendid palaces and of the existence of academies whose fame attracted the whole youth of Western Gaul. There are some enthusiasts who yet believe with Dr. Stukeley that the great Watling-street way which traverses England was formed by, or for, the alumni of these early seminaries of learning, of art, and of theology. The names and sites of many of these are known, but on visiting the scenes where these palaces and schools flourished there is not a vestige of their grandeur to be discovered, beyond the few gold and bronze ornaments which now and then come to light. Along the west coast there are certainly the remains of cyclopean edifices of unknown antiquity situated on old sea margins, which might be as old as Ptolemy, who described the coast. There are also the tombs, the cromlechs, and the "raths," of these early inhabitants; but these do not display any of the ornamental carved work which is so marked a feature in many old dwellings. Many of the massive gold ornaments which have been dug up from time to time are quite plain, though some have been twisted; it is evident that there was no incipient art instinct at work to give them character. There is evidence enough of the accuracy of the old geographer, but the schools

and palaces have hardly left a perceptible trace on the plains they were once said to adorn. A few slight mounds, a "rath" or two, as the circular entrenchments are termed, possibly a round tower and a ruined chapel, all in a greater or lesser state of decay. If these ruins are examined carefully they reveal nothing of past grandeur. The mouldings are of the simplest, and the carving (if there is any) of the plainest character. There is nothing to show that the builders or founders were endowed with a sense of beauty which found expression on sites so grandiloquently described, and which must have been the resort of wealthy as well as devout people.

There is a well-known and oft-described site of this description a few miles from Ennis, in the county of Clare. It is called Doora or Dura,—"the place of oaks." It was, according to the old chroniclers, the great seminary of the West. Nothing now remains to tell of its past glories, or the forest which gave it its distinctive name, save the remains of a round tower and a doorway, with what architects call "Early English" caps and mouldings. There are traces indeed of earth disturbances, but without a visible plan or other distinctive feature. Careful search failed to find any trace of foundations. A dreary-looking lake washes the site and extends to the limestone ridges on the west. There is nothing to show the prevalence of an artistic taste, or that the little chapel was more ornate than a hundred others whose ruins are seen everywhere around. Even the famed palace of Kincora, like that of Tara itself, is an earthen mound and nothing more. When we call to mind that the county of Clare, or North Thomond, as it was called, was the home and territory of "Brian the brave," that it was and is peculiarly the country of the Celtic race, a land where no Sassanach found a permanent home, and neither Geraldine nor De Burgh kept state within its boundaries, we should expect to find some trace of a cultivated taste which would show how far art found it a home. There is, as in every part of Ireland, an abundance, nay a perfect wealth of ancient remains. There are, in addition to the stone fortresses before alluded to, earthworks by the hundred, castles by the score, religious houses of every size and class. Many of the abbeys are in a wonderful state of preservation, but the architecture is of the plainest,—even the few towers which remain have no storied panels or effigies to tell their tale or recount their history.

These remains are typical of the paucity of architectural detail and artistic sculpture throughout Ireland. It is true that beautiful crosses exist, like those at Monasterboice, for instance, which have counterparts in the Isle of Man and in Scotland. They are fine monuments, which only make us regret that the people who erected them had not left us other memorials and other fragments to verify the stories of grandeur and magnificence in their edifices. Even those churches which passed into the hands of the Episcopalians have not preserved more relics than those which have been despoiled and left to go to ruin. Where a portion of the old edifice has been turned into a Protestant place of worship a few corbel heads and finials are kept, but of the period anterior to the English invasion, the relics are so few as to suggest the thought that they existed only in the glowing imaginations of the old bards. Possibly the round towers may belong to this period, but their age, like their use, is one of the archaeological problems.

It will, possibly, be suggested that the destroying hand of the invader has obliterated all these traces of bygone magnificence; that the wars of Elizabeth, of Cromwell, and William of Orange did much to destroy what edifices Ireland could boast of; but, whether we visit the hill of Cashel and view the Norman details of Cormac's Chapel, or wander amidst the immense ruins at Adare, which tell of the power and wealth of the Geraldines, the stately ruins of Mucross, or the hundreds of religious edifices whose ruins form so picturesque a feature by river, lake, and meadow from Cape Clear to Lough Swilly, and from Hag's Head to the Hill of Howth, we find but little trace of decorative art, but abundant evidence of sound construction and thoughtful arrangement. There is a blank to be filled up to a greater extent than Petrie, Wakeman, Kean, or Westwood has yet done. The Royal Irish Academy have done much, and their Museum is suggestive of rude wealth, of great ability in the age of bronze, and many of the objects are indicative of the

influence of that species of interlaced ornamentation which we term Celtic.

This absence of specimens of art instinct during so long a period rather militates against Mr. Leland's theory; indeed, it would seem as if the art-workers of the sixth to the tenth century belong to a race that have died out. In the last volume of the *Builder* (vol. xlv, p. 139) we gave some instances of the uses of cable and knots as ornament, which partook somewhat of the interlacing, the weaving as it were of bands into intricate patterns, which is so distinctive of the Irish manuscript illuminations, but the Irish intertwined fantastic animals into their work. They bordered their hands with fine dots. They filled up the borders with L and T figures, with angular markings repeated again and again, like those of the South Sea Islanders. They, in fact, elaborated the rude ornaments found on what we term British pottery, but which was undoubtedly of Celtic origin. It would be well, indeed, if the Irish people could reproduce, either for decorative purposes or for any article of general utility, some specimens of those beauteous forms which culminate in the Book of Kells. This wondrous masterpiece of ornamental illumination is not known as it deserves. It is a school of decoration in itself, and the only wonder is that the skill, the patience, and the art died out. Long before Strongbow and his Anglo-Saxons came over the glory of Celtic art had departed, and we are forced to the conviction that much of the glowing imagery of palaces, halls, and bygone magnificence were derived from the fine manuscripts which have been preserved, and which later scribes could not emulate, and claimed as a national characteristic what really belonged to a small and restricted school of art penmen. If Mr. Leland's ideas are to effect any practical good they must have first a tendency to technical education; art will then follow.

THE ACTION OF LIGHTNING STROKES IN REGARD TO THE METALS AND CHIMNEYS OF BUILDINGS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The following is a brief abstract of the paper on this subject read before this Institute on Monday evening last by Col. the Hon. Arthur Parnell (late R.E.). The author deemed that the best form in which to present his case to a body of practical men like the Royal Institute of British Architects, would be to make the heart of his essay a mass of hard facts, associating with these facts an analysis separating and classifying the more important circumstances and phases of action recorded in connexion with the lightning strokes, and to supplement the whole by a brief commentary. The paper was the fruit of his research during the last four years into the nature of the action of thunderbolts. The cases, 506 in number, were picked out from a collection of recorded instances of lightning strokes, 1,145 in all up to date, occurring between January 24, 1665, and November 23, 1883. The selected cases embraced those only in which buildings were concerned, and in which metals or chimneys were described as present in the immediate neighbourhood of the scene of the stroke. The rest of the prefatory matter detailed the principles kept in view and the ingenious methods followed in indexing the records. Out of the selected cases the first thirty or so of the following fifty were read textually at the sitting of the Institute, namely:—

(43) Swinton, Eccles, near Manchester, August 6, 1809, Mr. Elias Chadwick's house. Adjacent was a brick coal-shed, above which was a cistern, with flagged top, bottom, and sides. Foundation of shed 1 ft. below ground. Its walls were strengthened by bond timbers. In 1788, 1812, and 1843, slightly shifted from upright, the copings remaining entire. Bond timbers driven further than brickwork, and looking scorched. Weight of displaced material, 26 tons. Metal spouts, brackets, and leaden water-pipe uninjured. (92) Parish Church of Week St. Mary, Cornwall, November 8, 1873, the tower to which had been struck in 1683, 1812, and 1843. Details of latest disaster from the Rev. G. Hopkins, rector, and Mr. J. P. St. Aubyn, F.R.I.B.A. (102) St. Michael's Church, Stamford, August 14, 1857. Pinnacled tower. At the base of the south-eastern pinnacle a 3-in. iron rain-water pipe entered the earth. The effect of the discharge was to uplift the whole mass, imparting to it at the same time a kind of circular motion to the southward, the apex of the pinnacle falling in a line with its original base, and the base having traversed

about the eighth part of the circle, fell into the roof of the tower. The pinnacle was a mass of masonry bound by iron clamps, and weighing about 15 cwt. (110) Nash Low Lighthouse, August 31, 1852. Description from Professor M. Faraday. (119) Villa at Cannes, France, about 1874. High position, but a much higher villa, and on higher ground, within 100 yards, untouched. The remarkable details of the effects of the discharge were given by Mr. H. R. Dugmore, who was in the house at the time. (120) Berehaven Lighthouse, February, 1877. The stroke doubtless a multiple one. Particulars taken from the Report of Inspection to Irish Light Office, Dublin. (121) Upwood Grove, Catterham, Surrey, May 28, 1877. House of Mr. James Tomes, F.R.S., the highest object in the neighbourhood, with steep tiled roof. Details reported by Mr. Rogers Field, M. Inst. C.E. (136) Brufé Church, Norway, October 17, 1872. Had a lightning-rod of iron or zinc wire, which, however, was rusty at the junction with the ground. The stroke wholly destroyed the church. (173) Wheatland, Indiana, U.S.A., April 2, 1879. The school-house. Had iron lightning-rod, with earth connections. House wholly destroyed. (187) Edgehill, June 20, 1821. House of Mrs. Clare, named Edgewood. The stroke was destructive, and details of the mischief done by the stroke, given in the order adopted by Mr. Howard in his description. (231) Ardresic, near Campbelltown, September 1, 1824. A house occupied by Miss Bremner. Howard's order of effects of the stroke followed in this case also. (271) Strathnam, June 12, 1745. Mr. Howard's public house, and instructive details of the electrical discharge taken from paper by the Rev. H. Miles, D.D., in "Phil. Trans." xlv, 383. (273) Trythall, near Moelfa Hill, Cornwall, December 20, 1752. Mr. Thos. Olver's farmhouse. Effects of stroke detailed by the Rev. W. Borlase, M.A., F.R.S., in *Phil. Trans.*, xlviii, 86. (275) Lestwithick, Cornwall, January 25, 1757. Parish Church. Copious particulars given from *Phil. Trans.*, l, 198, and *Gen. Mag.*, xxviii, 427. (286) Pembroke College, Oxford, June 3, 1765. Authority from detailed account of catastrophe, Mr. Griffith in *Phil. Trans.*, lv, 273. (288) St. Keverne's Parish Church, Sunday, February 18, 1770, struck during service. Particulars of the case given by the Rev. Anthony Williams, vicar of the parish, in *Phil. Trans.*, lxi, 71. (290) Whitfield's Chapel, Tottenham Court-road, London, March 18, 1772, a Sunday, the part struck being an addition made to the original building, and less lofty. A man sitting on a ladder lying flat on the ground, with his back against the chapel door, was killed. Record by Mr. Henley in *Phil. Trans.*, lxi, 131. (294) Gais, Appenzel, Switzerland, 1873. The village much subject to thunderstorms. Every house had iron lightning-rods on it, varying in number from two to eight. Two chalets, each defended with two rods, were burned at the event. Authority, Dr. Williams, in *Journ. Royal Met. Soc.*, ii, 432. (310) Salford, Aug. 6, 1849. Works of W. Collier & Co., machine makers. Boiler chimney, fitted with iron lightning-rod, struck. Details from Mr. William Surgeon, in *Proc. L. & P. Soc.*, series 2, ix, 60, after examination. (321) St. Mary's Church, Manchester, January 4, 1872. Circumstantially recorded (*ibid.*, xl, 70) by Mr. Henry Wilde. (323) St. Paul's Church, Kersal Moor, Manchester, summer of 1863. Mr. Henry Wilde reports this case also (*ibid.*, p. 72). (346) Government House, Calcutta, March 30, 1838. Details quoted from Mr. Stevenson's *Journal*, in *Phil. Mag.*, xlii, 177. (348) Great Street, Whitechapel, London, July 26th, 1849. Three houses on south side of street, Nos. 17, 21, and 22. At 17 a man, who was opening the door at the time of the discharge, was killed on the spot. At 21 a woman working at a silk-winding machine was hurled across the room. She had a spindle in her hand at the time. Details quoted from Mr. W. Radcliffe Burt in *Phil. Mag.*, xxxv, 161. (387) Sheffield, June 5th, 1879. House of Mr. Osbaldestone, described with details of damages to the extent of 500l., resulting from its being struck by lightning. By Mr. Newall, F.R.S., in *Nature* for June 12th, just a week after the event. (388) St. Marie's Church, Rugby, June 5th, 1879. Mr. Howard (*ibid.*, lvi, 161) furnishes the details. (398) Lumley, near Chester-le-Street, Durham, June 9th, 1883. The "Old Hall," an old stone house in dilapidated condition at about the highest part of the village. The effects of the stroke, investigated by the Colonel himself, July 2nd, 1883. Details from Canon Cusack, M.A., in *Morning Post* (July 14th, 1883). (549) St. John's Church, Bury St. Edmund's, May, 1871. Spire 160 ft. high, built of Suffolk brick, with a copper lightning-rod, which did not avert the catastrophe. Details from *Builder*, June 10th, 1871. (559) Furze Hill, Brighton, June, 1868. A detached school. Details from *Builder*, June 13th, 1868. (667) Ripponden Church, October, 1873. The lightning, in spite of conductor, it not under its guidance, melted the leaden section of the gas-piping and ignited the gas at the meter. Had not a woman give the alarm

the woodwork in the tower must have been destroyed. Other details, *ibid.*, November 1st, 1878. (875) Claypans, near Kew Bridge, Middlesex, August 19th, 1876. House of Mr. Evans. Details from paper by Mr. Anderson, read at Dublin Congress, and printed in *Builder*, September 14th, 1878. (669) Dusseldorf, January 11th, 1815. Tower of St. Lambert struck, though provided with an iron lightning-rod. The point of the rod melted and the building caught fire. (670) Bern, May 14th, 1820; a private house, with an iron conductor fixed to a wooden pole near two chimneys was struck, the flash filling all the rooms with a dazzling light. The ground was raised round the foot of the rod, whose lower end showed traces of red heat. Three persons in the house were knocked down senseless, and other mischief done inside the house. (680) Koppingen, Switzerland, June 5th, 1819. House of M. Anderogg, red from lightning by its iron conductor, with its two brass-pointed terminals upwards, and its leading into moist earth. The house was fired and the brass points vanished. (704) Farmhouse at Bucklawren, two miles from Leoo, Cornwall, struck June 26th, 1756. Details of the disaster from *Phil. Trans.*, 1757, and *Gent. Mag.*, xlviii., 157. (860) Aliphington Church, near Exeter, June 1826. Tower with pinnacles, bells and weather-vane. *Lead roof with spouts.* One person, with an iron hammer in his hand, was killed by the stroke; another was hustled many yards into the church, and the clothing of four was torn. The tower-stairs were torn up, some heavy stones removed, the communion-table dashed to pieces, and the whole building shattered. The tower wall was rent vertically, the bells were thrown out of gear, and the roof twisted. (916) Newbury, New England, North America, 1755. Details from Benjamin Franklin, the inventor of the lightning-conductor. (942) Toothill, Essex, June 18th, 1829. A windmill. The stroke tore up the stones and gravel near the iron braces under the round-house stairs, as well as the floor of the lower room, and threw some iron weights into the yard. It welded into a solid mass the links of the iron chain used for drawing up the sacks, and utterly stripped off the iron plated roof of the building. Howard (III., 321) and others were quoted for these and the rest of the details. (951) St. Martin's Church, London, July 28th, 1842. The particulars of this well-known case were given from the *Annual Register* and other chronicles of the time. (952) Brixton Church, London, struck April 23th, in the same year. The church was again struck in July, 1872. The authorities for the details were Harris, 86, and the *Builder*, December 21st, 1872. (956) Normanhurst Court, near Battle, Sussex, July, 1880. The description was given after Mr. R. Anderson (*Tel. Journ.*, Oct. 1st, 1880). (958) Hôtel des Invalides, Paris, June 8th, 1839. M. Bugnot, Inspector of works, gave a full account of the catastrophe in the *Compte Rendu*, viii., 978. (967) Stoeple Acton Vicarage, Wiltshire, June 20, 1772. Authorities for details, Mr. E. King, F.R.S., in *Phil. Trans.*, lxi., 251, and Harris, 112. (1,029) Bruntcliffe, Yorkshire, August 6, 1878. A small powder-store, connected with Victoria Colliery, holding 2,000 lb. of powder. Fitted with a copper lightning-rod, fixed to a pole about 2 in. from one end of the building by glass insulators. Point surmounted building by 13 ft. A heavy iron door at the end remote from rod, not connected to the ground nor to the rod. Powder fired, and store blown up. Two little girls 320 yards off wounded by falling debris, and adjacent buildings damaged. Case reported by Hill, Inspector of Explosives, *II.*, 9, 73, R. C., 74, (1,032) St. George's, Chelsea, London, August 1, 1846. Copious details from Mr. E. Highton, C.E., who examined the scene (*Journal of Society of Arts*, 1846), and Anderson (177), who quotes Mr. C. Tomlinson, F.R.S. (1,079) East London, South Africa. A powder-magazine, with an iron lightning-rod ending in a dry water-tank. Effects of stroke, building much damaged, rod "torn to pieces" (*Journal Soc. Tel. Eng.*, 12, 5, 75). (1,080) Coast of Ireland, March 13, 1844. A martello tower, containing powder-magazine, struck. Description, with accompanying plan, by Col. R. J. Nelson, R.E., in *Aide-Mémoire to the Military Sciences*, i., 391. (1,116) Manayunk, Philadelphia, summer of 1871. The Pekin Woollen Works, though provided with lightning-rods, set on fire and burned to the ground. Total estimated loss, 10,000. Reported on by Prof. John Wise, of the Wagner Institute.

After an analysis and marshalling of his facts in groups, with remarks as to their evidential bearing, especially on the problem of the relative liability of houses with or without conductors to be struck by lightning, which he argued, must be solved in a sense adverse to Franklin's invention, Colonel Parnell reached at last his "Practical Deductions." * Premising that he wished especially to guard against advising the members of the Institute to take any measures at all to safeguard buildings from thunderbolts, a matter wholly, in his opinion, for the architect, the owner, or the occupier,

the measures he proposed were meant simply as precautions prescribed by experience as likely to do good so far as concerned metals and chimneys. His general principle was that the use of metal in any form, whether outside or inside a building, should be minimised. He boldly condemned, as wholly useless, metallic external appliances:—(1) lightning-rods; (2) vanes, weathercocks, finials, crosses, balls, and spindles; (3) bells and clocks in towers and in elevated parts of buildings; (4) iron ridge castings; (5) metallic balconies. Inside the buildings he condemned as dangerous the employment of metal in the instance of (6) large chimney-glasses; (7) gildings. As to handy metallic appliances, external and internal, a dozen numbered rubrics followed, with suggestions of substitutes in earthenware, terra-cotta, Portland cement, glass, or asphalt; failing which, hints were thrown out for eliminating, or more or less reducing, the peril. The items (Nos. 8-19) were:—chimney-pots; flashings, hips, and other lead-work on roofs; eaves-gutters and rainwater pipes; wire guards to stained windows; tie-bars, cramps, and hoop-iron bond; copper nails for slate roofs; iron window-bars; gas pipes; roof-framing inside; flooring; organs, pianos, safes, and iron bedsteads; water-pipes. Special cases were those buildings the bulk of which is necessarily metal, such as gas-holders, oil-tanks, great railway stations, and temporary erections of corrugated iron. The precautions to be taken in these instances consisted in metallically connecting the ironwork frame to the ground at one or more places, and in providing its most elevated metals with short spikes very sharply pointed, thus converting the metallic mass into an electric tap ready to eject the whole charge that may accumulate in the ground near its base in virtue of the physical property of metal points to throw off and scatter electricity. This property seemed to have been discovered by Mr. Thomas Hopkinson, an American gentleman, in 1747. He communicated his discovery to Benjamin Franklin, who, in his letter of September 1st in that year to Mr. Peter Collinson, F.R.S., was the first to publish it to the world. It suggested to Franklin his lightning-rod, which the inventor made known in 1752, and which the European savants explained, in accordance with scientific theories then current, as a conductor of a supposed "electric fluid" darting from the clouds into the earth. They practically ignored original conception of it as an electric tap, as did the proverbially practical Franklin himself, who never troubled himself about the theory of his invention.

Passing to the precautions necessary in regard to chimneys, Colonel Parnell insisted that, as in the instance of the metals, the best plan theoretically was for buildings to be erected without them. But chimneys being a necessary evil, the endeavour must be to render them as nugatory as possible, and to deprive them, so to speak, of their sting, by tapping the ground beneath them of its superfluous electricity. To this end he suggested (1) that the metal-work on the lowest floor should be connected to the soil below by means of two iron bands, one at each side, securely riveted to the foot of the grate's front and passing down through the hearthstone and the rubbish or concrete underneath about a foot into the actual soil. (2) It was proper to fix securely and closely to the top bar of the grate two iron spikes 3 in. long, one at each side, close to the cheek of the fireplace, and leaning back obliquely towards the flue at an angle of 45 degrees. The spikes should be very sharply pointed with steel, and should be always kept sharp.

In conclusion, Colonel Parnell urged architects to make the study of the physics of lightning-strokes a part of their professional business. There seemed to be no reason why they should not. The known laws of electrostatics were of the simplest kind, and their comprehension did not involve a tithe of the mathematical knowledge needed in studying mechanical science. Enough knowledge of lightning strokes to enable an architect to safeguard a building against them was easily learned from Nature alone. It did not belong to the electrical engineer, whose province was artificial electricity. The defence of life and property from lightning seemed to rest on the labours of three classes of scientific men. The first were the meteorologists, who observed the phenomena of thunderstorms. Next came the physicists, who reasoned on the facts, and eventually deduced therefrom theories and laws. Lastly,

architects practically to apply the reasonings of the physicists.

The Chairman (Mr. Ewan Christian, vice-president), in inviting discussion, said the paper was a very interesting one, though it had, he thought, broached some rather revolutionary doctrines.

Mr. G. J. Symons, F.R.S., owned that Colonel Parnell's paper had almost taken his breath away, and he had been wondering whether we had got back to 1784 instead of 1884. Without a shadow of pertinent evidence, Colonel Parnell placed his opinion against the views and researches of all the great physicists who had lived from 1750 to the present time. As to the numerous instances cited by Colonel Parnell in support of his contention, some of them went a great way back, but as far as the circumstances could be tested at the present time they led to the very opposite conclusion to that arrived at by the author of the paper, for the buildings mentioned were either without conductors, or, where "conductors" so called had been provided, they were either improperly fixed, or had no proper earth contact, and so were utterly useless. With regard to the Nash Low Lighthouse, which was one of the cases referred to, Colonel Parnell ought in fairness to have quoted Faraday's remarks upon the case, which were given in the report of the Lightning Rod Conference.* As to the accidents by lightning at Appenzell, in Switzerland, the cause of them was that the subsoil was so exceedingly dry that it was very difficult to get a proper earth connexion, as there was no damp subsoil. It was, no doubt, quite true that the soot and warm air of a chimney were what might be called a tempting path for the lightning to follow, and hence the necessity of connecting the stoves to earth, but the metal bands of which Colonel Parnell spoke should be carried down into moist earth: if only taken down a couple of feet into the dry earth the consequences were likely to be very disastrous.

Professor Adams, F.R.S., said he entirely agreed with Mr. Symons's criticisms of Colonel Parnell's paper. The Report of the Lightning Rod Conference, to which allusion had already been made, might be taken to be the concentrated essence of the latest information as to the effects of lightning upon buildings. The members of the Conference included architects, meteorologists, electricians, and physicists, who had collected information as to accidents from, and experiments bearing upon, the action of lightning. Colonel Parnell preferred to say that the lightning discharge started from the earth and went upwards to the clouds, in opposition to the general idea that the lightning descended from the clouds. But the fact was that the discharge took place from both ends simultaneously, and met at some intermediate point, as was shown by Wheatstone's experiments with the Leyden jar.

Professor Hughes, F.R.S., said he had certainly learned a great deal from the paper, because he, in common with electricians generally, had been taught to believe in the identity of lightning with electricity, and certainly all the researches of the physicists went to confirm them in that belief. But Col. Parnell had discovered some subtle distinction between natural electricity and artificial electricity, and had discoursed of the action of "thunder-bolts." He (Prof. Hughes) should like to see a "thunder-bolt." To talk of buildings being destroyed by lightning because they were provided with lightning conductors was tantamount to talking of ships being wrecked by their rudders, or of steam boilers being burst by their safety-valves. If a ship had ever been wrecked through having a rudder, it must have been because the rudder was wrongly used, or improperly attached to the vessel. Boilers provided with safety-valves had been known to burst, but only when the safety-valves were out of order. A lightning conductor was certainly an element of danger to a building where its earth contact was imperfect, or altogether non-existent, but who that knew anything of lightning conductors, and the purpose they were intended to serve, and the way in which they fulfilled that purpose, would think of fixing a lightning-rod without providing it with good earth contact? The earth-plate should, to be effective, in some cases cost more than the conductor itself.

Mr. John Slater, B.A., in moving a vote of thanks to Colonel Parnell, said that, while dis-

* One of these was to this effect,—that buildings provided with lightning-rods were one-hundred and eighty-five times more liable to be struck by lightning than buildings without them!

* London: Spence, 1832.

agreeing with the conclusions arrived at by the reader of the paper, he thought it a matter for congratulation that so important a subject had been brought before the Institute, as it was well worthy of the careful attention and consideration of the members. He thought that a conclusive argument in favour of the great utility of lightning conductors was afforded by the case of the city of Petermaritzburg, which, formerly seriously harassed by thunderstorms, had sustained no damage by lightning since its principal buildings had been provided with lightning-rods.

Mr. Vyle, as an Associate of the Society of Telegraph Engineers, said the suggestion as to carrying metal bands from grates or stoves into the ground was first made by Mr. Preece, F.R.S., the electrician to the Post-office. If carried down into the damp earth they would be effectual, being in reality only the continuation of the conductor afforded by the soot in the chimney and the grate itself.

The vote of thanks having been carried, Colonel Parnell briefly replied, stating that his views were unshaken by the criticisms he had heard.

The meeting then terminated.

SCHLIEMANN'S TROY (HISSARLIK) A PREHISTORIC CITY OF THE DEAD.

UNDER the above title, Captain Ernst Böttcher has published in Nos. 51 and 52 of the *Ausland* a paper which is the result of long and careful study, and in which the author endeavours to throw light on the real character of Hissarlik, as opposed to the well-known views of Dr. Schliemann on the subject. It may be taken for granted that the learned both of modern and ancient times were never agreed as to the position of Troy. This celebrated town has entirely disappeared, if it has ever existed. L. v. Sybel ("Ueber Schliemanns Troja," Marburg, 1875) does not even believe in a real Troy. There was never a doubt before Dr. Schliemann that probable ruins must be in accordance with the traditions which describe Troy as the largest of the then existing cities and the ruler of the whole of Asia Minor. The first question is, In what condition are the ruins which Dr. Schliemann declares to be Troy?

The author of the paper shows us, in the first place, the position and the size of the site. We find on a low plateau at most 1 square kilometre in extent, pushed out by Ida towards the Dardanelles, a truncated cone 10 metres in height, and 150 metres in diameter at the basis, —the Hissarlik Tepeh. It is throughout a mass of uniform débris, over which the mantle of time has spread a sparse covering of vegetation. This rubbish heap, of a base of 18,000 to 20,000 square metres, is said to hide seven (!) towns. Of these, Dr. Schliemann, for ten years, called the third from the base Troy, because it contained evident traces of fire and gold treasure, and contended zealously that, besides it, there was another town burned here. Its small size (3,600 square metres) was naturally strongly attacked, and these never ending objections induced Dr. Schliemann to a "changement de décoration." In 1883 he cleared away sacred Troy, and exposed the layer of débris below it, the second from the base, corresponding to the conical form of the rubbish hill, and only a little larger than the third, and for this reason no longer called "town," but only "Acropolis" of his new Troy. This town exists in thought only. Not a single stone has been found of it. But it was soon proved that, corresponding closely to the new Troy, the second layer was also "burned." An extremely far-fetched explanation of the traces of fire was set up for the third layer, which hitherto was supposed to have borne the character of a town destroyed by fire. The walls of this "town" are erected of unburned loam bricks; Dr. Schliemann calls them simply bricks, and many will then think of our brick walls, whilst they are in reality loam walls. In order to explain the traces of fire on them (two burned-down towns were inconvenient), Dr. Schliemann asserts, "These walls were artificially burned after they had been completely erected, and Dr. Butler calls this "the discovery of the reverse mode of our erecting brick buildings."*

It is only a hypothesis fundamentally erroneous that can arrive at such absurdities. It has been left unexplained why the builders of this town left lying everywhere, even in their dwellings, the fire débris derived from burned-down walls, wood ashes up to 2 metres high, and how the urns, gold treasures, and human bones came there, whether the skeletons browned by fire were perhaps those of wall burners who lost their lives.

The criteria of Hissarlik are:—Truncated cone form of the hill, its erection in stories (layers), its contents of remains of burials (human bones, skulls, whole skeletons, ash urns, adornments of the dead in precious and base metals, all descriptions of holy vessels and symbols), as well as a peculiar kind of gigantic clay urns in the midst of large quantities of ashes, and traces of heat of 1100° C. and above. These criteria repeat themselves everywhere on the globe, either in necropolis generally or on sites where cremation has taken place. The mounds in North America, witnesses of a pre-Columbian civilisation, consist, like Hissarlik, of stories with numerous cells, in which the dead lie. Poor brick walls without mortar characterise all prehistoric cities of the dead. Analogies to Hissarlik we find in the north of Europe (in Scotland and Wales), in Southern Russia (the Kurgane), and at the Euphrates and Tigris, in the ruins of Babylon and Nineveh. Amongst the tumuli of the Troas itself, which in Turkish bear the name of Tepeh, or graves, Hissarlik does not stand alone; it is now known that Hanaï Tepeh and Kara Ngatch Tepeh are of the same nature.

Captain E. Böttcher does not refer to the dispute as to whether Dr. Schliemann has discovered Troy, and affirms that Hissarlik could not have been a city of the living. The author cites several points with regard to Hissarlik hitherto not noticed. One of these is the proof of the former existence of passages and their profile, each being formed of two parallel walls 150 to 0.50 metre distant from each other. These passages, which were about 3 metres high, afforded protection against heat and smoke, and also ensured ventilation. They are unburned on the inside, even preserving their yellowish whitewash, whilst their reverse sides, turned towards square courts, are burned to vitrification, corresponding in this respect to the burned remains which fill those courts and their subdivisions (cells). We find the same arrangement at Hanaï Tepeh. A second moment of importance is the proof that the traces of fire found at Hissarlik and Hanaï point undoubtedly more towards artificial and frequently repeated burnings than a single conflagration. The third point is the proved resemblance of the objects of every description found at Hissarlik and Hanaï with the remains of burials all over the globe. This resemblance is in continuation of the paper by the same author in the *Zeitschrift für Ethnologie*, 1883, 4, entitled "Analogien der Funde von Hissarlik," and is to be still further pursued. After showing that the large *pitioi*, enormous clay vessels, could not have been intended for storage, but are identical with large Oriental urns in which, as at Hissarlik, half-burned skeletons were found, the author arrives at the conclusion that, as at the Euphrates and Tigris, the dead were burned at Hissarlik and Hanaï in urns (furnaces) of corresponding size.

Thus we have here a hitherto unknown method of cremation, which has given us far better results than the traditional burning on a funeral pyre. The whitish powder surrounding the gold treasures, which puzzled Dr. Schliemann, consisted of human ashes. The gold ornaments found had their origin in the general custom of burning the dead with their jewellery and arms, depositing everything, ashes and melted gold ornaments, in an urn, and adding as a mourning gift other jewellery, as well as golden cups, &c. This assumption explains why it was possible that in one and the same vessel melted gold (melting-point 900° C.) and half-melted bronze (1100° C.) could be found side by side with perfectly preserved gold ornaments of very delicate (filigree) workmanship. Dr. Schliemann says that the flying Trojans had packed up their valuables, but were overtaken by the conflagration, and their treasures buried in the fire. This explanation fails if it is considered that at 1100° C., for which heat the melted bronze supplies the proof, no gold ornament could remain uninjured. The burial of the ash urns on the site of burning cannot take us by

surprise at Hissarlik, as we find the same custom prevailing later amongst the Romans. They buried not only in columbaria, but also on the site of the pyre, and then called the latter "bustum," and also "astrium."

The method of cremation supposed to have been practised at Hissarlik is then compared by the author, from a technical point of view, with the ancient and modern systems. The principal conditions were exclusion of the body from the flame, and production of very high temperatures by an abundant supply of air, points absent in the ancient method, but which the prehistoric system had in common with the modern. Of the highest interest is the proof that the prehistoric custom of cremation, marked at Hissarlik by the discovery of unconsumed skeletons browned by fire, finds its counterpart in the first experiments of Siemens, in which too high a temperature caused the soft parts to evaporate, and the bones to become incomcombustible through calcination (in the technical sense of the word). Calcination was observed also at Hanaï. The bones have a crust, formed by combination of their phosphate of lime with iron in its immediate surrounding. The skeletons of Hissarlik prove by their upright position in wood ashes 2 metres high that the body was placed upright in the *pitioi*, as was rendered necessary by its shape, and that after the bursting of the *pitioi*, in consequence of too sudden a raising of the temperature, the ashes of the wooden pile surrounded the skeleton. It is only in this way that the presence of an upright skeleton can be explained, instead of a heap of bones, to which it would have been reduced after the burning of the ligatures.

MUNICIPAL BUILDINGS, NOTTINGHAM.

DESIGN BY MR. G. CORSON.

WE illustrate this week the plan and design, by Mr. Corson, which gained the first premium in the competition for new municipal offices at Nottingham.

The frontage of the building was designed for execution in stone, and ample height of rooms was provided for, the height of the principal floors being, in basement, 15 ft.; mezzanine, 15 ft.; and ground floor, 21 ft.; an important point in the case of such large rooms as some of those required in the plan. For the rest, the plan and perspective view speak for themselves.

MEDIEVAL STUDIES.

THE two sketches by Mr. A. B. Pite, of St. Ulrich, Brunswick, and part of the west front of Salisbury Cathedral, are fine examples of bold and free architectural sketching. They exhibit in strong contrast two types of Medieval treatment, that which gains its effect by rich multiplicity of detail, not excluding mass and grandeur of style, and that which, as in the Brunswick example, is remarkable for plain and unadorned simplicity in the treatment of buttress and window.

OFFICES AND WAREHOUSES, VICTORIA-STREET, LIVERPOOL.

THIS building is divided into two parts, having a common entrance and staircase, each part having offices and show-rooms on the ground and first floors, and warehouses above, and is part of a larger block intended to be erected.

It is built of Edwards' red Ruabon bricks with red Runcorn stone dressings and red-tile roof.

The building was erected for Mr. H. Rankin, by Messrs. Nicholson & Co., 163 to 175, Wellington-road, Liverpool. Mr. Rankin supplied the constructional ironwork, with the exception of girders, which, with the fireproof floors, were by Messrs. Homan & Rodgers, Manchester. Mr. J. Clarke, C.E., F.R.I.B.A., 19, Castle-street, Liverpool, is the architect.

A PICTURESQUE VILLA.

THE design for a small house proposed to be built near Brighton, which we give this week, is a fair example of the combination of variety in the planning of rooms in a small house, with picturesque exterior treatment. The design is by Mr. A. Howell.

* Readers may, perhaps, be usefully referred to two articles, "Earthen Monoliths" and "Vitrified Building," which appeared in the *Builder* a year ago (vol. xlv., pp. 133, 203).

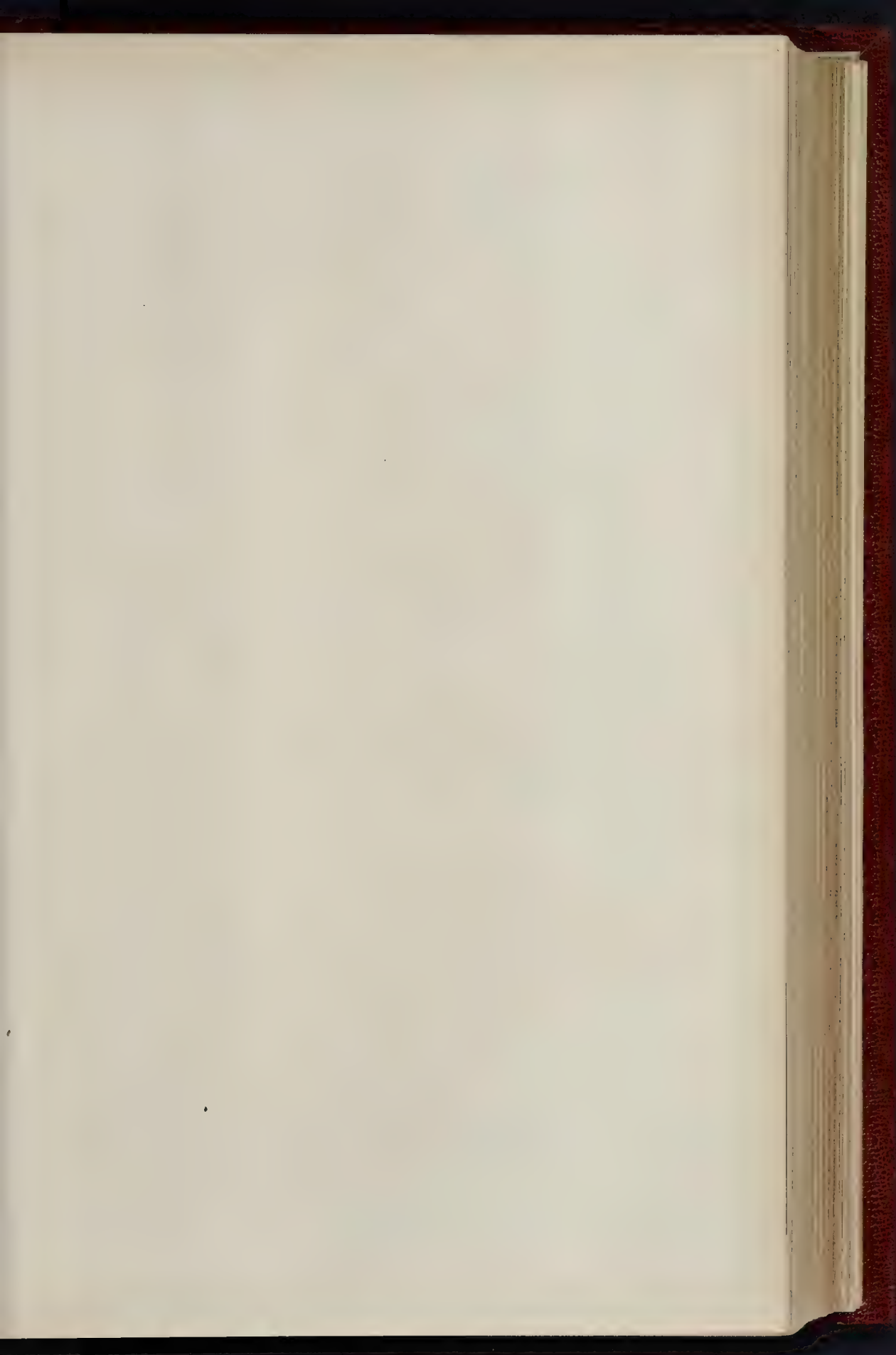


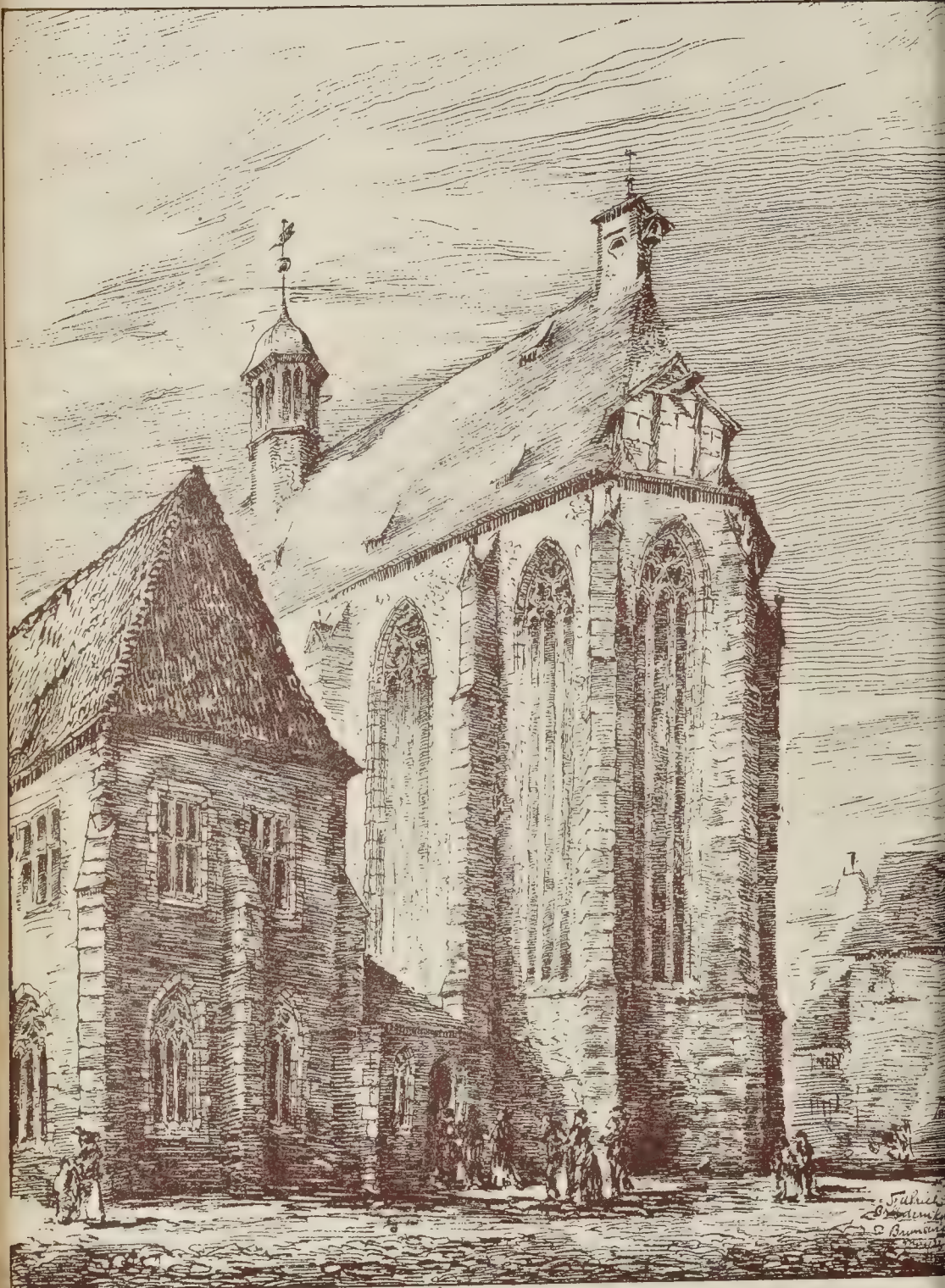


NOTTINGHAM MUNICIPAL BUILDINGS COMPETITION.—BURTON STREET FRONT.

3rd Premitted Design.

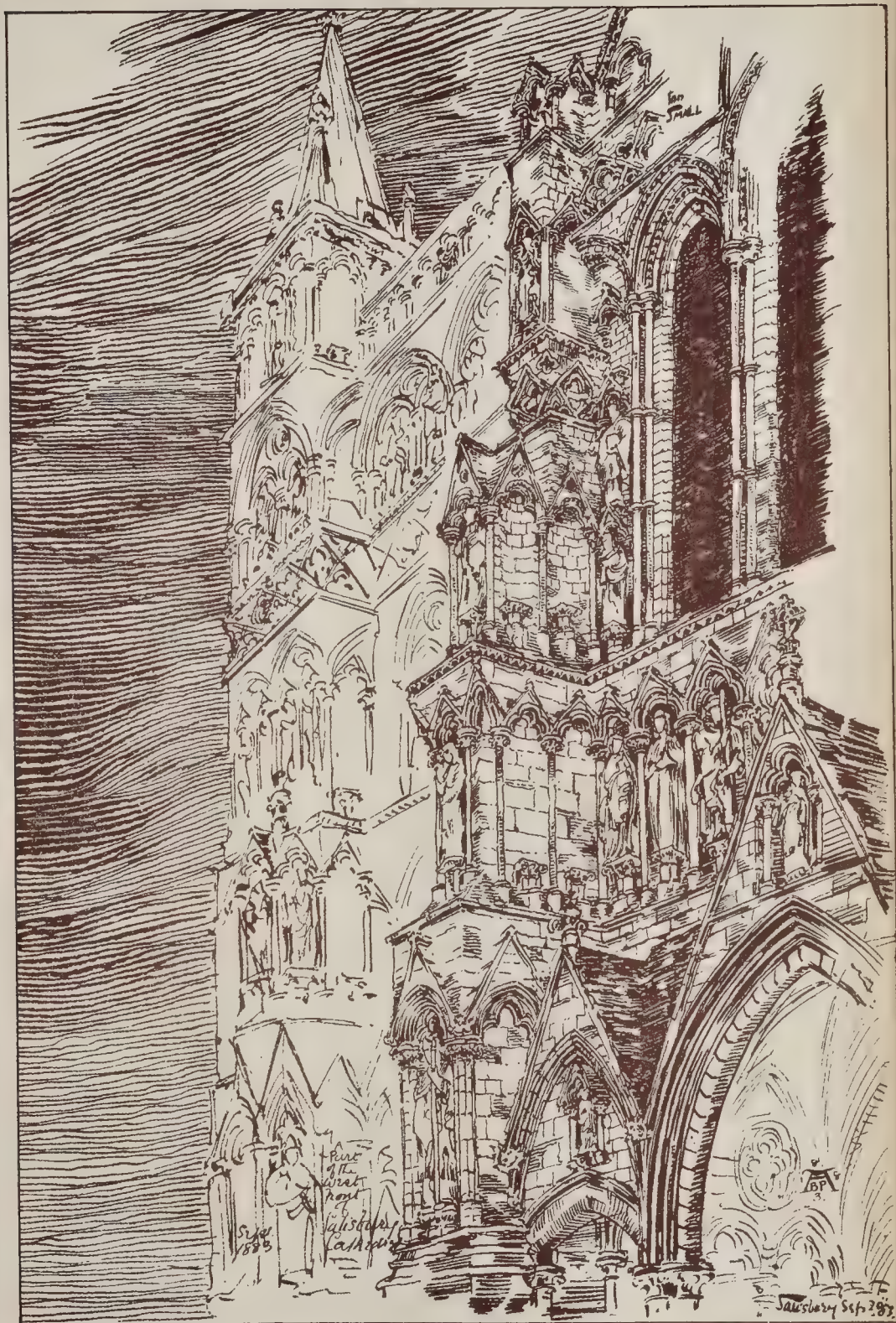
By MR. G. CURSON, ARCHITECT.





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ST. ULRICH, BRUNSWICK.



8. 1883. F. H. on London E.

FROM THE WEST FRONT OF SALISBURY CATHEDRAL.



Business Premises Victoria Street
Liverpool. John Clarke. Architect

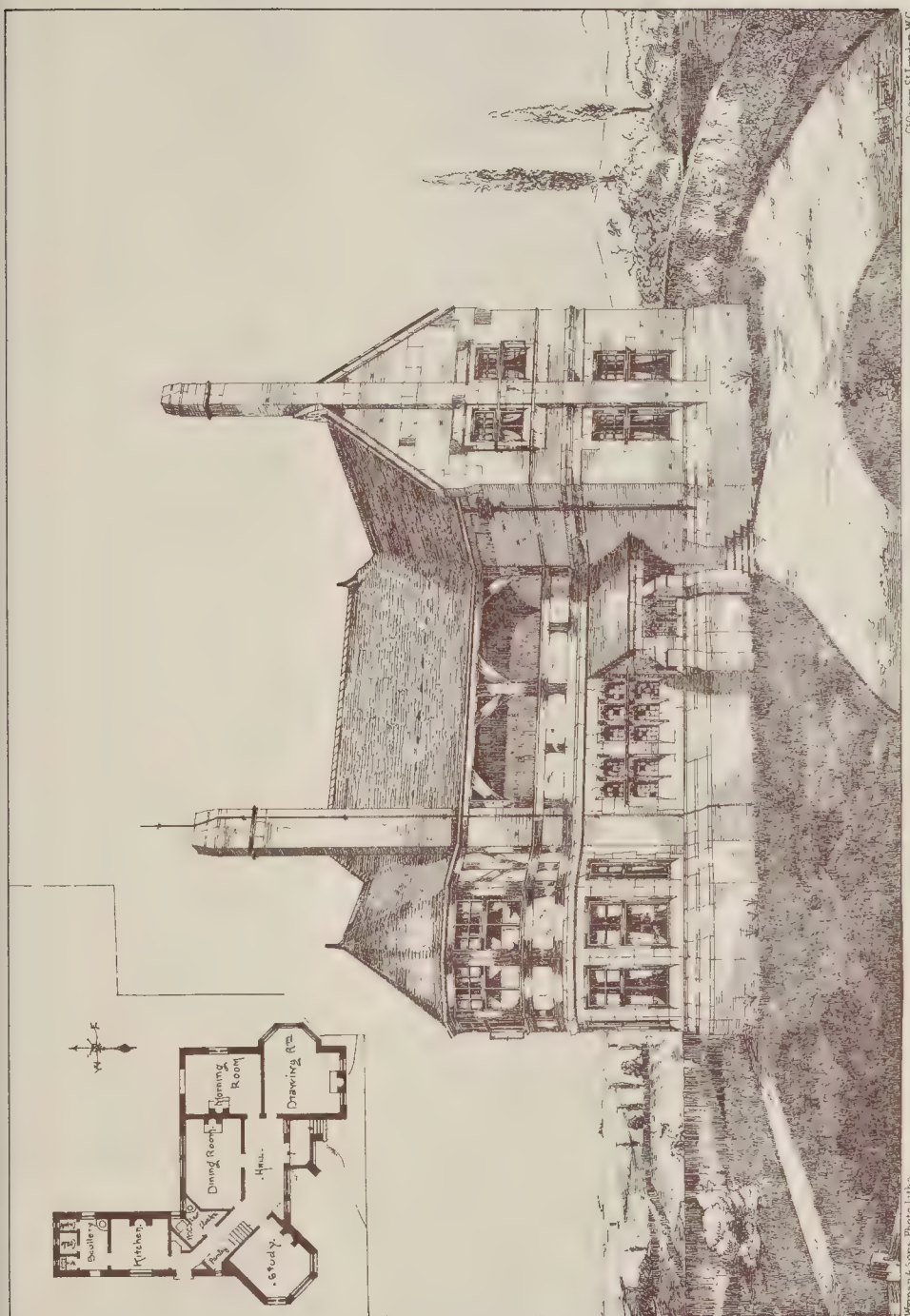


Photo by St. London, W.C.

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HOUSE PROPOSED TO BE ERECTED NEAR EIGHTON. — MR. A. HOWELL, ARCHITECT.

ON THE SCIENCE OF MECHANICS AS APPLIED TO THE FINE ARTS.*

WITHIN the last seven or eight years a great improvement has been made in pointing instruments, and before long the old instrument will have entirely disappeared. The new instrument in its latest and most perfect form consists of two metal tubes, one about 15 in. long, the other about 2 ft. 6 in. The longer one has a strong steel hook at the one end; the other passes through a sleeve on the middle of the other tube, and can be clamped up tight. The short tube has near each end a sleeve which bears a steel point. This part of the instrument is neither more nor less than the T-square I have already mentioned as used in pointing by triangulation. The steel hook can be removed and replaced by a straight point when required; as a rule, it is hooked on to a point assumed on the head of the statue.

On the long bar of this T slides a sleeve, to which is fixed another sleeve at right angles across it. In this second sleeve slides another rod or tube, which in its turn carries another couple of sleeves like those already mentioned, save that the right-angle one is smaller than the other, and carries a smaller rod. At the end of this smaller rod is a ball and socket joint, bearing the sliding needle or pointer described in the scale stone instrument. This instrument is wonderfully light and handy, and very accurate, and can be used with the work in any position. There is one great drawback, however, to these instruments: they will not work proportionally. You can only use them to produce a work on the same scale as the model. But it is often of great convenience for an artist to be able to enlarge from a small design; and much ingenuity has been bestowed on the invention of methods of enlarging and reducing. Every draughtsman is acquainted with the usual old and tedious methods of enlarging and reducing, and the pantograph is so well known that I need not waste time in describing it. Photography has also helped us somewhat, and is quite convenient for making reductions, but not so for enlargements on any considerable scale. For this latter I have recently seen an arrangement which seemed so satisfactory that I asked the permission of the inventor, Mr. Henry Holiday, the well-known artist, to mention it. It consists of a dark room, about 7 ft. square and 10 ft. or 12 ft. high. In the front of this room is an opening closed by a canvas and paper bellows tapering in form, which can be drawn out several feet long, the smaller and movable end of which is closed with a camera lens. This lens and its bellows is supported on a frame which travels backwards or forwards on guides on the floor, according to the distance required. Opposite to the lens a screen is placed, and very strongly illuminated. The sketch or drawing to be enlarged is placed against this screen, but inverted. The bellows is drawn in or out, and the proper focus obtained, according to the proportion required by the artist, who then finds his sketch inside the dark room projected, right-side up, on a paper screen of the size required, and he has only to trace it off. Mr. Holiday showed me several most interesting experiments with this instrument. Amongst other things we enlarged some small photographs of sculpture to full life-size, and the same with some photographs and drawings from nature, and the result was highly satisfactory. The enlargement of drawings, however important it is, is not so serious an affair as enlarging sculpture. This is a subject which has attracted the attention of some of our ablest men. Scores of patents have been taken out for this purpose, and Watt and Chantry are said to have joined forces to effect it, but do not seem to have been altogether successful. The most usual and best-approved plan has been to work with the three compasses, as in ordinary pointing by triangulation, and transferring the measures taken with the compasses on the small model to the larger measures required, by means of the scale of Michelangelo. This scale is formed as follows:—Given a statue of any size, to be enlarged to whatever you like. Draw on the wall, or any other convenient place, a vertical line; mark off on that line the exact length of your large statue. Then take in your compasses the measure of the small statue, and placing one

point of the compass on the point which marks the base of your statue on the large scale, draw a circle with that radius, then draw from the point which marks the top of your large figure a line tangential to that circle, and you have the scale of Michelangelo. If, now, you wish to transfer any intermediate measure, you take such measure in the compasses, place one point on your vertical line, and run it along until you find a point where the other arm of the compass will just touch the opposite line, without crossing it. From the point of your compass on the vertical line to the apex of the angle formed by the two lines of the scale, is the measure required. This system of enlarging is, in my opinion, the usual plan pursued by Michelangelo, and may probably have been invented by him, which would account for the scale bearing his name. But the danger of error is very considerable, for a careless workman taking inaccurately any measure on the small model, transfers this initial error to the large scale, plus any further inaccuracy that may creep in through elasticity of compasses or other causes, and a very slight initial error becomes a very serious one at the last on the large scale. To get over this difficulty many attempts have been made to produce a pointing instrument that should allow no chance of error to the workman, and it was even proposed that he should not even be allowed to cut away the marble, but that the machine should do all. The difficulties in the way of producing a machine capable of turning out a large marble statue from a small highly finished model, were so great that for artistic purposes the attempt has been abandoned. The difficulties were elasticity of material, and wear and tear of tools, and unequal expansion and contraction of parts. These causes were ever at work producing ever-varying results. Still, although these machines would not enlarge satisfactorily, some of them would reduce very well indeed, and when made on a small scale turned out very beautiful work in ivory or similar material. The Colas machine is the best example of this type; I will therefore describe it. It consists of a cast-iron bed on which are two revolving tables. These tables can be placed at varying distances from each other as may be required. They are revolved at equal angular velocity by means of an endless chain. At one end of the bed there is fixed a universal joint, from which proceeds a pantograph suspended by cords and weights from a frame above. This pantograph, being free to move in any plane, and being counterpoised as just mentioned, is used as follows:—The figure to be copied is placed on the table farthest from the universal joint, and securely chucked. The pantograph is set to the proportion required, and the other table is brought into position opposite the reducing point of the pantograph, the chain is tightened up by means of an idle wheel, and the instrument is in order. A block of plaster is now chucked on the reducing-table, and the operator takes in his hand the reducing-point, which is a cutting-point of hard steel, and with it cuts, or rather scratches, away the surface of the plaster block, until the other or enlarging point strikes the surface of the model. He continues this process until there is no more plaster within reach of his cutting-point, and then he makes the tables revolve so as to bring fresh material within reach, and so on until no more remains to be cut away. This seems simple enough, but as he is obliged to work this pantograph in very different planes in order to get at the different parts of the work, the strains on the instrument are constantly varying and materially affect the accuracy of the work. Of course the larger the instrument the greater would be this variation. To get over this difficulty it has been found necessary to restrict very materially the size of the instrument, and also to cut the models in pieces and make the reductions of each piece separately in order to avoid as much as possible the necessity of working in widely differing planes. Yet in spite of all this the result is not altogether satisfactory, even for reductions. Some errors are sure to creep in, in joining up the various parts of the model, and these are almost as objectionable as errors due to the machine itself. I believe this machine to be the best extant, and it has maintained its reputation against all of similar construction for nearly thirty years, but I speak of it from experience.

About fourteen years ago I desired to have a statue I had just completed reduced to half-

size for bronze casting. I accordingly sent a plaster cast of this statue to Paris to the patentees, keeping a cast out of the same mould myself. In due course the reduction was sent to me, but it did not look quite right. I did not know what was wrong, but I was not satisfied. I called in a brother sculptor, and he also noticed the difference. We held a consultation and decided to test this reduction by the scale of Michelangelo. We accordingly projected the scale on a slate table and found that the scale of the reduction was not only not 1 to 2 as ordered, but that the small model did not agree exactly to any particular scale; in short, it was as full of small errors as any fairly good freehand copy would have been. Of course under these circumstances I declined to pay more than the ordinary value of a hand copy, and the result was that I paid that amount, and they took it, and did not fight, knowing the result would be to depreciate the value of their machine if they brought the case before the courts. Two or three years ago some Frenchmen had an instrument in Regent-street which was merely a large Colas machine, neither more nor less, which they were endeavouring to use for enlarging sculpture, and were desirous of getting up a company for the purpose. The project was absurd, and the machine quite incapable of doing very accurate work. There is no existing machine that does; but although it is very difficult to make a machine that will carve on a large scale, it has always seemed to me that it would be very possible to produce an instrument that would take all the responsibility of measurement off the hands of the workman, an instrument which could be set to any scale, and which should tell the workman exactly where he had to cut away the marble, and exactly how much. I often talked over this project, when I resided in Rome, with my friend, Mr. Cardwell, the sculptor, a very able mechanic, and he made some attempts at the construction of an instrument of this description, but was not very successful, except in so far as to show the difficulties as well as the possibilities of the undertaking. This was about eighteen years ago. Five or six years ago I again turned my attention to this subject, and at last succeeded in producing an instrument which I named the Iconograph, but which my workmen christened "Polly," a name which has stuck to it. Polly, then, in whose construction I received much assistance from my friend, Mr. W. C. Prescott, and from Mr. Benjamin Baker and Mr. La Trobe, was made on the following plan. It is well known that if a triangle be divided by a line parallel to its base, the smaller triangle thus formed will be exactly proportional to the original. This is the principle on which my machine is constructed. It consists of an iron bed, like that of a lathe or planing-machine, bearing two saddles, which can be clamped fast in any part of the bed, according to the proportion required. These saddles are made to carry turntables, moving with equal angular velocity in a horizontal plane, the movement being communicated by means of an endless steel band, at high tension, so as to preclude all possibility of slip or backlash. This is, so to speak, the foundation of the instrument. At the left-hand end of the bed, which is 13 ft. long in the clear, is a head-stock. This is simply another lathe-bed, but vertical instead of horizontal, and about 7 ft. high. A sliding poppet works up and down on this, and can be clamped up at any part of the head-stock. A steel tube, carefully and accurately turned up, is suspended, by means of pulleys and counterweights, from the roof of the workshop or other fixed point, and one end is fast in a universal joint fixed to the sliding poppet before mentioned. This tube is about 12 ft. 6 in. long by 3½ in. diameter. The tube is so arranged that, though fixed at one end to the head-stock by the universal joint, it has perfectly free motion in every other respect, and can be freely rotated around its own axis. It carries, also, two sleeves, which can be clamped in any position, and each sleeve bears a pointer. The length of the pointers and the position of the sleeves on the bar being regulated according to the proportion required. The pointers are connected together by a light bar, and can be traversed laterally. This instrument, when once adjusted, is wonderfully delicate and accurate. Too delicate, indeed, for I found that the sun, which during the summer months visits my studio for an hour or so every afternoon, took the unwarrantable liberty of interfering with my work by expanding the tube or

* From a paper by Mr. George Simonds, read at the Civil and Mechanical Engineers' Society, on the 16th inst. See p. 81, ante.

bar of the machine: so I had to have a curtain to keep it out, because as the rays did not strike the bed the upper and lower parts of the machine would be no longer in unison. Getting these parts in perfect unison is one of the difficulties of setting this instrument. In order that the instrument may be perfectly adjusted, the axial line of the bar must be exactly intersected by the longitudinal axis of the two pointers. The axial line of the bar forms one side of a triangle, of which the axial line of the enlarging pointer forms the base, and the other side of the triangle is formed by a line drawn from the extremity of the enlarging pointer, or rather of its axial line, to the point of rest of the universal joint, through which of course the axial line of the bar passes. The lengths of one side of this triangle and of its base are, of course, constant, but as the base has free lateral motion in one plane, the length of the other side of course varies as the angles vary. Now the second, or reducing pointer, is only the line intersecting the triangle parallel to its base: all that is required of it is that it should, with its longitudinal axis, exactly intersect the axial line of the bar, and touch with its point the line forming the other side of the triangle. It must also have the same lateral movement as the other, and move at the same rate of angular velocity; also, to ensure accuracy, the axes of motion of the two pointers must be absolutely parallel with each other, and must accurately intersect the axial line of the bar.

As to the lower part of the machine, the centres of the tables must be in such a position that when the bar is placed horizontally over the central line of the bed, the intersection of the axis of the pointers and the axis of the bar will be again intersected by a vertical line, projected from the centre of each table. The instrument being in adjustment the workman places his model on the table nearest the headstock, chucking it as near centrally as may be, the block of marble being chucked on the other table. The enlarging pointer is furnished with a sliding needle regulated by a stop. It can be entirely withdrawn, but cannot be protruded beyond its required length. In practice the workman withdraws this needle and places the reducing pointer on any required point on the model. The thin slides forward the needle of the enlarging pointer until it strikes the surface of the marble, he can then see at a glance the direction in which he has to cut, and the exact quantity of material to be removed. He has no measurements to take, and no calculations to make. A man working at this instrument with a boy to help him has taken as many as forty points in one hour. Ten points with the compasses would have been fair work. This instrument though good enough, is only a measuring machine. It does no work, and we greatly need some good mechanical means of roughing out. An artist's time should not be wasted on this work, but it is difficult to obtain, and costly to maintain, an efficient staff of workmen for this purpose. If, together with a measuring machine, some form of rock-drill could be used, it might be possible to dispense with skilled labour for roughing out, and the sculptor might almost reach the envied condition of his brother artist, the painter, who is able to do all his work with his own hands.

It is obvious that in a short paper like this it is impossible even to enumerate the half of the ingenious mechanical contrivances which have been invented for the benefit of the arts, or even the less numerous names of those engineers who have also been artists. The subject would require a good-sized volume, and would, I think, prove interesting reading. I have merely attempted to skim over the surface of the subject, but if I have not proved that engineers ought to be artists, at least I trust I have shown that artists have much to gain by studying the science of mechanics, and by frequenting the society and cultivating the friendship of civil and mechanical engineers.

Sections of Ironwork.—Messrs. Bailey, Toms, & Co. send us their very useful quarterly sheet of lists of sections and figured sizes of the angle and T-iron made by their firm, constituting a table of reference from which architects and engineers may see at a glance what sections of their make exist, and avoid the expense and delay arising from specifying sizes which have to be rolled specially.

THE IONIC MONUMENT AT XANTHOS.

PROFESSOR NEWTON, C.B., Keeper of the Greek and Roman Antiquities in the British Museum, took this as the subject of the third of his present course of seven lectures on the monuments of Lycian art,* which was delivered on the 18th inst. in the Botanical Theatre of University College. He observed that this monument was, undoubtedly, executed at a period considerably later than any of the Archaic monuments which he had previously described: how much later was a question for consideration in the present lecture. The monument had been called by various names, since its discovery by Sir Charles Fellows, to whom was due not only the merit of having discovered the monument, but of having measured all the fragments of the building and put them together in a restoration, a model of which exists in the Lycian Room of the British Museum. The remains of the monument were found, Sir Charles Fellows told us, rather less than half a mile to the east of the Acropolis of Xanthos. It stood on an eminence overlooking a plain, and at the time of its discovery† all that was remaining was a base made of the coarser stone of the country, of built-up masonry-work, upon which had stood the monument proper, which was in marble. When Sir Charles Fellows found the monument it was in fragments, as before stated, having been thrown down, probably, by an earthquake. He had these fragments packed and sent to England, and they are now to be seen in the British Museum. The monument itself was in white marble, and it was interesting to us not only on account of its own peculiarities and merits, but from the fact that it throws light indirectly upon other great sepulchral monuments, and particularly upon a great monument of a province bordering upon Lycia: he referred to the Mausoleum at Halicarnassus in Caria, regarding which we knew several important facts, although we were left in conjecture as to a great many points. We knew, for instance, the subject of the Mausoleum. We knew that it was erected in honour of a great Carian prince, about the year 353 B.C. We knew the names of five of the artists who were employed upon it, and we possessed a great deal of its sculptures. On the other hand, unfortunately we had not yet any really reliable data by which to reconstruct it, except a few notes and measurements from Pliny and a certain number of architectural members, but we did not really know the position of much of the sculpture. Now the monument at Xanthos seemed to be able to throw light upon just the points at which we were at a loss in regard to the Mausoleum. We knew, for instance, within a very little, probably, the exact size of the base of the monument, and we had the columns, with their capitals and bases. We also knew the exact positions of the columns on the stylobate, with the positions of the intervening statues: consequently we knew exactly the intercolumniation of the monument. Again, the positions of the two sculptured friezes at the base of the monument, of the frieze above the columns, and of the one running round the inner walls of the cella, were ascertained. In the case of the Mausoleum, we did not know the height of columns, the width of the intercolumniations, and the positions of the friezes. When Sir Charles Fellows first published his "restoration" of the monument at Xanthos he called it an "Ionic trophy," and his idea was that it was a monument or trophy to commemorate the victory of Harpagus, the general who was sent by Cyrus to take Xanthos about the year 540 B.C. That notion, however, had long been abandoned by all archaeologists, and that for several reasons. In the first place, such a structure could not by any possibility have been erected until long after the time of Harpagus; secondly, it was not a trophy, but a tomb—a tomb which was, no doubt, specially intended to commemorate the exploits of some particular person or persons, but there was nothing more remarkable in that than in the dedication of the sumptuous edifice at Halicarnassus to one man. Proceeding, then, to regard the monument at Xanthos as a tomb, it was to be observed that it was a tomb abundantly decorated with sculptures in marble, which was certainly not the marble of Lycia. Some said it was the marble of Paros, an island a considerable distance off; if so, there

was a presumption that the personage whom the tomb commemorated was somebody of considerable importance to Xanthos, for whose tomb the marble was imported from a distance at great cost, as was said to have been done in the case of the Mausoleum. Who, then, was the personage commemorated by the tomb at Xanthos, and what was the date of the monument? These were questions which he reserved to the end of the lecture, and he would therefore proceed to speak of the several sorts of sculpture which the monument exhibited, a further acquaintance with which could only be formed by examining them in the Lycian Room at the British Museum, where they were all arranged, as well as he had been able to arrange them. Though their present arrangement was far from satisfactory, their arrangement in the old Lycian Room was infinitely worse. If they were now in a Procrustean bed, the Procrustean bed whence they had been taken was much narrower and less suitable than the one in which they now rested. These sculptures from Xanthos might be classed as reliefs and as figures in the round. He was, of course, unable to exhibit in their full sequence, any of the friezes which surrounded the monument, so he was obliged to be content with showing casts of the most notable portions of them, together with casts of two figures in the round. In the different reliefs the differences in scale, in treatment, in subject, and in application, were these—first, there were the two friezes running round the base of the monument, of which the broader was lowermost. A third frieze was placed above the columns, instead of an architrave. This was an unusual feature. Within the monument, running round the interior of the cella, was a fourth frieze. Now this and the two uppermost of the three external friezes were narrower and poorer in execution than, and presented different subjects to, the lowermost external frieze. This latter frieze might be said, in general terms, to represent a battle,—perhaps between Greeks and Asiatics. There was, unfortunately, nothing to mark the sequence of the separate slabs, because, both in this frieze and in the friezes above, each group of figures was finished on one slab, and the figures were not run on over the joints of the slabs as in the case of the Parthenon frieze. The sequence of the figures on these larger friezes from Xanthos was thus quite a matter of individual judgment, except in the case of the angle-blocks. As regarded the upper frieze, however, we got on better. There could be no doubt that the subject of this frieze was the siege of a city. The first interpretation of this frieze was that it was possibly a representation of several sieges. The lecturer thought that idea was now given up, but he thought it might fairly be assumed that it was a representation of different phases or stages of one siege. The best account of these sculptures generally was to be found in a memoir by Professor Michaelis, printed in the *Annali of the Roman Institute*,* to which the lecturer referred those who wished to follow out Michaelis's admirable description of these friezes. In general terms it might be said that there were four scenes on this upper frieze. On one of the longer sides is a great battle,—not a battle between horsemen and foot-soldiers, as on the broader frieze below, but a battle of infantry against infantry, and, according to the arrangement adopted by Professor Michaelis, partly based on the restoration by Sir C. Fellows. In the centre of the composition are groups of men mixed in the general way, and great bodies of troops marching up in regular military order from the two ends. On one of the sides, a cast of which was exhibited, we see the attack on a gateway, which was protected by a flanking tower on one side, and on the other side by a singular kind of outwork, which seemed to be detached from the main wall and the towers on the main wall. On another side is the blockade of the city. The battlements of the walls are seen, with the heads and shoulders of the soldiery above and between them, several distinct lines of wall being shown, within and above one another. At one end was to be seen a man approaching, with pacific demeanour, with a led horse, and figures were seen apparently in conversation with the soldiers, as if discussing terms of capitulation. The whole series of frieze sculptures seemed

* "Il Monumento delle Nereidi e i Rilievi." Memoria di A. Michaelis. (*Annali dell' Istituto di Corrispondenza Archeologica*. Anno 1875.)

* See *Builder*, p. 62, ante, † In 1838.

to represent an interesting series of events, and they were also of interest on account of the glimpse which they afforded of the appearance of an ancient city. The frieze which occupied the place of the architrave, and the frieze which ran round the interior of the cells, were smaller and inferior in execution to the one just described. One of them represented, apparently, a banquet and sacrifice, while the other seemed to have reference to certain festivals which were supposed to have been in honour of the man commemorated by the monument. The frieze inside the cells seemed never to have been finished, but some of the figures which it contained curiously resembled some of those on the eastern frieze of the Parthenon. Proceeding to speak of the sculptures in the round, some of which were placed on the floor of the Lycian Room of the British Museum, and others in positions upon that portion of the building which had been restored with the view of showing the original relations between the statues and the pairs of columns between which they stood, the lecturer observed that, as would be seen, the intercolumniation was exceedingly wide,—what architects called "aristyle." The figures filled up the spaces between the columns in a manner exceedingly graceful. What were these figures? They were, without much doubt, Nereids, or sea nymphs,* but they were all represented as being in more or less rapid motion, as if agitated and disturbed by some untoward event. Their rapidity of movement was rendered the more striking in contrast to the steadfastness of the columns, and the whole composition was one of those precious bits of architectural rhythm of which the Greeks were such masters. The figures had their vestments clinging to them so closely as to show the form underneath with remarkable distinctness. This was a method of treating the drapery which was more and more adopted from the time of Pheidias onward to the time of Scopas and Praxiteles. The figures were, as might be expected, small and lithe, and suggestive of having been modelled from a painter's representation of a Greek chorus. He had assumed all along that the monument was commemorative of one man, and he was confirmed in that view from the fact that one of the pediments (of which there were two) was filled with sculpture which might very readily be taken to represent the apotheosis of the hero. But the identity of this hero was a question intimately connected with the date of the monument. Dismissing altogether Sir Charles Fellows's suggestion that the monument commemorated the prowess of Harpagus, seeing that the style of the sculpture rendered it improbable that the sculpture was anterior to the year 400 B.C., the lecturer proceeded to say that from architectural and numismatic evidence, as well as from a fragment copied by Theopompus, preserved by the Byzantine *avant*, Photius, he was inclined to conclude that the monument commemorated the taking of Telmessus, on the Lycian coast, by one Pericles, and if he were right in that conclusion the monument could not be placed earlier than the year 360 B.C.

THE PROPOSED MERCHANDISE EXCHANGE AT BERLIN.

THE political unification of the German Empire has been followed by a gradual centralisation at Berlin of business in many branches of industry. The geographical situation of that city has favoured its commercial development, it being on the direct way from many important manufacturing centres to parts whence merchandise is shipped to all parts. In 1882 the project of a textile exchange was brought forward by those interested in that branch, but, from the want of sufficient co-operation and the consequent lack of funds, the idea had to be abandoned so far as that particular form was concerned. It has now been revived upon the basis of a more extended organisation in which other branches would be associated with the textile trade, which will, however, occupy the

leading place amongst the various sections of Berlin commerce which it is thus proposed to group together.

Various projects of the most eminent local architects had been under the consideration of the committee. The selected plan is that of Herr Guthmann, which has been chosen (according to the *Central Blatt für Textil Industrie*) on account of its not only defining the architectural features of the work in question, but also comprising a scheme for the financing of the project, the latter being founded upon the absence of pecuniary guarantees on the part of the mercantile body, whose moral support alone is demanded.

The proposal of Herr Guthmann embodies the rebuilding for the purpose indicated, of a house belonging to Dr. Evers, situated at the corner of the Conradsstrasse and the Burgstrasse, in the immediate vicinity of the Stock and Grain Exchanges. The owner proposes to effect the alteration into a Merchandise Exchange for his own account by the intervention of a company, provided that the body which officially represents the commerce of Berlin will acknowledge the new Exchange as such and will undertake its supervision. It is also proposed for three delegates of the Exchange Committee to act on the board of the Company to be formed. At a preliminary meeting, held on December 17th, these proposals were agreed to, and the matter was referred to the official body alluded to, with the suggestion that a price might be fixed at which the mercantile body could eventually purchase the building.

The new structure will have a principal room 150 ft. in length and 50 ft. in width. It will be lighted from above and surrounded by 204 stalls, equally distributed between the ground-floor and two galleries. There will also be 125 compartments for keeping samples, &c.

The whole of the premises will be illuminated by electric light, and a central system of heating will be adopted.

THE TECHNICAL SCHOOL AT CREFELD

THE above building (inaugurated on the 15th of December) has been erected upon a scale of completeness not yet seen in establishments of this kind, and in accordance with its object, which is the practical illustration of all manufacturing operations connected with the textile industry. It is situated in the southwestern part of the city, and is accessible by wide streets. The architect is Herr Burkart, of Crefeld, and the execution of the work has occupied more than three years.

The principal building is two stories high, and there is a weaving-shed between the two wings. The façade of the front is 190 ft. in length, and that of the wings 180 ft., with a depth of 38 ft. On the ground-floor is the residence of the official in charge, instruction-rooms for the weaving school (two for decomposing tissues and two for lectures), library, reading-room, physical cabinet, and, finally, the dyeing and finishing school (instruction-room, private workroom, chemical and dyeing laboratories, dyeing-room, and finishing-room). On the first floor are the large designing-rooms, different apartments connected with the museum, the director's residence, offices, &c. The upper story is arranged for a number of different workrooms. The weaving-shed has an iron roof, and occupies a space of about 8,400 square feet. The entire building is illuminated by electric light. The weaving, dyeing, and finishing rooms, as well as the laboratories, being heated by steam. There are two boilers for supplying the necessary motive force.

The building is constructed of brick, in the Early Renaissance style, and its effect is heightened by the introduction of hewn stone as well as by the arrangement of the windows, and by the prominence given to certain portions of the structure. The internal fittings are equally solid and appropriate. The *Cologne Gazette* states that the building alone has cost about 24,000*l.*, which sum was voted by the Landtag. The site was the gift of the town of Crefeld, which also contributed 7,000*l.*

Mr. Elliot Stock announces an edition of "Gray's Elegy," with illustrations taken principally from the scenery round Stoke Poges, and with facsimiles of the author's early MS. copies of the poem.

THE SECOND EXHIBITION OF DESIGNS FOR A MONUMENT TO VICTOR EMMANUEL.

FROM A CORRESPONDENT.

As the readers of the *Builder* are aware, the first competition for the great national monument to the memory of Victor Emmanuel, to be erected at Rome, was without practical results. The first prize was accorded to a foreigner, the sculptor Menot, although his design was declared impracticable for execution; but this first attempt has, to some extent, cleared the ground. Out of all the possible and impossible proposals a few useful ideas had been selected, especially from foreign artists, and they were used in drawing up a kind of programme for the second competition, which erred as much in point of stringency as the former had been found wanting in this respect, but which kept the imagination of competitors within strict lines. In the first place, a fixed site was determined upon, namely, the slope of the Capitoline Hill looking down upon the Corso, and crowned by the Church of Araceli and a Mediaeval monastery. The component parts of the monument and, to a certain extent, its size, were also laid down. The centre was to be an equestrian statue, to which large flights of stairs, 27 metres high, were to lead up, the background being formed by a kind of architectonic screen, also of a fixed height. The competition was again international, but, after the experiences of the first, foreign artists were reluctant to come forward, and only about half-a-dozen have taken part in the second competition. There were altogether close upon a hundred competitors, but the result of their combined labours and imagination is again a failure.

Nine rooms of the new art exhibition palace in the Via Nazionale are filled with the models (each 80 centimetres high) in gypsum of the equestrian statue. Behind each of these are hung on the walls the architectural sketches, views, and plans; some of the exhibitors having gone to the not inconsiderable expense of reduced representations of the whole monument. The first impression of this performance of modern Italy is extremely disappointing. Italian art has succeeded in showing how far the ludicrous can be carried in the representation of a national hero. The personal appearance of Victor Emmanuel was, as every one knows, not modelled on lines of plastic beauty; but the figures which beset the manner of four-footed creatures are, many of them, little better than caricatures. Many of the horses are not above the level of a journeyman's handiwork. Honourable exceptions are few in number, amongst them being some statues by V. Martinucci, one by C. Müller, and one by Ezekiel, the American sculptor.

In the case of the Italian national monument the principal stress is laid upon the architectural additions. Many models of the equestrian statue are only roughly sketched, and the artists may have thought that much could be improved in the execution. On the whole, the architectural portion of the designs shows much greater care. But if we examine them more closely as to their artistic worth, we find that in this portion commonplace in art is as rampant as thoughtless copying of the natural appearance is paramount in the sculptural portion. Whole square acres have been covered with empty flights of stairs, the naked silhouette of the well-known triumphal arch rising above them, only distorted, squat, heightened by arches tilted on the top of it, disfigured by semicircular niches. Now and then the Corinthian or Ionic portico makes its appearance. As a change, one of these porticos, in a very expensive model, is supported on an arch below it. In another case, the façade of a railway station or a glass-covered hall, cut through the centre, for tropical plants, serves for a background. Only a few designs are above the average. One of these is a columnar monument, rendered very attractive by its simplicity, by E. Ferrari and Pio Piacentini, the effect of which is certainly fine. Amongst other good designs may be mentioned a neat Corinthian hall, with attic, by G. Sacconi; a monument by Trabucco in the classic Roman style, well thought out, of which a very captivating drawing is exhibited; and finally, perhaps the most original, a design bearing the motto "Capitolium," which, however, has one serious fault,—it is said to be by a foreigner.

If the whole experiment is really to serve any

* The lecturer, in support of this view, spoke of the symbols at the feet of the figures, such as fish, sea-birds, &c., and went on to say that it would be interesting, and likely to throw an important light on Greek art, if some competent naturalist would take Professor Forbes's admirable account of the fauna of the Lycian coast and try to identify these symbolic representations by comparing them with the species found off the same coast at the present day.

good purpose, it may perhaps be this, that it may lead to the undertaking being postponed for the present, in consideration for the artistic reputation of Italy. As the Italians are naturally too proud to employ foreign genius for a national monument, the best advice that can be tendered them is to agree to a postponement of the undertaking, until a time arrives when the artists of modern Italy are abreast of the present standard of the European art-world.

ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on the 18th inst., Mr. Cole A. Adams, president, in the chair, Messrs. J. Cottingham, A. E. Smith, W. S. Hill, — Woodroffe, G. Cole, W. Elliman, and C. Beapre were elected members.

Mr. Appleton, one of the honorary secretaries, announced that the first Saturday afternoon visit to buildings in progress would take place this Saturday, the 28th, to the new Council Chamber, Guildhall (a view of the interior of which was given in the *Builder* for December last year) and to some new offices recently built by Messrs. Colls in Lime-street.

Mr. Aston Webb then read a long paper on "Plasterwork," in the discussion of which the chairman, and Messrs. Stannus, Trubshawe, Appleton, and H. W. Pratt took part.

THE ARTISANS' TECHNICAL ASSOCIATION.

The first ordinary meeting of this Association was held in the Library of the Social Science Association, Adam-street, Adelphi, on Saturday last, when the Council presented a report of their proceedings, in the course of which they stated that the Association now numbered between seventy and eighty members, from whom the Council had elected the following committees:—

	Hon. Secs.
Finance and General Purposes.....	Mr. C. T. Mills.
Class Organisation.....	W. Trant.
Boot and Shoe Makers.....	A. Hannibal.
Brickcutters and Bricklayers.....	H. W. Richards.
Cabinetmakers.....	A. A. Moore.
Carpenters and Joiners.....	H. Staynes.
Carriage-builders.....	J. Robertson.
Engineers.....	H. J. Spooner.
Masons.....	S. R. Weeks.
Metal Plate Workers.....	C. T. Mills.
Plumbers.....	J. W. Clarke.
Wood Carvers.....	J. Mackie.

The Council hoped to be able to form other trade committees in industries not included in the above list, and those who are willing to co-operate in the work of the foregoing or any committees subsequently to be formed, may obtain information as to the objects and mode of working of the Association from the secretary, Mr. John Channon, 31, Southampton-street, Strand.

The report having been adopted, the Chairman of the Council, Mr. Arthur Harland, A.R.I.B.A., Head Master of the Polytechnic Evening Classes, then read a paper on the work of the Association. He said that about eighteen months ago a committee was formed for the purpose of collecting and formulating the opinions of such skilled artisans as desired to give evidence before the Royal Commission on Technical Instruction. Much useful work was done in that direction, and one result of the labours then undertaken had been the establishment of the Association. The objects of the Association were to encourage "handicraft skill" and "technical training" as the principal means to that end; and they hoped to enlist large numbers of skilled workmen in all departments of trade on the side of honest excellence as against scamping, shoddy workmanship, and all such modern productions as tended to deteriorate skill, encourage dishonesty, and lower productive labour in the eyes of all. In this Association they asked all to work. Trade committees were formed to take in hand the discussion and arrangement of all technical matters concerning their particular trades, and to endeavour to obtain the assistance of the various trade societies in the work. He appealed to all trade unionists to seriously consider whether they ought not to insist on some standard of skill combined with technical knowledge from their younger members before giving them all the advantages of membership. Trade unions would confer a great benefit on the public at large and at the same time

materially improve their own power and influence if they encouraged their members to undertake some sort of technical training beyond that of the workshop. The British workman was blamed for a good deal of bad workmanship which his employer compelled him to execute; and employers found it so much easier to get scamped work executed that some counteracting influence was necessary not only to check the production of bad work, but to encourage and help those skilled artisans who took a pride and pleasure in their work. The exhibition of 1851, and the subsequent establishment of what was now known as the Science and Art Department, gave a great impetus to the study of science and art by the middle classes, but the writer was emphatically of opinion that the results of the thirty years' work of this department were not what might have been fairly expected from the expenditure and the great flourish of trumpets which always accompanied the doings of the department. The first Government School of Design was opened in 1837. An inquiry in 1849 showed that these schools were not working satisfactorily, and they were reformed. In 1853 the department was created, and in 1856 reformed. Various changes, principally of a red-tape character, had been made since. The writer pleaded now for another reform, in order that artisans might more equally obtain advantages which were provided at present principally for the middle classes. Much good could be done by the rearrangement of the syllabus in some of the sciences, by the grouping of subjects in order to encourage young students to take up courses of study, and by re-organising the present system of paying teachers. "Payment by results" was excellent in some respects, but it encouraged "cram," especially in those classes taught by men depending on teaching for a livelihood. Students must be passed, and the routine course according to the syllabus must be gone through. The very questionable methods by which some classes increased their numbers, and the low fees engendered by unhealthy competition, tended to lower classes in the eyes of artisans, and were not conducive to high-class teaching. In the writer's experience students were always willing to pay a reasonable fee for sound instruction from a competent person, and the pauper scale of charges in some local classes could only be due to an inordinate desire to obtain grants, without regard to the time which must be spent by a teacher on a class to ensure the progress of his pupils. A step in the right direction had been taken by the Department in abolishing the small prizes previously given in the elementary stages of science subjects. Classes fostered on prizes or low fees could not be in a healthy condition. The addition of "Hygiene" to the list of subjects, upon which grants might be earned, was to be noted with satisfaction. In connexion with the higher branches of Building Construction the subject of sanitary engineering could with great advantage be introduced; there was probably no subject in which such technical ignorance was daily displayed as in this. Those who had to administer our sanitary laws locally were supposed to be advised by experts on all matters relating to sanitary engineering, but these local bodies often failed to discriminate between impudence and efficiency in their officials. In one case, which was known to the writer, ventilation pipes from a public sewer were made to discharge close to bedroom windows, under the authority of a "local surveyor." The size of drains and sewers afforded scope for the wildest imaginations. Some local "Authorities" required drain-pipes of more than seven times the discharging capacity that was needful. A 9-in. pipe sewer was capable of carrying the sewage of a town containing 10,000 inhabitants, and yet some local authorities insisted on a 9-in. pipe being provided for one water-closet. It would be easy to find cases where expensive brick sewers had been erected in places where a 9-in. or 12-in. pipe would have been far better fitted for the duty required. One could not study the laws and by-laws issued by local authorities without hoping that in the future increased technical knowledge would bring about a more skilled and scientific administration of sanitary laws. There were still great prejudices to be overcome in the matter of encouraging technical skill by means of examinations. The members even of such a useful body as the Association of Public Sanitary Inspectors had expressed themselves in no unmeasured terms against the

necessity of examinations in sanitary science, even so much so as to object to persons who had passed such examinations. A great deal had yet to be done in inducing teachers to make their courses of instruction thorough and systematic. To quote from the reports of the examiners to the Science and Art Department, as contained in the Report of the Department for 1883:—

"The proportion of candidates who show no indication of having been taught at all is larger than it should be" (p. 58).

"It is also no less certain that many of the teachers have not had the opportunity of acquiring sufficient knowledge or experience to enable them to give satisfactory systematic instruction" (p. 62).

"We are inclined to think that many of the teachers might with profit confine themselves to preparing their pupils for the elementary stage only, and entrust their advanced pupils to other hands" (p. 64).

"It is, however, plainly evident that in each year many of the teachers are quite incompetent to teach the subject" (p. 65).

"There are still certain schools in which the whole of the pupils are so ignorant that it is impossible to avoid the conclusion that the teaching must have been of the feeblest character" (p. 66).

Mr. Harland went on to say that a large amount of this so-called science teaching would give place to sound instruction if additional grants were allowed for organising schools and fitting up workshops for practical instruction to take place side by side with the science class. Practical illustration of a theoretical course not only gives the student material help in remembering facts, but it keeps the teacher also, by giving him an additional mode of illustration, and supplying to the student an additional incentive to study, from his being able to see applied in the school workshop what is taught in the class-room. It was, the writer believed, only a matter of time until we should see the properly-equipped technical school, with a staff of practical instructors as well as professors, take the place of the ordinary local science class, as being more suited to the requirements of the age, and productive of more practical good. There was another way in which the Science and Art Department could give great assistance to the objects which the Artisans' Technical Association was seeking to promote, viz., by encouraging annual exhibitions of handicraft skill at the South Kensington Museum, or some similar institution. It was as surely necessary to study the productions of to-day as to gaze on the relics of former times. The inducement of a healthy spirit of competition amongst our artisans would be a great public good. About five years ago the City and Guilds of London Technical Institute established examinations of classes in the technology of various trades. The classes are generally conducted by a committee under the Science and Art Department, and taught side by side with the science and art classes. Thirty-four subjects were now on the list, and in May last 2,397 candidates were examined, and 1,498 certificates were granted. The reports of the examiners showed that these classes were attended by workmen, the greater proportion of whom had had no training whatever in drawing; consequently this movement of only five years' growth had succeeded in reaching students that the thirty years' work of the Science and Art Department failed to reach. This might be accounted for by the fact that the technical teaching under the City Guilds Institute was separate for each trade, and was applied directly to the wants of each trade. The introduction of practical tests into three of these examinations, viz. Carpentry and Joinery, Metal Plate Work, and Weaving, was matter for satisfaction, and it was to be hoped that eventually practical work would form part of the examination in the majority of the subjects, for it was to be feared that technical classes, unless supplemented by workshop teaching, would drift in the same direction as science classes, and become subject to the same unhealthy influences. There was also another serious danger if practical tests were dispensed with,—that of incompetent workmen obtaining certificates from mere book-study. In the subject of Plumbing, for instance, a man might become thoroughly conversant with the nature and properties of sewer-gas, and yet at the same time be unable to wipe a joint and unfit to be trusted with the most rudimentary kind of practical work. It was hoped that the work of the Institute would be gradually extended. Such subjects as Bricklaying,

Cabinet-making, and even Applied Mensuration could be added to the list with great benefit to tradesmen, and it was to be hoped that technical schools would be encouraged to make workshop practice a part of the regular course of training. In pleading for combined mental and manual training he (Mr. Harland) knew that he was running counter to the expressed opinions of a great many people. At the same time, those who were the most staunch upholders of the old system were principally men who had but very hazy notions as to the actual requirements of artisans. He had heard of shoemakers, accountants' clerks, linen-draper, and hosts of others of varied callings, being set down to study "Building Construction" when their time could have been much more profitably employed in studying their own business. It would be far better for men to become "thorough" in the knowledge of their own particular trade before taking up any of the recreative studies which were pressed upon their notice from all sides. The temptations to idleness were so great in all towns that technical teachers had the greatest difficulty in keeping students together for two successive terms. At least three sessions should be passed in class to master even the elements of trade technology. The fact that little was accomplished compared with what might be done, was an additional reason why the work of the Artisans' Technical Institute should be well supported. In the subject of Building Construction as taught in science classes, there were less than 7,000 students (3,258 in last examination) in the United Kingdom. London alone ought to supply that number if it were the custom, and not the exception, for young tradesmen to study technology.

An interesting discussion, of which we postpone our report, followed the reading of the paper.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The fourth meeting was held on Wednesday, the 16th inst., Mr. Thomas Morgan, F.S.A., in the chair. Several antiquities of remarkable interest were exhibited, among which the following may be noted:—A fine collection of drawings of stained glass and paintings, illustrative of the life and martyrdom of St. Edmund, by Mr. Henry Watling, who also showed a collection of views of Elyborough Church. Mr. Danby Palmer described the ancient banner of the Cinque Ports, now in the possession of the Corporation of Romney. It is at least 400 years old, of green silk, and blazoned with the arms of the "Five Ports." It is the identical banner often referred to in the history of Great Yarmouth, as having been borne before the barons when they repaired to the old Tolhouse of that town to meet the bailiffs.

Mr. W. H. Cope described a curious sepulchral sculpture of Romano-Greek work, which has recently been found in some excavations at Mount Ephraim Hotel, Tunbridge Wells. It bears a Greek inscription dedicatory to the god Min; it is of marble, and represents a male figure enclosed in a niche. One of the feet of the figure rests on a prostrate bull. The occurrence of this find in England occasioned much comment.

Mr. Loftus Brock, F.S.A., exhibited ninety-one third brass coins of the Emperor Probus, and remarked upon the great number of coins in existence of this emperor, who reigned but six years. No two were alike in the collection, and yet many hundreds of others are known to be extant. A paper on the excavation of the ancient tumulus at Taplow, by Dr. Stevens, was then read. The writer, who was present, described the position of the grave-mound, within the lines of an old entrenchment of much more ancient date, while around it, as if to mark the continuance of the spot for burials, the more modern grave-yard of Taplow still exists. The interment was reached after lengthy work of excavation, and it was found to lie east and west, although but few human remains existed. From the presence of drinking-cups, shields, dice, &c., the absence of any Christian rites, except the position, the writer concluded that the interment was of very early Saxon date, and that it was of a warrior of distinction, of Fagan times.

An animated discussion followed. Mr. Kemilly Allen pointed out that the gold objects found were ornamented with plaitwork of early character. Mr. C. H. Compton referred to the

early manufacture of horn. Prof. Hodgetts objected to the theory that one of the two shields found had been thrown in by a friend, and referred to its being the second shield carried beside the warrior by his attendant. Mr. C. Brent, F.S.A., showed that the ornaments agreed with others found in early Saxon interments in the South of England.

SOCIETY OF ENGINEERS.

ELECTRICAL ENGINEERING.

The third of a course of lectures on "Electrical Engineering" by Mr. J. C. Fell, M.I.M.E., &c., was delivered on the evening of January 21st, in the Reading-room of the Society of Engineers, Victoria-street, Westminster; Mr. Jabez Church, M.I.C.E., F.G.S., &c., Past President, in the chair.

The lecturer commenced by explaining the effect of external and internal resistance upon the alternative arrangements of batteries in multiple series or in parallel arc. The units of resistance and current strength were explained and defined, and the laws of relative induction of current upon current, and of a magnetic field upon a conductor, were fully gone into. From these subjects the transition was evident and easy to the principle of the generation of dynamic currents of electricity by the movement of a conductor through magnetic fields. Several of the best known forms of dynamo electric machines were illustrated very clearly by diagrams, distinctive types being explained and the chief distinctions pointed out.

The Gramme and Siemens machines were taken as samples of two distinctive types of winding of the armatures, and most of the other machines were classified under these two types.

The points in which economy in construction might be effected, and those by which the wear and tear might be reduced, were not forgotten, and should prove valuable hints to the hearers.

INTERNATIONAL HEALTH EXHIBITION, LONDON, 1884.

WITH a view to securing an interesting and instructive collection for the Indian Court of the Exhibition, the Indian Sub-Committee have prepared a memorandum indicating the class of exhibits they consider most desirable. The object which this committee think should be kept in view in considering the arrangements for the Indian Section of the Exhibition is the illustration, in as vivid a manner as possible, of the actual life of the masses of the people of India, as regards the three special objects of the Exhibition,—their food, their dress, and their dwellings also, but to a less extent, their education. The committee feel that they must not rely solely on contributions from India, but that they must also invite the aid both of traders and of private individuals in India in securing an effective Indian display. They are, therefore, anxious that it should be distinctly understood that applications for space from Indian traders in England will be readily considered, provided, of course, that the proposed exhibits are of a character suitable for the Exhibition. As regards Group 1 (Food), it will be desirable that there should be complete collections of the ordinary food of the people in some selected districts of each principal Province. Where possible, it would be desirable to have the prepared food itself; when this cannot be done, the raw materials and models might be shown. Specimens also of Indian food-stuffs imported into this country are desired, as well as specimens of the various condiments, pickles, preserves, &c., manufactured either for European or local use. Models of edible fruits, especially those known in this country in a dried state, would be useful. Also representations of stuffed specimens of animals used as food. Any illustrations of the processes of preparing rice, tea, coffee, &c., would be welcomed. It would certainly create great interest here if a few native cooks could be brought over, with plenty of materials, who would cook daily, for sale, say a good Mussulman dinner and a good Hindu dinner, with accompaniments such as are used at caste feasts, weddings, &c. As regards Group 2 (Dress), the most important thing will be to show the clothing, &c., of representative classes in representative districts of each province. The dresses should be shown on lay figures, and should be the ordinary habiliments of the people, with their ordinary ornaments. Exhibits illustrating the construction of Indian fabrics, and specimens of any fabrics of special interest, are desirable, also illustrations of silk culture (especially tussur). In Group 3 (the Dwelling), possibly there might be exact models of the better classes of houses in representative districts (say of a cultivator of the better class,—a banker, a shopkeeper), of the cottages of the lower classes,—the huts of weavers, fishermen, &c., of European up-country

bungalows, and of a bit of a bazaar in an up-country town. If, besides the cooks above mentioned, other Indian workmen could be brought over,—potters, blacksmiths, weavers, silversmiths, &c.,—it would form a most interesting feature in this Exhibition, and as illustrating the life of the people of India: possibly not an unsuitable one.

It has been found desirable to enlarge the scope of the Exhibition as regards Ambulance material. A special sub-committee has been appointed to deal with this subject, and they have prepared a memorandum indicating the principal exhibits which it is intended should be comprised within the new group (Group 3a, "Ambulance") which has been formed to receive them. The following is a summary of the principal appliances sought for exhibition:—1. Personal surgical equipment as carried by the medical officers of the army in question. 2. Appliances for treatment of wounds, carried by the soldier himself in the field. 3. Personal surgical equipment carried by ambulance attendants in the field, consisting of surgical haversacks (*haversacs sanitaires*), medicine panniers (*caisses sanitaires*), surgical knapsacks, field companions. 4. Ambulance appliances carried by men, such as stretchers (*brancards*), hammocks, dhoolies, and palanquins. 5. Wheeled conveyances wheeled by men, wheeled stretchers. 6. Ambulance equipment carried by mules, horses, &c., *cacolets, litières*, mountain ambulance equipment (*ambulance de montagne*), cooking equipment for mountain campaigns, portable medicine-chests, compressed drugs, &c. 7. Wheeled vehicles used for the conveyance of sick, *fourgons* containing the equipment of hospital corps, surgery wagons, equipment wagons, field cooking wagons, pharmacy wagons, nursing utensils carried in wagons of field hospital. Books of instruction for use, diagrams. 8. Railway ambulances, consisting of carriages for wounded, with fittings, cooking carriages, and all the equipment of ambulance trains. Materials for converting ordinary carriages into ambulance carriages.

THE LOCAL AND IMPERIAL MUNICIPAL CORPORATIONS METROPOLIS BILL.*

WE are not sure that Mr. Rearden is not indulging in a little good-natured fun in portions of this draft Bill; for we find one clause which deals with the manner in which the Lord Mayor's show is to be abridged, and disposed of, and in another it is provided that any Alderman of the Metropolis who goes as a magistrate shall be liable to a penalty of 500l.

In brief, the main feature of the serious part of Mr. Rearden's scheme is the union of the various fragmentary bodies of the metropolis into ten local corporations. From these ten local corporations an imperial corporation is to be elected.

It is possible to understand the *raison d'être* of a certain number of municipal bodies within the total area of the metropolis, but, on the other hand, if these bodies are to be more important and more representative than the present vestries it is difficult to see how an imperial corporation, as Mr. Rearden calls it, can also exist. So far as we see from this Bill the latter will be no more than the body with which the control of the police and the management of the River Thames lies. In spite of the absurdities to be found in this Bill, it is probable that the plan of the metropolis containing several local bodies, in fact a certain number of district corporations, is one which is likely to find a good deal of favour. And there can be no question that there is a good deal to be said in favour of dividing London, say into four self-governing districts. Their effect would probably be more favourable to active local life than the construction of one huge municipality. On the other hand, the difficulty of drawing any dividing line in regard to gas, water, roads, police, &c., is so great that probably the only practicable plan of reform is the creation of a single municipality. We confess we think Mr. Rearden would have done more good by publishing a pamphlet containing well-thought-out arguments for or against the real scheme than by issuing this Bill, which contains so many fantastic views that the more sensible and serious part of it, and the idea which underlies it, will escape the discussion which the subject certainly deserves.

Tatton Hall.—Messrs. Clark, Bunnett, & Co., London, have received instructions to fix one of their patent direct-action hydraulic lifts at Tatton Hall, for Lord Egerton. They are also fixing one of their hand-power invalid lifts at Eaton-square for Lord Erne.

* By D. J. Rearden, Esq. M.P. Published at 81, Mount-street, Grosvenor-square.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Jan. 11, 1884.

- 1,200. P. Scholes, Bury. Construction of fireproof floors, ceilings, &c.
 1,208. A. Kohlhofen and P. Gerlach, London. Heating and cooking stove.
 1,211. E. P. Purkis, Birmingham. Window-blind rollers.
 1,226. J. Relph, Liverpool. Window-blind.
 1,250. I. C. R. Lindenzweig, London. Window-blinds.
 1,258. E. Hill, Sheffield. Construction of roads, pavements, &c.
 1,263. L. Hermanson, Sheffield. Preventing accumulation of dust in corners of rooms, &c.
 1,272. W. H. Tooth, London. Heating rooms and buildings.

Jan. 12, 1884.

- 1,290. A. Foley, Salisbury. Chimney-breasts, grates, &c.
 1,294. C. R. Cowie, Glasgow. Artificial stone. (Comp. Spec.)
 1,311. F. Warne, London. Open stoves or fireplaces.
 1,322. F. Oldfield, Hyde. Sliding windows or sashes.
 1,339. J. Hodgson, Birkenhead. Window sash-fasteners, &c.
 1,349. H. H. Lake, London. Device for securing shutters, &c. (Com. by E. A. Stofft, M. J. Reichermos, and S. Mérandon, Paris.)
 1,372. J. M. Knight, London. Sewer ventilators.
 1,374. E. Howard, London. Water-waste preventing apparatus.
 1,376. P. Jensen, London. Ventilating apparatus. (Com. by J. Keider, Berlin.)

Jan. 14, 1884.

- 1,412. L. Roth, Wetzlar, Prussia. Cement. (Comp. Spec.)
 1,418. G. Brooklebank, London. Preventing air or sewer gas escaping into houses through pipes.
 1,427. T. Brown, Luton. Window sash-fasteners.
 1,439. J. Parry, Birmingham. Self-acting fastener for French windows, &c.
 1,446. S. Bennett, Birmingham. Winding up window-blinds.

Jan. 16, 1884.

- 1,504. F. W. Gerhard, Wolverhampton. Cements.
 1,514. W. Wade, Leeds. Self-adjusting sash-fastener.
 1,517. G. T. Jenkins, London. Regulating the draught in chimneys, and ventilating.
 1,520. B. Haigh, London. Water-waste preventers.
 1,526. C. Kite, London. Silent automatic exhaust ventilator.
 1,538. C. Showell, Birmingham. Metallic sash-lifts.
 1,553. T. D. Griffith, Swansea. Domestic fire-places.
 1,558. R. Wright, Richmond. Preventing smoke in open fire-places.

Jan. 17, 1884.

- 1,588. J. Hummerston, Leeds. Bolt for doors, windows, &c.
 1,596. W. Devoll, Birmingham. Syphon apparatus for flushing closets, &c.
 1,597. W. D. Duncan, Coalbrookdale. Halls and other buildings.
 1,613. C. Kite, London. Automatic downcast inlet ventilator.
 1,630. T. Sanders, Birmingham, and T. Stubbs, London. Window-fasteners. (Comp. spec.)
 1,636. H. W. Hart, London. Laying bricks.

NOTICE TO PROCEED

has been given by the following applicant on the date named:—

Jan. 18, 1884.

- 4,488. W. M. Simons, Nottingham. Roller-blind furniture. Sept. 20, 1883.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the week ending January 10, 1884.

- 2,444. H. Charters, London. Fasteners for windows and casements, &c. May 15, 1883. Price 2d.

ed or sash is a spring, and, when the fastener is turned, it actuates this spring, which shoots up a bolt, thereby locking the fastener. (Pro. Pro.)

* Compiled by Mart & Co., Patent Agents, 138, Fleet-street.

- 2,507. A. Diss, West Bergholt. Construction of chimney-pieces, and ornamenting and fixing the same. May 19, 1883. Price 2d.

These are made with a cast-iron frame filled in with ornamental or other tiles, &c., and are attached to the wall by a projecting dowel, in which a screw, inserted through the side of the pilaster, enters. (Pro. Pro.)

- 2,522. A. Snelling, London. Cows for chimneys. May 21, 1883. Price 2d.

A section is produced by the rotation of a drum provided with curved vanes on the chimney-tops. (Pro. Pro.)

- 2,535. F. H. F. Engel, Hamburg. Manufacture of artificial stone. (Com. by E. Marjalin, Hamburg.) May 21, 1883. Price 2d.

This stone is made from clay and peat, dried, then pulverised, and pressed in moulds.

- 2,576. J. Garlick, Birmingham. Construction of floorings, platforms, dados to walls, framings of doors, &c. May 23, 1883. Price 6d.

These are made of thin layers of wood cemented together, grooves and corresponding longitudinal projections being made in their meeting faces.

- 2,601. A. Clark, London. Fireproof screen or shutter for separating the stage from the auditorium of theatres. May 24, 1883. Price 6d.

This is a rigid screen formed of a double skin of iron or steel plates secured on a frame-work, the space inside being filled with water or asbestos, &c. It is fitted to slide between two uprights, and is lifted or lowered by two hydraulic rams.

- 2,613. F. Newman, Ryde. Traps or appliances for flushing and inspecting drains. May 25, 1883. Price 6d.

A conical valve is fitted above the trap, the rod of which comes up to the grating above. When a flush is required the valve is closed, and the water collects above the same when the valve is lifted and the flush is effected.

- 3,078. C. J. Henderson, Edinburgh. Abstracting heat in large quantities from stoves, &c. June 21, 1883. Price 2d.

A stove is enclosed by a casing, and a current of air is passed in between the outer surface of the stove and the casing to abstract the heat.

WHAT ARE THE NEW WAR OFFICES TO BE BUILT OF?

SIR,—The time is now drawing near when the first elevation of the War Offices will be submitted, and the question is constantly being asked, with what stone will it be built?

Can the Government see their way to give us one fine building from the igneous rock? The expense will be very great, but will, I believe, be cheerfully borne, as for all time it will defy the storms and the weather.

If not granite, of what is it to be built? It will not do to repeat the experiment of the Houses of Parliament.

From my knowledge of the building stones of London, or for London, no other stone at present in the market can take rank with Portland. Of this, also, there should be a selection.

The latest public example warrants me in saying that the selection of the above should not be in the hands of the builder, and its rejection in the hands of the clerk of works, but its selection should be in the hands of the clerk of works, who should himself be started as soon as possible to select the stone, so as to secure uniformity of colour. Also to allow the sap to go clean out of it before it is used.

If we are to have stone, let it be the best of its kind, and prepared in the best way to give satisfaction.

H. M.

CLEARING AWAY POOR TENEMENTS.

SIR,—At a time when the difficulty of decently housing the poor is agitating, the public mind, and even the "drum ecclesiastic" is being somewhat wildly beaten in the turmoil, it strikes me that the honourable profession represented by your journal might do much to help in the matter.

Railway companies and other undertakings have almost stopped clearing away houses and making wastes in the densely-inhabited districts of London, the expense of the operation being prohibitive, but the London School Board still continues its devastating course, and yearly demolishes 700 to 1,000 dwellings and other houses for its new buildings, and as the former number is noted for destruction in the coming session, there seems little hope of cessation. The question then arises, could not a less extensive clearance be made to serve, if careful plans and special designs to that end were prepared? If model lodging-houses can be made to pay by using small sites for tall buildings, cannot schools be constructed of moderate areas

and in several floors? If not, there is little hope of improvement, but rather a yearly increasing evil, with heavier taxation to embitter it.

INQUIRE.

* * * Our correspondent seems quite blind to the fact that the most effective agency, in the long run, against poverty, vice, and misery, is the education which these same school buildings are intended to furnish opportunity for.

SALFORD SEWERAGE WORKS.

SIR,—The letter of the Borough Engineer of Salford, which appeared in your last issue, does not, I contend, answer my statement of facts. To speak of advertising is quite beside the subject.

Mr. Jacob is silent on my work of constructing the outfall sewer, and ignores the other important points I have raised. Of course it is my contention that my design has been tampered with and altered, and the cost thus increased from about 40,000*l.* to 100,000*l.*, as also the working expenses, by reason of the increased lift of 27 ft., which must necessarily alter the drawings, whilst, to use Mr. Jacob's own words, "preserving the general principles of the scheme." And all this extra cost of interest on capital and working expense, amounting to some thousands of pounds per year, over and above that of my own design; and this in the face of the Leeds works being an existing example of efficient working during the past nine years.

In my judgment, the elaboration of the buildings and the raising of the sewage to a height of 43 ft., are simply a monstrous waste of money.

To say that the extra height was necessary to utilise the water flowing from the tanks (to drive a mixing-engine or some such machine) is simply to say that a waste of power was necessary, and does not require comment from me to convince any engineer of the folly of obtaining motive power by such means.

It can well be understood, now that Mr. Jacob is answered, that he should wish for no further discussion.

ALFRED M. FOWLER, Mem. Inst. C.E.

Manchester, January 22, 1884.

THE CONSTANT WATER SUPPLY IN ST. PANCRAS.

SIR,—The New River Company seem bent on irritating the people whom they supply with water. Some two or three years ago a mandate was issued compelling every house to be supplied with a screw-down tap to the water-pipe on its entrance into the house; new taps also everywhere, in accordance with the dictates of the officers of the company, were ordered to be substituted for those already in existence, regardless of expense or convenience, under a penalty for non-compliance. Now, again, a man knocks at the door, and, like a sheriff's man, bolts into the house, takes a hasty glance at the cistern, and forthwith jots down on an official paper certain "requirements" for the constant supply in the shape of pipes and taps of the most expensive kind, without descending to observe that some of these things were done on the previous occasion on their own approval and have not been touched since. The screw-down tap at the entrance, and the waste-pipe disconnection, for instance, are *in statu quo*, and though all the pipes and taps are in good condition, they are ordered to be replaced by others. Besides this, a new pipe from the main is demanded, in some cases 30 ft. in length, instead of the existing pipe, which is as sound as ever, and requiring the road to be broken up, with all the concomitant expense of plumbers and excavators, which few house-owners who have once experienced this would like to incur the second time in a hurry.

Now, sir, there are many hundreds of working men in St. Pancras who live in their own houses, having borrowed the purchase-money from building societies, whom they are endeavouring with frugality to pay off; and to these this fresh demand is a burden scarcely to be borne. Equally so to numerous others, small house-owners, whose living depends on the value of their properties in the parish, the mandate reads like wanton waste of labour and material, and a penalty inflicted for daring to question the charges lately so much discussed. When the former demands and alterations were complied with, it was understood that nothing more would be required to admit the constant supply, the stop-tap to the entrance of each house being sufficient to regulate the force of water into the cisterns. But now all the expense then incurred is to be thrown away, and the water company, instead of being benefactors, are creating a feeling of irritation and annoyance which is not likely to be beneficial either to them or the public in general. If this unnecessary outlay be the only safeguard against the fact that another decree will not be issued to those who can so ill afford to comply? And thus, while a heavy tax is levied on people who are inordinately taxed already, neither the wrath of the company is appeased nor sanitary advantage given to the poor house-owner who strives to keep his head

ABOVE WATER.

"MYSTERIOUS TENDERS."

SIR,—In answer to "Architect," [p. 115] relative to mysterious tenders, I wish to explain that tendering does not affect architects' calculations in any way. I have had forty years' experience. During that time I have found architects the most accurate in their calculations, exact in their dimensions, and I also find that they do obtain all the local information necessary to lay before their clients the probable cost of works in contemplation.

But there are black sheep in all flocks. For example,—a builder who has no reputation would take work at one-third its value, draw the first instalment, and then make his exit. Another and more honest man is, perhaps, invited to tender. He says, "In order to keep my name in circulation, I will put in a tender, but I do not want the work." Another would say: "It is a doubtful affair, and I am labouring under disadvantages. I will send in a tender that shall be sure of covering all expenses."

Now, sir, I will again try to put into your columns the most just, honest, and fair way of doing work. I have been trying at this many years:—

The architect makes drawing and specification. A practical man will take off quantities and price them, in order that the architect may give an approximate estimate to his client. Then take into consideration the local advantages and disadvantages. If a local man can be employed so much the better, as his character is dependent on his work. Make him liberal advances. When work is finished, measure and value according to the market price of materials and labour in the neighbourhood.

CLERK OF WORKS.

SIR,—Your correspondent, "Architect" in your last issue, has, I believe, solved the mystery of the wide margin between the tenders for "lifting machinery" as well as for other work of like kind seen in your paper. He is right in thinking that if the work were properly specified in detail, such large differences would not occur. Knowing the difficulty some architects have in making their wants known for such class of work, I was led some time since to write several works upon this and other branches of machinery. I feel some delicacy in naming this, but venture to think that a reference to these books would have prevented such very unfortunate results in the tenders received.

I would, however, suggest that the best course to pursue would be for architects, who are not also civil engineers, to procure professional assistance in all such cases, rather than run the risk of bringing the profession into disrepute by undertaking work they do not well understand.

I recommend my professional brethren to adopt my practice, viz., to place detailed drawings and specifications before two or three high-class firms who have special experience with the particular class of work, when a fair estimate of the value of the work will usually be arrived at. Such a course, I am sure, will prove more satisfactory to their clients themselves as well as the firms who tender for the work.

FREDERICK COLYER, M.Inst.C.E.

RAILWAY AND TRAMWAY DEVELOPMENT IN IRELAND.

SIR,—From the note which you appended to the report of my paper in the *Builder* of the 22nd ult., apparently you misunderstood me as to the position of the tramway on the road. My proposal is to lay the tramway with rails of the ordinary modern railway type on cross sleepers; in fact, a narrow-gauge railway laid along one side of the road, having a curb to keep the traffic of the road clear of the vehicles on the tramway. The only traffic crossing the rails would be at the meeting-points of roads, or from gateways on the side of the road on which the rails were laid. Crossings would be made just as level crossings of a railway, wooden guards being spiked down to the cross sleepers. There is nothing new or untried in the plan I advocate. The Wantage tramway was constructed in this manner so long ago as 1875. There the road is wide, and had two footpaths, one of which is appropriated for the tramway. Unfortunately there are many public roads in the undeveloped districts of Ireland which are not continuously wide enough to admit of tramway being laid down in this manner, and therefore land must be purchased to get the requisite room. Here we get into difficulties at once. There is no power under the Tramways Acts to take compulsory houses or outbuildings, yards, gardens, parks, or plantations, or any part of such property. If, therefore, property of this kind borders a narrow road (near towns and villages this will generally be the case), the cost of paving the tramway must be incurred, or the necessary land bought by agreement with the owners, who stand in an advantageous position for making high terms, or

the property must be circumvented, probably lengthening the distance and increasing the cost. The more the recent Act is studied, the more clear does it become that it is doomed to fail as its five predecessors have failed before. The Acts of 1860, 1861, and 1871 were all more or less tentative. Experience of the working of tramways, especially by steam, was then lacking. Now we have ample experience, and the time has arrived for a bold, vigorous, and comprehensive measure dealing with the whole question of procedure in obtaining powers and method of construction of light railways and tramways, instead of further coddling measures like those of 1881 and 1883.

HENRY T. CROOK, V.P. Inst. C.E.I., &c.
Sunbury Gardens, Rathmines, Dublin.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

MURRAY V. PERRY AND CO.

At the Southwark County Court, before Mr. H. Holroyd (the judge) and a jury, this case has been decided, after a hearing extending over two days.

The action was brought by the plaintiff, a carpenter, against his employers, who are the well-known builders, to recover 300*l.* damages, for injuries which he received in falling from a binder upon which he was at work on the 11th of October last. Mr. Clark, barrister, appeared for the plaintiff; and Mr. Hannen, instructed by the solicitors to the Builders' Accident Assurance Company, for the defendants.

The evidence for the plaintiff was to the effect that he was employed by the defendants as a carpenter at the new works at the Waterloo Station, for which they had the contract, and that on the morning of the day named he was instructed by Mr. Henry Buller, foreman, to nail a fillet on to a binder, which was 13 ft. from the ground. No scaffolding was provided, and he was therefore obliged to get on to the trimmer or binder, and to reach over. After a short time he found the binder shaking, and thought he was likely to fall head-first, and to prevent this he drew himself up and placed his foot upon a temporary brace which was attached to the binder. This gave way, and he fell to the ground on his back, the alleged consequence being that he had contracted a spinal affection, and he would not be fit for ordinary work for twelve months. The negligence attributed to the defendants' foreman was that he had not provided scaffolding to enable the fillet to be nailed on with safety, and also that in the ordinary course of the work the fillet should have been placed on the binder before it was put in position.

For the defence Mr. Butler was called and denied ordering the plaintiff to do the work, but stated that with care there was no risk in doing it in the way the plaintiff proceeded, and that the accident arose through his placing his foot on a temporary brace which he knew could not support him. There was no necessity to provide a scaffold, and during twenty-seven years' experience he had never known a fillet to be placed on a binder before the latter was placed in position. This evidence was supported by Mr. Bartlett, a member of the defendants' firm.

The jury returned a verdict for defendants, and costs were allowed.

ACTION AGAINST A DISTRICT SURVEYOR: THE NEED OF PROFESSIONAL ASSESSORS.

BROWN V. KNIGHTLEY.

This case came on for trial at the Brompton County Court on the 14th inst. Generally the facts are as follow:—

In 1880 Brown, senior, gave notice to build fourteen houses, six on each side of Brackenbury-road, and two in roads adjoining. Six of them were finished and one left in carcass. In 1882 Brown, junior (the plaintiff), gave notice to build eight houses, which included the one in carcass; one house named Devon Villa was built next another man's property, and had not a sufficient party-wall. The defendant, who is District Surveyor for Hammersmith, summoned Brown, senior, to build proper party walls, and although Brown, junior, had given notice for the buildings, he acknowledged that he was owner and builder. The summons was heard by Mr. Partridge, who ordered it to be amended. The amended summons was heard before Mr. Shiel, who said it was wrong, and that the original summons was correct, and dismissed it, with costs, against the District Surveyor, the house being, therefore, left without party-wall.

The Metropolitan Board of Works directed the District Surveyor to report on the condition of the fifth house in Brackenbury-road. His report was that it had a very badly-constructed bressummer; that although the house was a carcass only, it had defected, and the front wall had become fractured in consequence. The Metropolitan Board of Works summoned Brown, senior, who denied ownership. Brown, junior, appearing, and claiming to be owner. Brown, senior (who had left the court), returned and said he was the owner. Mr. Shiel disbelieved the statement, and made an order for the unsound wall to be removed. The order not being complied with,

the Metropolitan Board of Works removed the wall. Subsequently the Metropolitan Board of Works directed the District Surveyor to report upon the third and fourth houses in Brackenbury-road. He made a similar report to that which he had made on the fifth house. The summons was heard before Mr. Shiel, who adjourned it, asking the Board to appoint an independent surveyor or engineer to guide him in his decision. The Board refused, having no power to make such appointment. The summons came on, and was dismissed by Mr. Shiel, who said he did not understand such things. Mr. Knightley might just as well be asked to determine a point of law. Each party to pay his own costs.

Brown, junior, thereupon commenced an action against Mr. Knightley for malicious prosecution. The Judge in Chambers remitted the writ to the County Court. The County Court Judge consulted Brown, with costs, observing that if there was any malice in the case, it was the Metropolitan Board of Works that was malicious, and he must go against them.

The District Surveyor, in his evidence before the magistrates, showed a model of the badly-constructed bressummers, and exhibited a drawing showing how they might be strengthened by bolts, they being simply formed of pieces of battening put together with nails, and in defiance of all principles of construction. His evidence was endorsed by that of Mr. Thomas, of the Dangerous Structures Department of the Metropolitan Board of Works, and that of Mr. Reade, an engineer of twenty-five years' practice.

PROVINCIAL NEWS.

Cardiff.—On the recommendation of Messrs. James, Seward, & Thomas, the architects, Mr. Fred. J. Veall (son of Mr. J. R. Veall, architect, Wolverhampton) has been appointed to the post of architectural assistant and clerk of works on the new Exchange Buildings, Cardiff, the first contract for which amounts to upwards of 25,000*l.*, and is to be commenced forthwith by Mr. C. Burton, of Cardiff.

Southampton.—Mr. W. Matthews, of Peterborough, has been appointed waterworks engineer to the Southampton Corporation in the room of Mr. George Manwaring, who, after over thirty years' service, has resigned. There were sixty-one candidates for the appointment.

Salisbury.—Extensive sanitary and other alterations are being carried out at Uplatham Wall, Lord Zealand's marine residence near Salisbury, under the direction of Messrs. Clark & Moscrop, architects, of Darlington.

CHURCH BUILDING NEWS.

Higgin Ferrers.—A new reredos having been placed in the church of St. Mary the Virgin, Higgin Ferrers, and improvements made in the chancel, dedicatory services were held on the 2nd inst. The reredos, which is made of walnut wood, richly gilded, consists of three panels, which were given by the sons and relations of the late vicar, the Rev. G. Malins, the subjects being the Annunciation, the Crucifixion, and the Entombment of Our Lord. The designs, which were by the Rev. E. Geldart, rector of Little Braxted, Essex, have been carried out by Messrs. Cox, Sons, Buckley, & Co.

Macclesfield.—On the 10th inst. a public meeting was held in the Town-hall, Macclesfield, for the purpose of considering two reports received from Mr. Stevens, architect, and Mr. Sherlock, diocesan surveyor, to the effect that the nave of the church was in a dangerous condition. The vicar (the Rev. E. C. Turner) was in the chair, and there was a large attendance. It was proposed by Mr. J. May, seconded by Mr. E. Brodric, and carried unanimously, that the nave should be taken down and rebuilt. This ancient church was founded in 1273 by Queen Eleanor.

SCHOOL-BUILDING NEWS.

Dartford, Kent.—A new infants' school-room and new offices, lavatory, &c., for the other children, teachers, &c., have been added to the parish schools, at a cost of about 850*l.* The architect was Mr. A. J. Style, of Westminster-chambers, and Mr. T. Blake, of Gravesend, was the builder.

Southampton. The new Sunday-school buildings, which have been erected at the rear of Portland Baptist Chapel, were opened on the 8th inst. The building is constructed in a substantial manner, the exterior being faced with white bricks, relieved with Bath stone dressings and string courses. The west front is divided

into three bays, two being terminated with gables, and the centre one relieved with a large and handsome four-light stone oriel window. Mr. W. H. Mitchell, of Portland-street, Southampton, was the architect, under whose personal superintendence the whole of the work has been carried out by Mr. H. I. Saunders, builder, of Northam, with the exception of the gas-fittings, which were entrusted to Messrs. Lankester & Son.

Books.

Dilapidations: a Text-Book for Architects and Surveyors, in Tabulated Form. Third Edition. By BANISTER FLETCHER, F.R.I.B.A., &c. London: Batsford, 1883.

GETTING out the third edition of a book of this sort within a few years of the first publication must inspire the author with a grateful feeling. A good many people have discovered that the great public has a hankering after text-books, handy-books, elegant extracts, compilations, and classics of all sorts for English readers. Mr. Fletcher has, however, hit upon a line of his own. Reports of law cases, extracts from big books, and a good deal of practical experience to begin with, then a filling up of personal and professional gossip; a light sprinkling of moral maxims thereafter completes a text-book of civil dilapidations, fitted specially for "the beginner," and not without its uses for others who like to see at times through other people's eyes.

The definition of dilapidations, which he looks upon as the best for practical guidance, is that in the report of the Committee of the Royal Institute of British Architects, appointed in 1842, and first issued by the Council in 1844:—

"Dilapidations are, in usual practice, considered to be those defects which have arisen from neglect or misuse, and not to extend to such as only indicate age, so long as the efficiency of the part still remains. But if the effects of use or age have proceeded so far as to destroy the part, or its efficiency in the structure, this argues neglect or misuse; it being the presumption that at the commencement of the term the tenant was satisfied that every part was sufficiently strong to last to its close."

The substitution of the word *part* for *part*,—an error which was started in Mr. Fletcher's first edition, and is continued in the third,—has probably caused some puzzlement to a fair number of the "young architects and surveyors" by this time. The report in question will always remain a valuable evidence as to the custom of surveyors, being an able paper, prepared by well-versed and well-honoured members of the Institute, and endorsed by the Council after its presentation in 1843, and formally once more on its republication in 1869. It is to be regretted that some of the useful suggestions made forty years ago have not yet been generally acted upon. In the extract given above it is implied that circumstances alter cases, especially that no one should expect buildings to be fresher at the end than at the beginning of a lease. The perception of this underlies all good and fair decisions. Cockle v. Parish, decided last November, and consequently not quoted by Mr. Fletcher, is a case in point which will, no doubt, come into another edition. One of the suggestions in the report was that the actual state of every part, on entering into occupation, should be put on record in the lease, much in the same way as in the *état des lieux*, stated to be customary in France. Such pieces of work, if done in a good, solid manner, would frequently be of much service to tenants and, of course, also to well-meaning landlords, anxious to get what they are fairly entitled to,—neither more nor less. The tendency of recent legislation and of recent decisions has happily been in the direction of protecting lessees from landlords who are anxious to get much more than they are equitably entitled to. Chapter X. is devoted to the Conveyancing and Law of Property Act, 1881, and some of the clauses are given in full in an appendix. By this Act a salutary restraint is put on piratical holders of property, who might be willing to bring discredit on the institution of private property by making use of powers with which they ought never to have been vested. Being decent people, a good majority would, for instance, always have scouted the idea of going for forfeiture in consequence of waste, except in the case of wilful

injury or gross neglect, without notice of the breaches of covenant had been served and a time allowed for the execution of the works. Everybody must now do the same. The law "applies to leases made either before or after the commencement of this Act, and shall have effect, notwithstanding any stipulation to the contrary." The other considerable addition is a chapter on the Agricultural Holdings (England) Act, 1883. A handsome, resolute index, of forty-two pages for a book of 105, would surely have softened the heart of Lord Campbell when disposed to be severe.

A History of Southampton, partly from the MS. of Dr. Speed. By the Rev. J. SILVESTER DAVIES, M.A., F.S.A. Southampton: Gilbert. London: Hamilton, Adams, & Co. 1883.

Those who know Southampton only as a seaport, brought out of obscurity by the development of steam navigation, may be surprised to learn that the town has a history full of interest, and not without importance. Southampton, too, is particularly rich in material relics of the past, and its Medieval walls and gates have to a large extent survived the neglect, violence, and vandalism to which they have for centuries been exposed. The fortifications upon the western side are for some 550 yards tolerably perfect, and four out of the seven principal gates still survive,—the Bar, or North Gate, and God's House Gate being even now structures of no common character, and the arcade work, commencing at Biddle's Gate, altogether unique in England. Ample justice has been done to these features of the town by Mr. Davies, and also by Mr. G. T. Clark, who contributed a paper on the subject to this journal in December, 1872. The extracts from the borough records trace the rise and decline of the town defences, and serve to establish the fact,—often overlooked in these days,—that bad building is peculiar to no age. In truth, to keep in order more than a mile of walls and towers was a sore burden for a community never remarkably opulent, and we can guess in what way the Corporation's order that repairs should be done "where there is necessity, in the most frugal manner," would be carried out. It is, however, remarkable that of the castle keep,—usually the last building to yield to decay,—not a fragment now remains. When Leland saw it in 1546 he called it the "glorie of the castelle . . . large, fair, and very strong," and at the very end of the same century it was in excellent condition. Yet in 1618 it was returned as ruinous, and, so far as can be gathered, no effort was made then or subsequently to arrest the progress of decay. The ecclesiastical edifices which belong to Southampton are numerous rather than important. St. Mary's is the principal church, and, tradition says, was built or rebuilt by Matilda, the wife of Henry I. Be that as it may, there is something sadder than tradition for Speed's assertion that in the middle of the sixteenth century it was pulled down because its lofty spire guided the French cruisers in their descents upon the town. The efforts to rebuild it seem to have been feeble and fiftal. In 1579 the sum of 68l. 17s. 4d. was expended on restoration, and it is, therefore, not surprising that fifty years later the chapel or reduced church was found to be "much in decay,"—a condition in which it was left until 1711. Then an energetic rector,—Archdeacon Brideonke,—took the matter in hand, and rebuilt the church after an honest, if homely, fashion at a cost of some 1,300l. But in 1833 a popular preacher undid the good work, and in its place reared an unsightly tabernacle, which, happily, was so badly built as to demand a speedy reconstruction. In 1871 the late Mr. G. E. Street advised its total demolition, and there is now rapidly approaching completion a really noble edifice, executed after that lamented architect's designs. Holy Rood Church, which is next in importance to St. Mary's, has met with fewer vicissitudes. It was removed to its present site as early as the year 1320, and seems to have undergone few structural changes until 1845, when it was rebuilt partly on the old walls and wholly on the original plan. The ancient oak stalls have been retained in the chancel, and the lectern,—an eagle trampling upon a dragon,—is a fine example of fifteenth-century work. Architecturally St. Michael's is the most interesting church fabric. It underwent considerable alterations in 1828 and again in 1872, but there is enough of the earlier structure left to show its original form and the

curious mode by which it was enlarged in the fifteenth century, when the cruciform church was converted into a parallelogram.

Of ancient domestic buildings several noteworthy examples are still to be seen in Southampton. A Norman house in Blue Anchor-lane is in tolerable preservation, and the so-called Palace of King Canute is an interesting relic of late twelfth-century work, and worth being rescued from the improver's hand, by which it is threatened.

In this case,—and, indeed, throughout the volume,—we greatly miss the pictorial illustrations which are almost essential to a book of this character. Mr. Davies has done his share of the work with such rare conscientiousness that he would not be satisfied with anything short of excellence in an artist colleague, and, of course, the services of such a one would have largely increased the cost of the History. But one would have thought that there was enough public spirit left in Southampton to provide funds for such a purpose, and enough talent fostered by the School of Art, in the Hartley Institute, to furnish one or more grateful and competent draughtsmen.

MEETINGS.

SATURDAY, JAN. 26.

Architectural Association.—Visit to the New Council Chamber, Guildhall, and new offices in Lime-street. Assemble in Guildhall at 5 p.m.

MONDAY, JAN. 28.

Surveyors' Institution.—Mr. T. M. Rickman on "Building Risks and their Incidence." 8 p.m.
Society of Arts.—Mr. Thomas Bolas, F.C.S., on a "New Development of the Woodbury-type Process" (Cantor Lecture). 8 p.m.

TUESDAY, JAN. 29.

Institution of Civil Engineers.—(1) Discussion on Mr. Hackney's paper on "The Adoption of Standard Forms of Test Pieces for Bars and Plates"; (2) Paper (time permitting) by Mr. F. R. Conder, M. Inst. C.E., on "Speed on Canals." 8 p.m.
Society of Arts (Foreign and Colonial Section).—Mr. Joseph G. Colmer on "Canada as it will appear to the British Association in 1884" (the Marquis of Lorne in the Chair). 8 p.m.

WEDNESDAY, JAN. 30.

Civil and Mechanical Engineers' Society.—Mr. Geo. C. Child on "Iron, from the Ore to Finish." 7 p.m.
Society of Arts.—Mr. Thomas Fletcher, F.C.S., on "Coal-gas as a Labour-saving Agent in Mechanical Trades" (Sir F. Abel in the Chair). 8 p.m.

THURSDAY, JAN. 31.

Parkes Museum of Hygiene.—Mr. H. A. Darbishire, F.R.I.B.A., "On Dwellings for Artisans." 8 p.m.
Society of Antiquaries.—Vice-Admiral Spratt, C.B., F.R.S., "On the Discovery of an Ancient Temple at the head of the Gulf of Doris." 8.30 p.m.
Society of Telegraph Engineers and Electricians.—Mr. Edward Bright "On a System of Electric Fine Adjustment." 8 p.m.
Society for the Encouragement of the Fine Arts.—Mr. Brinley Richards on "Ancient and Modern Music." 8 p.m.

FRIDAY, FEB. 1.

University College.—Professor C. T. Newton, C.B., on "Lycian Rock Tombs." 4 p.m.
Institution of Civil Engineers (Students' Meeting). Mr. Edgar Smart on "Some Elementary Electrical Notes." 7 p.m.

SATURDAY, FEB. 2.

Association of Public Sanitary Inspectors (2, Adam-street, Adelphi).—Mr. F. T. Poulson on "Procedures in Dealing with Nuisances." 6 p.m.

Miscellaneous.

Birmingham Architectural Association.—The third ordinary meeting of this Association was held at Queen's College on Tuesday, January 15th, under the presidency of Mr. W. H. Kendrick. The following gentlemen have been elected as new members:—Messrs. D. Arkell, J. Cotton, W. Read, B. McEvoy, A. H. Knott, and H. Beek, and two others have been nominated for membership. A paper was read by Mr. Victor Scruton on "Life, Death, and Futurity in Architecture," followed by a discussion and a hearty vote of thanks, in which the following members joined:—Messrs. J. Cotton, H. H. McConnal, F. G. Hughes, T. W. F. Newton, and the Hon. Sec., Mr. Franklin Cross.

Fungus in a Library.—Under this heading Mr. Delevingne writes to *Notes and Queries* as follows:—A singular instance of the havoc among books which may be made by the growth of fungus was brought to my notice recently. An outer pipe becoming choked, the water it should have conveyed ran down the wall outside. The leakage was not discovered till the woodwork and shutters of an adjacent window began to crack and start, being forced out by the growth of an enormous fungus between them and the wall. When the presses and books near the wall were examined, the former were found to be strained and loosened, the latter covered with a coating of brownish fungus, three to four inches thick, which fastened them to other books so attacked and to the shelves of the bookcases. On trying to open the books, most of the leaves were found so firmly glued together by a white, silky, sporadic formation, in shape somewhat like seaweed, that attempts to separate the leaves without tearing them were futile. Hundreds of pairs of leaves, in books two or three feet from the wall, were thus penetrated; and, thin as was the coating of fungus, it almost obscured the letterpress, and, of course, ruined the plates. The most effectual way to repair the damage appeared to be to thoroughly clean the fungus from the exterior, and expose the books to a gentle heat till the damp was expelled. Though the books could then be opened and read, many were irretrievably injured. The rapidity of growth of this fungus was remarkable. For the sake of experiment, *in corpore viti*, a book after being treated as above, was replaced. In three days the exterior had acquired a coat of fungus about an inch thick; the book was fixed on the shelf, and the leaves refused to be parted asunder. Moral.—See that water-pipes near a library are not choked.

The Strand Buildings Company.—The twenty-sixth annual report of the executive committee of this company, which was established for the erection of improved dwellings for the working classes in Eagle-court, Strand, has just been issued. In it the committee give a short résumé of the transactions of the company since its formation. The company was formed under the Labourers' Dwellings Act of 1855, and it is believed that this company was the only one registered under the Act in question. The buildings consist of thirty-eight sets of rooms (two in each set) which have been continuously occupied for the last twenty-five years. The loss by arrears of rent has been so small as to scarcely call for notice. At the end of the financial year just completed the total amount in arrear was only 13s. The rents charged for each set of two rooms are 5s., 5s. 6d., and 6s., per week respectively, according to the position of the rooms. There is a laundry provided for the use of the tenants. Water is laid on to each landing, and a dust-shoot, communicating with the yard, is fixed on each floor. There is, unfortunately, a great and constant outlay entailed for repairs and maintenance of the buildings, in consequence of most of the rooms being occupied by large families. Such occupation, of course, involves constant wear and tear, and the committee fear that there is no probability of this expense decreasing. The dividend for the last fourteen years has been steadily maintained at 5 per cent. per annum, and the directors again recommend a dividend at this rate for the financial year ending the 31st of December, 1883. Nothing is said in the report as to the total number of people housed, nor of the rate of mortality amongst the occupants.

Photo-Mechanical Printing Processes. On Monday, the 28th inst., Mr. Thomas Bolas will deliver, at the Society of Arts, the first of a Course of Cantor Lectures on "Recent Improvements in Photo-Mechanical Printing Processes," in which he will deal with new developments of the Woodbury Type process. The second lecture, on February 4th, will be on type blocks from line drawings and half-tone subjects; and the third and concluding one, on February 11th, will be devoted to the consideration of intaglio plates, collotypes, photo-mechanical methods as applied in the decoration of pottery, and miscellaneous processes.

Mr. George Stephenson, of Hampstead, writes to say he is not the G. Stephenson who is lowest in the list of tenders for drainage at South Eltham, concerning which he has had several applications.

How to Deal with the Dwellings of the Poor.—The *Sanitary Record* suggests that every house let in lodgings or occupied by the poor should be regularly visited twice a year by an inspector, and more often on complaint being made, and notices should be served and enforced as regards the removal of all nuisances or defects found on the premises. The owners of these houses should be served with notices under the 35th section of the Sanitary Act, to do all that was necessary for cleansing and repairing the premises. The regulations made under this section should be uniform for the whole of London, instead of being, as at present, different in several parishes or districts which have made them. If the owner neglected to comply with the notices by a given day, he should be subject to a penalty of, say, not less than 5s. per day during which default was made. The name and address of the legal owner, *i.e.* the person receiving the rent—as well as of the actual owner, should be sent, under a penalty, to the office of the local authority for registration, so that there should not be any difficulty as to the service of notices. If, after having been summoned for the penalties, the owner still made default, the local authority should have power to close the room, or the whole house, if necessary, after having had a second notice served upon him of their intention to do so. An order of the magistrate to do structural works might be appealed against, but the house should be shut up during the appeal. No appeal should be allowed either as to penalties or the carrying out of ordinary sanitary work, such as the amendment or cleansing of drains, cleansing and ordinary repair of premises, providing an improved water supply to closets, or a separate supply for domestic purposes distinct from that for the closet. The power of appeal which already exists to the Metropolitan Board of Works as regards works done under the Metropolitan Local Management Act might still remain, as that refers, amongst other things, to the mode of and the materials used for the drainage of houses.

The Metropolitan Board of Works' vacant site in Cartwright-street, Royal Mint-street (the sale of which on the 10th inst., by auction, was alluded to in last week's *Builder*) was purchased by Messrs. Davis & Emanuel, architects, 2, Finsbury-circus, on behalf of a syndicate formed to erect dwellings for the lowest class of the poor in the East-end of London. The Rev. S. A. Barnett, vicar of St. Jude's, Whitechapel, Mr. Bond (a member of the London School Board), Mr. Crowder (who has already built for private investment a block of dwellings in George-yard, Spitalfields, and elsewhere), and other gentlemen interested in this social problem form the syndicate, and the East-end Dwellings Company will be established by them, with Messrs. Shaen & Roscoe as solicitors, and Messrs. Davis & Emanuel as architects. The dwellings to be erected in Cartwright-street will have a frontage of about 370 feet, and are intended to be of an experimental character; and the promoters hope that it will be possible to provide rooms at rents which can be afforded by the poorest classes, and yet to yield a return of 5 per cent. upon the investment. Should the result of the experiment be in accordance with the hopes of the promoters, which may be confidently expected, the Cartwright-street site will be the forerunner of many other dwellings which will be erected by the East-end Dwellings' Company.

The Surveyors' Institution.—Upwards of 100 candidates have entered their names for this year's examinations,—54 for the preliminary examination held during the present week, and 50 for the professional examinations in April. The latter number comprises 40 candidates in the Land Agency, Valuing, and Building-Surveying sections of the Associates' examination, and 10 in these sections of the Fellowship examination. Many of the candidates are past or present students at the Agricultural Colleges, the City of London College, and other places of technical and scientific education. The Institution now numbers upwards of 1,000 members, of whom nearly 500 have been elected since the incorporation of the Institution by Royal Charter two years ago. Of this number, 580 hold the Fellows' diploma, and 263 the diploma of Professional Associate.

The Hospital for Epilepsy and Paralysis, Regent's Park, is being re-drained, under the superintendence of Mr. Ernest Turner. Messrs. Scrivener & Son are the contractors.

Sanitary Condition of Cambridge.—It is like perusing ancient history to read that, in consequence of the numerous complaints made by inhabitants of Cambridge as to the neglect of the sanitary condition of the town by the Commissioners, the Local Government Board is about to hold an inquiry. In 1874 there was a similar outcry, and then great things were to be done, among which the diversion of the sewage from the Cam was considered a matter of immediate necessity, and schemes were prepared showing the ease with which it might be effected. However, for some reason or other, the Local Government Board failed to press its demands, and since then sanitary matters have remained much *in statu quo*. Whoever has visited Cambridge must be fully aware how urgently an adequate scheme of drainage is required. Owing to the level on which it is built, the flow through the main sewers is sluggish, whilst those constructed when the town was much smaller are now overcharged with the drainage from numerous new suburbs, to say nothing of their state of decay and disrepair. Were it not that Cambridge is exceptionally fortunate in having secured an excellent water-supply, and being provided with many open spaces, which secure an ample diffusion of the sewer gases into the general atmosphere, instead of penning them up, the ill effects of the present drainage system would ere this have been felt more severely.—*The Lancet*.

Meteorology.—The sixth of a course of lectures on "Meteorology," by Mr. W. Marriott, F.R.Met.Soc., was delivered on the evening of January 17th, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Perry F. Nurse, member of council, in the chair. The lecture was devoted to the subject of rainfall. After explaining that rain was produced by the cooling of air more or less charged with moisture below the temperature of the dew-point, the lecturer described the various forms of gauges used for measuring the quantity of rain that fell. As rainfall decreases with height above the ground, it was shown that in order to obtain accurate and uniform results all gauges should be placed in open situations with their funnels 1 ft. above the ground. Owing to the labours of Mr. G. J. Symons, our knowledge of the rainfall of the British Isles has been greatly extended during the past twenty years. The greatest annual rainfall occurs in the west, and the amount gradually diminishes towards the east. The greatest rainfall occurs in the lake district, where several stations have an annual rainfall of 100 in. The average rainfall for London is 24.5 in., October being the wettest, and February the driest month. After giving instances of heavy falls, and pointing out the necessity of a knowledge of the rainfall of a district in order to provide for the water supply of towns, the lecturer concluded by showing the distribution of rainfall over the globe.

Hipswell Vicarage Competition.—The trustees charged with the erection of the new vicarage at Hipswell, near Caterick, have examined the sketches sent in by four local architects, to whom invitations had been issued. The plans submitted by Messrs. Clark & Moscrop, of Darlington, were selected.

TENDERS.

For additions to Hastings Lodge, for the Hydro-paths and Spa Company. Messrs. Jeffrey & Skiller, architects, Hastings:—

Womersley.....	£4,750 0 0
Gates.....	4,665 0 0
Smith.....	4,850 0 0
Oakley.....	4,650 0 0
Stubbsfield.....	3,393 0 0
Phillips Bros.....	4,390 0 0
Harnam.....	4,300 0 0
Rodda.....	4,200 0 0
Howell.....	4,158 7 9
Peters.....	4,075 0 0
Bell.....	3,983 0 0
Fried.....	3,981 0 0
Bridgland.....	3,827 0 0
Hughes (accepted).....	3,800 0 0
White.....	3,560 0 0
Vidler.....	3,720 0 0
Ditch.....	3,640 0 0
Small.....	3,577 0 0

For the erection of a villa-residence at Coombe, Dartmouth, for Mr. Charles Russell, Mr. E. R. Back, architect, Dartmouth. Quantities supplied by the architect:—

Rundell, Kingsbridge.....	£239 0 0
Winer, Dartmouth.....	605 0 0
Williams, Dartmouth.....	560 0 0
Fellow, Dartmouth.....	544 0 0
Henley & Grant, Dartmouth (accepted).....	625 0 0

[Architect's estimate, 531*l*.]

For enclosing the promenade, and painting the external work, of the pavilion approach and entrance buildings of the Clarence Esplanade Pier, Southampton, for the Clarence Esplanade Pier Company, Limited. Messrs. Davis & Emanuel, architects. Quantities supplied by Mr. H. F. Foster:—

Hill & Co.	£3,257 0 0
Bramwell Bros.	1,987 0 0
G. Burbridge	1,973 0 0
W. H. & C. Light	1,945 0 0
T. C. Cooper	1,788 0 0
W. Ward	1,763 0 0

For a quantity of ironwork in columns, girders, and joists, for the Salvation Army "barracks," Burne-street, Marylebone, for "General" Booth. Mr. E. J. Sherwood, architect, 101, Queen Victoria-street:—

	Cast Iron.	Columns,	and	Long	Girders
	per ton.	per ton.			
Measures Bros.	£8 10 0	£9 10 0		£5 17 8	

C. Williams & Co., Westminster 7 5 0 ... 7 5 0 ... 6 5 0

T. Shaw & Co., London 6 15 0 ... 10 0 0 ... 6 5 0

Oswald, Gardner, & Co., Lambeth 7 10 0 ... 7 10 0 ... 6 5 0

For the erection of a house and offices in the Kendrick Road, Reading, for Miss Player. Mr. W. Ravenscroft, 6, Market-place, Reading, architect:—

Margrett, Reading (accepted) £1,824 6 0

For the erection of a house at Goring, Oxon, for Mr. W. B. Hallett. Mr. W. Ravenscroft, Reading, architect:—

Higgs, Goring (accepted) £833 0 0

For the erection of Town and County Club Buildings, Bedford. Mr. Henry A. Cheers, architect. Quantities by the architect:—

Smith, Bedford	£3,772 0 0
Everett, Colchester	3,769 0 0
Walton, Bedford	3,768 0 0
Laughton, Bedford	3,636 0 0
Satch, Cambridge	3,591 0 0
Wilnot & Son, Basingstoke	3,580 0 0
Harrison, Bedford	3,540 0 0
Woods, Weybridge	3,496 0 0
Dover, Oxford	3,490 0 0
Miskin, St. Albans	3,487 0 0
Hull, Bedford	3,450 0 0
Haynes, Bedford	3,401 0 0
Hull, Cambridge	3,415 0 0
Foster, Bedford	3,376 0 0
Underwood, Wellingborough	3,398 0 0
Foster, Rugby	3,333 0 0
Botterill, Luton	3,365 0 0
Wilkins, Maidstone	3,388 0 0
Ireton, Northampton (accepted)	3,000 0 0

For the extension of iron roof, Spitalfields Market.

Mr. H. Lovegrove, architect:—	
Newton, Chambers, & Co.	£2,468 0 0
Lee Side Ironworks	2,305 0 0
Russell & Robertson	2,291 0 0
Horsley Company	2,050 0 0
Dawson & Nunmley	2,050 0 0
W. Jones	1,960 0 0
Coalbrookdale Company	1,941 0 0
Whitford & Co.	1,900 0 0
Oswald Gardner	1,883 0 0
M. T. Shaw	1,848 0 0
Goddard & Massey	1,827 0 0
E. O. & J. Keay (accepted)	1,750 0 0

For taking down and removing two iron buildings in Kenmore-road, Chelsea, and re-erecting them in Ackmar-road, Chelsea, for the School Board for London. Mr. E. R. Robson, architect:—

Atherton & Lettis	£485 0 0
C. Wall	475 0 0
W. Oldroyd	470 0 0

* Recommended for acceptance.

For alterations and additions at the Shoreditch Branch of the London and County Bank. Mr. Fred Chancellor, architect, 8, Finsbury-circus, and Chelmsford. Quantities supplied by Messrs. Curtis & Sons:—

Brown & Co.	£5,050 0 0
Kiddle & Sons	2,970 0 0
Boyce	4,783 0 0
Cox	4,700 0 0
Ferry & Co.	4,549 0 0
Rider & Son	4,468 0 0
Mortimer	4,421 0 0
Fritchard	4,384 0 0
Higgs & Hill	4,294 0 0

For the erection of a school for 800 children on a site in Ruby-street, Peckham (Lambeth Division), for the School Board for London. Mr. E. R. Robson, architect:—

Turtle and Appleton	£10,785 0 0
G. S. S. Williams & Son	10,277 0 0
W. Johnson	10,149 0 0
Lothry Bros.	9,874 0 0
W. Bangs & Co.	9,719 0 0
Perry & Co.	9,630 0 0
W. Shepherd	9,610 0 0
Atherton & Lettis	9,463 0 0
J. Marsland	9,337 0 0
Loneragan Bros.	9,300 0 0
W. Oldroyd	9,277 0 0
W. Brass	9,174 0 0
Patman & Fotheringham	9,153 0 0
C. Wall	9,107 0 0
Wall Bros.	9,097 0 0
H. Hart	9,082 0 0
Kirk & Randall	9,011 0 0
Stimpson & Co.	9,008 0 0
J. Smith & Sons	8,993 0 0
S. J. Jerrard	8,969 0 0

* Recommended by the Works Committee for acceptance.

For school keeper's house at the school in Crampton-street, Newington (Lambeth Division), for the School Board for London. Mr. E. R. Robson, architect:—

Kirk & Randall	£293 0 0
S. J. Jerrard	733 0 0
D. S. Rice	697 0 0

* Recommended for acceptance.

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F. G. S. (thanks).—Messrs. F. G. S. H.—B. F. (cannot return to the subject).—M. S. B. (ditto).—F. Y.—G. C. E. (ditto).—T. R. H. (send name and address).—A. M. P. (next week).—Lester Society of Architects (next week).—Messrs. D. C. and W. (next week).—A. G. D.—Capt. R. (see "Standing Orders" below).

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Loftie's History of London.*

HE closing years of this century already establish their claim to be justly regarded as an age of biography and history. Amongst the compilations to which such a character is due may be ranked two or three works which came out during the past twelvemonth; for the essence of their history lies in their account of the lives and manners of men. We recently reviewed one of these; that of the Rev. J. Cave-Brown upon "Lambeth Palace and its Associations."† Another is Major Griffiths's "Chronicles of Newgate"; and another forms a notable contribution to a study which, for some forty years or more, has been almost neglected, since the new Topographical Society scarcely realises its founders' expectations. Of the ordinary hand-book or guide to London we assuredly have no lack. But relinquishing the seductive patina of personal anecdote and local gossip, Mr. Loftie enters upon a wider, albeit more difficult, field. He chooses for theme the making of London,—erroneously styled the capital,—when viewed as a centre of civic liberties and municipal administration. So great a subject cannot, of course, be exhausted in the two volumes before us. Where much is attempted not a little must remain unaccomplished. Yet let this be no disparage to a masterly performance that has been undertaken alone, to researches prosecuted amongst records hitherto neglected or unknown. Moreover, the pending crisis in municipal affairs gives to Mr. Loftie's inquiries an exceptional interest which otherwise they might fail to arouse, and we can only hope that his undoubted success will induce him to treat as they deserve many topics,—as, for instance, conveyance, lighting, and commerce,—which he here but briefly discusses.

What, then, is London, and how came it where it is? To this opening and all-important question no better answer can be supplied than by reading as if they were a book,—and a book indeed they are to all who shall inspect them aright,—some of the excellent maps made for this work. Disregarding the fables, beloved by Leland, of Gildas and

Geoffrey about Brutus and Troynovant, Kings Belin and Lud, we must thoroughly familiarise ourselves with the conception of an extensive lagoon, situated on this wise. Interspersed with marshes and dotted with islets, it lies eastwards and southwards of a peninsula which is washed by the waters that now flow in a more or less artificial channel between Richmond and Gravesend. Through the marsh-land run the Brent, Hammersmith Creek, Eelbrook, and Counter's Creek, the West and Aye-bourne, the Fleet and Wall-brook, the many loops and branches of the Lea. From the nearer Surrey and Kentish Hills flow Beverley-brook, the Wandle, Falcon-brook, the Effra, the Raven's-bourne and its tributaries. For the name of one of these our author, we may observe, rejects the common derivation. "The Fleet," he says, "did not love [as did the Aye-bourne] to wander through open meadows, or go miles out of its way to avoid a hill. On the contrary, it seemed, wherever it came, to have made its mark as deep and indelible as it could, and its early name of Hole-bourne is easily explained when we find it running between banks so steep that in places they may be called cliffs." The little Wall-brook, having its source in the fens beyond Moor-fields, ran towards the end of its course between two hills, then less than 50 ft. above the water level, whereof the western was skirted by the Fleet, so long the bulwark of London on that side. With respect to the other hill, on the stream's left bank,—the hill that is undoubtedly the *omphalos* of the whole position,—Mr. Loftie says little or nothing to connect it with the supposed settlement there of the Trinobantes, or with more probability, of Kaswallon. He concedes, it is true, that here, if anywhere, there may have been an early British fort, and "here, long before the coming of the Romans, the old Celtic chieftain of the district may have placed his fortified cattle pen." Nevertheless, to this spot, long since buried "full fathom five," whether it be the Keltic Llyn-din (stronghold by the lake), or the Belgic Lun-den (fastness by the grove)—Claudius leads his legions.* Hither drawn by what Tacitus calls the *loci dulcedo* soon collected that large population whom Suetonius left to their fate at Boadicea's hands, inasmuch as the settlement had but slight military value. But in course of time arose Augusta, the favoured and honoured city, extending

* Countless difficulties beset this question. Caesar's *civitas Trinobantum* may be London; it may be St. Alban's. By the *firmissima civitas* of that tribe Norden understands this settlement. The piles discovered (1807) in London Wall and Southwark-street are held by General Pitt Rivers to indicate lacustrine dwellings here of a pre-Roman era. Dr. Guest and the late Rev. J. R. Green oppose the British town theory, whereas Mr. Kemble and Mr. T. Lewin, with others, uphold it. The river's mouth was much nearer to London than it is at present.

over the western hill to the high bluff by the Fleet. Around this, though not until within sixty years before their final withdrawal under Honorius (A.D. 410) to meet an enemy who threatened them nearer home, the Romans built the later and outer wall. This wall, could it be reproduced, would be found to enclose the 380 acres which, together with the Farringdon Without, Portoken, and Bishopsgate Without Wards coincide with the City of to-day. We must refrain from following the author's highly-interesting disquisition upon the ancient roads that converged towards the City,—one from Chester to the broad shallows lying between Millbank and Stanegate, and so (following the Milky Way) on to Dover; another, branching from the Watling-street by the Marble Arch, trending to the ferry across the narrow but deep channel over against St. Mary Overey's. We hasten forward to what he terms one of the most awful episodes in our history, the repulse of the unprotected Britons by the heathen victors at Crayford. "We see the city surrounded by the invaders, and the hapless fugitives from the slaughter in the valley of the Cray crowding the gates. . . . Augusta has made her very last appearance on the stage of history. What went on within the Roman walls after that fatal year, 457, we know not. There is silence everywhere, and it lasts for a century and a half. . . . 'No territory,' remarks a great foreign historian [Lappenberg] 'ever passed so obscurely into the possession of an enemy as the north bank of the Thames.'" Barely has the seventh century begun and we find the Saxons in assured occupation. Persuaded by his wife Bertha, a king of Kent dedicates to St. Paul a Christian church on the summit of the western hill, with Mellitus, sent with Justus, bishop of Rochester, by Gregory to St. Augustine, as its first bishop. In what Bede already calls their "metropolis" Æthelberht establishes as king of the East Saxons his nephew, Sæghberht, to whom in turn is ascribed the great western Minster, which arose from amidst the brambles and thickets of Thorn-ey, *locus terribilis* (the venerable or awful, rather than terrible, spot) of Offa's earliest charter. Converted by St. Augustine's followers, the people relapse, during a dreadful plague, to Woden and Thor. They are reclaimed to the faith by the Saints Osyth and Æthelburgha,* together with him who gives his name to four churches at the gates,—Botolph, special saint of Eastern Anglia. Henceforward London ceases to be the capital of one Saxon kingdom. It is eagerly coveted

* St. Æthelburgha is yet a London parish, and Saint Osyth survives in that of St. Benet Sherehog, Sise corruption of St. Osyth's) lane.

* "A History of London." By W. J. Loftie, B.A., F.S.A., author of "Round about London," "In and Out of London," &c. With Maps and Illustrations. In two volumes. London: Edward Stanford, 1894. [Second Edition.]
† See the *Builder*, vol. xlv, p. 165 (February 17th, 1893).

by that king of whichever kingdom is paramount in all England. Higher as to their own city retire the Danes after the truce they forced from Ælfred. The story of his contest for its possession is the story of his life. In the end the Londoners hold their own: they increase in numbers as in wealth. "At a later date there are many references to this good time of old, and the number of foreigners in London when the Conqueror came shows that the concourse of merchants still existed in spite of the Danes. During the century and a half which elapsed between the death of Ælfred and the peaceful time of King Edward, London Wick and London Hithe, and London Street were crowded whenever London Bridge [dating with certainty from Eadgar] was open."

The Conquest completed the change in London as England's capital which had begun with the removal of St. Eadward to Westminster. Although our sovereigns down to the Stewart dynasty, when they had business in London, or when for that matter the Londoners had business with them, occupied the Tower, they made no permanent residence within the City. But from William's day she enters on a fresh life, commerce becomes her new source of greatness. With the Norman's charter to William, bishop, and Gosfreht, portreeve, and all the burghers within London, French and English, friendly, begins a long tale of documents like thereto, which step by step recovered from the Crown a quiet enjoyment of the true ancient liberty that has been the Teutonic ideal for so many centuries. The conqueror of England's grant to the citizens was confirmatory, nay, conciliatory in tone. As "law-worthy" they were to enjoy freemen's privileges in courts of justice; inconsistently with feudalism, or tenancy in demesne, they are to inherit the property of their fathers. His son Henry goes further; his grants are twofold, being in the nature of remissions and gifts. Thus Mr. Lottie leads the way to his chapters upon the struggle for liberty, the rise of the companies, the wards, and the companies themselves. Nor do we think we wrongly surmise that, setting aside awhile its more purely local or topographical annals, it is by this part of his labours that our author would have his merits estimated and appraised. In saying that "the London election of Stephen shows plainly the increasing influence of the citizens in public affairs," he sounds the ground-tone of his story. Stanch to the monarch of their choice, we have to consider the Londoners in their attitude towards the Angevin kings. Under Henry Fitz-Aylwin, their first mayor, we find them chosen objects of the Lion-hearted's politic designs; they obtain the condemnation of that Bishop of Ely, Longchamp, who would have strengthened the Tower, which Mr. Lottie aptly styles the padlock of the chain of defence, to their harm. The siege and capture in St. Mary-le-Bow Church of Fitz-Osbert, William of the Longbeard, gained him over 50,000 adherents. Richard defines their rights in the matter of the Conservancy of the Thames; and at Runnymede they secure a special clause in the Great Charter. King Henry III. triumphed for a short period in making grants in Middlesex to the abbot of the Minster, whose rebuilding he had in hand.* But he soon had to cope on this question, as on others, with Thomas Fitz-Thomas, choice of the "plebeian" citizens, and appositely designated the Simon de Montford of London. He it was who had courage to tell his sovereign that so long as he would be a good lord and king, they would be faithful and dutiful to him; legalising the existence of the novel trade guilds, he overthrew the old oligarchy of the churls, who, in Henry III.'s words, called themselves barons. "When the craft guilds became powerful enough to control the election of the City officers, the old system was about to die. Its work was done, but it died hard. By the end of the fourteenth century it was gone."

In tracing the rise of the City companies it

is needful to bear in mind how some long established families of the aristocratic side once reigned supreme in certain districts, giving original names to the wards into which those districts developed. Thus in Bassishaw and Castle Baynard were settled the patrician Basings and Hadstocks; the Farringdons in the two now wards of that title; the Becketts, from Rouen, and the Bukerels, from Italy, on the northern and southern sides of Chepe; the Frowyks in Chepe itself; the Coyvntres in Vintry; the De Blakethornes in Aldersgate; the Pountneys on the eastern hill site of the ancient Roman fort. To these properties under aldermen, who at first were the heads of their respective families, were subsequently added, but by no means easily, certain Sokes or Liberties,—such as Cornhill, a former soke of the bishop, and Portoken appertaining to the Nighthen guild without Aldgate. These powerful houses opposed strenuous obstruction from within, but at length succumbed, and finally disappeared altogether before the progressive march of the bonded craftsmen. The earliest guilds were different in kind, some being religious, some social; the most important were mercantile. Having head-quarters in the "town guild" at the Guildhall, they directed or strove to direct the whole policy of the City. To Walter Hervey, succeeding Fitz-Thomas as champion of popular rights, is due the later united resistance of the handicraftsmen to the oligarchical action of the town guild. Our author demonstrates how it was he "who, more than any one else, prepared the way for the Whittingtons, the Larges, the Greshams, the Beckfords of later generations, and who set the ancient liberties of London on a foundation so secure that they remain practically what they were after the lapse of half a millennium." He fairly complains of the oblivion in which is left the memory of one who, first to recognise the importance of the handicrafts, substituted companies for guilds, and made them future rulers of the municipal commonwealth. Since we know of Hervey as granting numerous enfranchisements which were afterwards impounded and declared illegal, we should not forget that it was by Royal charters, commencing even with that of Henry I. to the Weavers, that the traders acquired exclusiveness and monopoly for the exercise of their respective crafts and mysteries.* Before his death, 1377, King Edward III., himself member of the Linen-armourers (not necessarily armour-makers, though now combined with the Braziers), had granted charters to eight of the twelve principal City guilds. "The companies included in every case the greater merchants. The most eminent members of the City governing body,—the aldermen,—joined them, and in a very few years they were able not only to control trade, but also to control the corporation."

It were manifestly impossible to more than very rapidly pursue on the lines of this volume the citizens' fortunes during the golden prime of the three Lancastrian kings. One of the last public acts of the last Plantagenet sovereign was to make Whittington mayor on Adam Bammes's death in his year of office. The career of the mercer apprentice, so vividly recounted by Mr. Besant and his late coadjutor, Mr. Rice, is one of the most fascinating in civic annals. Yet it possesses a deeper significance in evincing how it had become possible for one who owed little to his antecedents, and nothing to the favour of the great, to raise himself, as has been repeatedly done since, to the highest place in popular esteem within the City. To this day certain endowments testify to the public munificence of him who magnanimously cancelled his sovereign's debt; many leading members of the existing peerage trace the foundation of their houses to fellow-citizens of Richard Whittington. The share taken by Londoners in the contests for the crown culmi-

* We may here point out that the word "mestera" or "mestier" (compare the French, *métier*; Italian, *mestiere*; Provençal, *mestrier* and *mestier*; Spanish and Portuguese, *mester*) is a corruption of the Latin *ministerium*, "a serving to," and not of *mysterium* "a secret." The oldest mystery is that of the Saddlers, but precedence has always been yielded to the Mercers, the *homines de Merceria Civitatis Mercere Londoni*. The charter of the Carpenters, the Confraternity of Surveyors and Builders,—one of the first to own a Hall of their own,—bears date July 7, 1377. Company is purely a modern term.

nated in their bestowing it upon King Edward IV. The very day on which Stockton, mayor, the sheriffs and aldermen, amongst them the famous John Crosby, with a great multitude, met him at Islington, there died in the oratory of the Wakefield Tower the ill-fated monarch whom the citizens had helped to defeat at Barnet, and who some fifty years before had been carried in his mother's arms to kneel amongst them, for the first time, by the altar before Erkenwald's shrine at St. Paul's. Those who would read of the London cœval with him that, above all others, gives us immortal pictures of the many-sided events and scenes which have passed in its limits may turn with profit to the chapter entitled "Shakspeare's London," a subject fraught with interest to the student, whether he be historian, antiquary, or architect. The after chronicles of the civil war, the plague, and the fire form prelude to a few observations upon the labours and genius of one man, who, had he been left alone, would have done so much more, but who did so much to beautify and reconstruct London as known to later generations.

The second volume deals mainly with the suburbs. By that term we are to understand so much of what, for want of a more accurate description, we must call the metropolitan area as lies beyond the City strictly so called. This division, whilst not at first clearly obvious, and offering temptation to somewhat discursive writing, is so far convenient for Mr. Lottie's purpose. Besides it has the additional advantage of separating the more valuable portion of his work from a good deal which, by the nature of the case, has been told before. Under these circumstances we may be pardoned for not dwelling thereon at any length. At the same time we would particularly notice what he says concerning the manors of Holborn and Noyte, the Berkeley, Grosvenor, and Tyssen estates, with the manors of Lylleston and Islington. These, with kindred topographical details, remind us of the maps and drawings prepared by Mr. Stanford, and which so largely enhance the interest of the letterpress. Some of them reproduce originals that are familiar to frequenters of our national collections, but are little known to the ordinary reader. One or two are from J. Rocque's work (1763); another, of the Marylebone estate as bought by the Duke of Newcastle in the year 1708, is from private sources; another graphically shows the booths and standing marts as they probably clustered around Chepe six or seven hundred centuries ago. Striking too are those illustrating Stepney Manor, the gradual growth of London, the channels of the northern streams, the Benedictine Abbey at Westminster, and London of the thirteenth century.* That of the Minster is very good, being due to the researches of Mr. J. H. Middleton, F.S.A., and Mr. Micklethwaite. There should be noticed the Abbey Mill (over a tributary of the Aye-bourne), the Calberge and Guest Hall, in Dean's-yard; the infirmary chapel, east of the little cloisters; the prison, now the school entrance; and the Misericorde, over which, stands Ashburnham House, but of which, together with the Privy Dorter or Necessarium, many traces were revealed last winter at the demolition of the late Dr. Turle's Tudor house.† The map of the northern water-courses is so important that we wish it were done to a larger scale; and included the streams westwards of the West-bourne. As it is, some vanished localities might have been marked, such as Kilburn Wells, the Nine Acres where the West-bourne crossed the Harrow-road at the green, Coalbrook-dale in Bayswater-road, the Neat Houses, and Five Fields at the King's Scholars' Pond. One source of the Aye at Hampstead might have been denoted as Shepherd's Well (now we believe in the garden of Conduit House, Fitzjohn-avenue); neither Avery-row nor Cowford by the Stone bridge at Brook-shott is shown; and we think this stream should appear as passing before, not beneath, Buckingham Palace. So similarly

* In this plan we observe a slight inaccuracy. The church at the south-western corner of Threadneedle-street should be marked St. Benet Fink, and not St. Martin Outwich, which latter also appears in its proper place. † See the *Builder*, vol. xli., p. 33 (January 14, 1883), and vol. xlv., p. 225 (Feb. 17, 1883).

* At the end of the eleventh century the greater part of the county,—the king having no single manor therein,—was in the hands of the Church.

with the Fleet. The West-bourne, in fact, formed the western boundary of the Bishop of London's Paddington estate, and of St. George's parish; the Aye-bourne that of the City and Liberties of Westminster, which by Eadgar's charter of A.D. 951 originally lay between this stream on the west, Oxford-street and Holborn (Stratford-place to Farringdon-street) on the north, the Fleet along Farringdon and Bridge streets on the east, and the Thames (Blackfriars Bridge to Aylesford-street, Pimlico) on the south. We may conclude in expressing our cordial concurrence with Mr. Loftie's strictures upon the ill-advised changes that have been made throughout London, and particularly of late years at the Tower; seeing what has been done in the latter quarter, and hearing what it is yet proposed to do,* we tremble with apprehension for the so-called restoration between the Salt and Wakefield Towers along the inner ward.

The weak part of Mr. Loftie's work is where he goes into architectural criticism on his own account. Here he seems to have no rule or guide except a general belief in the impeccability of Wren, and in the beauty and fitness of what he speaks of as the "so-called Queen Anne style." The Kensington Vestry-hall is a failure, the Vestry "having unfortunately refused a Queen Anne design." The statements may both be true, but their logical relation may be questioned. Like other writers, Mr. Loftie can point out the unsuitability of the Greek imitations in St. Pancras, or the unpractical character of the high shallow Ionic portico at the British Museum, which shelters no one; this is all easy enough now that Mr. Fergusson and some other writers have shown the way. A critic who cannot see anything in Somerset House, and thinks the Adelphi front (because, we presume, it belongs to the sacred period) much superior, is hardly worth serious consideration in regard to this part of the subject. We are glad to observe that one absurd mistake, whereby Wilkins was credited with the design of the great building of the Classic revival, St. George's Hall at Liverpool (Mr. Loftie having apparently never heard of Elmes), has been corrected in the second edition. But Mr. Loftie has no "dry light" on London architecture to give his readers; only the special prejudices of the set of opinions which he and a certain circle of architects and dilettanti have adopted; and where he is right in his architectural judgments, it seems rather by accident than in the following out of any logical principle of architectural thought or criticism.

THE CONTEST BETWEEN THE LABOURER AND THE STEAM-ENGINE.

THE services rendered to civilisation by the steam-engine, in the first century of its existence, are so important and so manifest, that it is very likely that many of us who regard the extension of steam-power to every department of industry as a mere question of time should forget that there is, after all, another side of the question. To a very large class, moreover, that other side is the most obvious, and the most objectionable. The means of expressing their views as to their own interests are less available to this class of persons than to those who, enjoying to the full the benefits secured by the use of heat as a motive power, are disposed to overlook the constantly-recurring friction between the remains of the former régime, and the progress of change.

In no department of industry has the conflict between human and mechanical motor power been more pronounced than in the operations of the builder. Yet how many among the rising generation of architects can remember the conditions of a strife which was carried on by a numerous series of strikes? A man must number more years than he is anxious to count who remembers very distinctly the long lines of Irish labourers that were seen crawling up a long series of ladders, each man laden with his hod, where any great building was in progress. The substitution of

a steam-winch for this rude form of human toil was one of the most obvious improvements at the disposal of the builder. It promised at once to effect a considerable economy in the cost of local transport, and to relieve the workman from a very hard, and not a little dangerous, toil. But how studiously was the innovation resisted by the vested interest of the hod-men! It is doubtful how long their opposition might have prevailed, in the case of the ordinary builder, but for the appearance on the scene of the railway contractor. In 1835 the railway contractor employed the hod-men. The use of a barrow for conveying bricks, stone, and mortar on to a heavy work, such as a bridge, was the first innovation. Then the laden barrow was hitched on to the end of a rope, and hoisted by a winch. Then the winch was turned by steam. If memory does not deceive us, the works of the Thames Embankment were among the first on which the organised use of "donkey engines," and appliances specially designed for the delivery of materials to the hand of the bricklayer or mason, was in regular swing.

But with the increase of economy, safety, and speed, attendant on the use of the steam hoist, has coincided the disappearance of the Irish hod-man. In the great depletion of thirty-eight per cent., which has taken place between 1841 and 1881 in Ireland, the loss of the earnings of the bricklayers' labourers, as well as of those of the harvest labourers, also ousted by mechanical improvements, forms an element not to be overlooked. The greater good of all may well be the result of the utilisation of coal, rather than corn, as the force-yielding combustible; but the process of substitution can not go on without the infliction of personal suffering. So it was, in the fifteenth century, when the art of the printer first impoverished the craft of the copyist. So was it, not much more than a generation back, when the nightly skies of Staffordshire and the adjoining counties were reddened by the fires of the destroyers of machinery, and when the Bull ring at Birmingham was occupied by armed and mounted troops. So, to some extent, it is on the introduction of any great substitute for human labour.

To a certain extent, no doubt, this conflict between man and the steam-engine is unavoidable. We may be loth to leave the dispossessed human labourer to suffer by the change; but it is more easy to lament his lot than to obviate the cause of suffering. And the very energy of private enterprise, to which our industrial growth is to so great an extent due, is opposed to those attempts at introducing some compensation for his disestablishment, to which the labourer is apt to think he has a rightful claim. Without offering any suggestion as to this thorny element of mechanical progress, we may remark that the true theory of mechanical improvement is not such a substitution of steam power for man power as shall lead to the starvation of the ousted labourer. What the national welfare demands of the engineer or of the capitalist is, that just in proportion to the degree in which the burden of heavy animal toil is removed from the shoulders of the working man, the time which he thus saves shall be devoted to toil that is at the same time lighter, more skilled, and more remunerative. Wherever this is the case society is the gainer, as a whole, and that not at the expense of any particular class of its members. Where, in the long run, this is not the case, the real advance in national welfare is more than questionable.

The contrast between the Old World and the New is, perhaps, more marked in respect to the mode in which human labour is affected by the introduction of mechanical power than in any other respect. It is by no means surprising that this should be the case. In an old and settled country the grooves in which various classes move are deep and decided. Throw the man out of his groove, and in nine cases out of ten you throw him on charity or on the parish. In new and partly-peopled countries the case is reversed. No one, as a rule, is educated so exclusively, or perhaps so

thoroughly, for a given career in the United States, as in parts of the Old World. But so much the more ready is every one to turn his hand to whatever offers. And the large area of unoccupied land affords a safety-valve for the increase of urban population unfitted for urban life, which is wanting in the Old World. The difference in this respect is roughly measured by the flow of emigration.

There is, however, another mode of measuring the uncompensated displacement of man by the steam-engine. It is a mode of which the outcome is somewhat startling, and such as to demand the serious consideration of any one deserving the title of a statesman. We refer to the comparative growth of mechanical power and of full occupation. To some extent we can measure the national growth in wealth. Is its growth in welfare coincident? Year after year we add so much to our steam power. Does that addition coincide with the rise of the labourer in the scale, or with the squeezing him under the track of the steam-car?

Two sources of statistical information have, within the past day or two, become available by way of furnishing a reply to this question. The replies, it must be added, are accordant. It cannot be said that they are satisfactory. The classified Census of 1881 shows a decline in the numbers of every class of industrial workers in active occupation. This decline is coincident with a large increase in the application of mechanical power, as measured by the home consumption of coal. And this latter increase, in its turn, is so far distanced by the annual increase in the United States, measured in the same way, as to give room for very serious reflection.

Thus when we find that during the last ten years agricultural labourers have decreased by a million,—making all allowance for greater precision in the later than in the earlier returns,—we have to bear in mind the fact that the great advance made in labour-saving machinery, for ploughing, harvesting, and all the services of the agriculturist, marches step by step with the fact that the land supports fewer and fewer mouths from year to year. To some extent, it will be said, this is due to the substitution of pastoral for agricultural industry. But when we come to the actual figures, we do not find them to be very reassuring. Taking Great Britain alone,—for Ireland tells the same story in much larger letters,—there were 800,000 fewer acres under corn crops in 1881 than in 1871; 200,000 fewer acres under green crops; 25,000 fewer under "other crops"; 20,000 fewer under orchards; and, *per contra*, 2,000,000 more under permanent pasture. But with this latter increase, which is such as to make the whole cultivated area in 1881 larger by 1,400,000 acres than that of 1871, there is only an increase of 674,000 cattle, balanced by a decrease of 2,540,000 sheep. Labour-saving machinery, therefore, has been a far more efficient cause of loss of work for the agricultural labourer than change in the kind of culture can have been.

Again, the numbers of miners in tin, lead, iron, and copper are greatly reduced. So are workers in wool, silk, and lace, boot-makers and straw-plaiters. In short, making allowance as desired by the Registrar-General for the exclusion of those before returned as "indefinite," out of 23,000,000 of souls in 1871, 11,000,000 were returned as having some definite occupation, while there are not more than 12,000,000 out of 26,000,000 so returned in 1881.

Now, if we turn to the main source of mechanical power, coal, and deduct the coal exported from the quantity won, we find an increase of 26 per cent. in the quantity annually retained for our own consumption in the decade. It is not easy to state with accuracy how much of the 135,000,000 tons thus returned in 1881 was used for domestic purposes, for transport, and for manufactures of a chemical nature. But allow what we may for the items, the increase in steam power, as indicated by the increase in the home consumption of coal, must have been prodigious; and the figures show that it has had the effect of displacing, rather than of facilitating, labour.

Now let us turn to the United States. We

* See also *Builder*, vol. xliii., p. 644 (November 18, 1883), and vol. xlii., p. 652 (May 19, 1883).

have not at hand the return for 1871, but take the decade 1870-1880 to compare with our own decade 1871-1881. The coal yield of the United States in 1880 was very nearly double that of 1870, the figures being 33·3 million tons for the earlier year, and 65·3 million tons for the later, a growth of 20 per cent. per annum, pretty nearly against our own 2½ per cent. per annum. Nor does this great gain measure the elastic vigour of the American collieries. The 65·3 millions of tons of 1880 have grown to 85·3 millions in 1882. This is equal to the coal production of the United Kingdom between 1862 and 1863. In another ten years, if things go on as at present, the United States will produce more coal than the United Kingdom.

To complete the parallel it would be necessary to have a classified census of the occupations in the United States, to compare with that of the United Kingdom. Meanwhile we have three elements out of four. We can compare the increase of mechanical power, among ourselves, with the decrease of human industry. Reduced to figures (subject to correction for inaccuracy of returns) we find that an increase at the rate of about 2½ per cent. per annum in steam-power, coincides with a decrease at almost exactly the same rate (allowing for increase of population, and decline in occupied persons) in human industry. No doubt the nation is richer for the change, in the ratio of the difference in the profit on steam-power and on human labour. But how about the workers? An ugly hint as to this is given by the statement that while 12,000,000*l.* were expended for relief of the poor in England and Wales in 1871, 14,400,000*l.* were so expended in 1881, an increase at the rate of 20 per cent. in ten years, or double that of the population.

The growth of mechanical power, as measured by consumption of coal, in the United States and in the United Kingdom in a decade, has been 96 per cent. in the former, and in the latter 26 per cent. And in the latter the number of emigrants in 1881 was more than 50 per cent. greater than that in 1871,—the respective numbers being (after deduction of immigrants) 198,608 in the earlier year, and 305,409 in the later. The latter figure is hard upon that of the annual increase in the population of the United Kingdom, which was 340,118 per annum for the last decade. That is to say, that for every two souls of annual increase, nearly one had to seek his living abroad. While we have not the same minute knowledge of the population of the United States, we yet are aware that coincidentally with their increase of 9½ per cent. per annum in the source of mechanical power, they are annually receiving from foreign countries a large number of fresh workers.

If it be asked, What is the good of all this study, we have no specific nostrum to propose. But to all those who have to do with the march of industry, and who can rise to a somewhat higher standpoint than that of the ledger balance for the year, the above facts will prove of startling interest. As to that, indeed, they have affected the ledger balances of 1883. How will they affect those of 1890, or of 1900?

SOME EARLY SPECIFICATIONS AND CONTRACTS OF MASTER-WORKMEN.

NOTWITHSTANDING the assertions of some unprofessional writers who have favoured the world with their views on architectural matters, plans and specifications must have been more or less in use from the earliest times in the construction of all great civil and ecclesiastical buildings. Even in respect to ordinary edifices, except those of the most simple and commonplace character, a plan and directions were indispensable for the proper carrying out of the work. Although we can reconstruct the plans of many of our ecclesiastical buildings and castles of the Middle Ages, even from the outline of their ruins, yet it would be a great pleasure to architects and others if some discovery of MS. materials placed them in possession of a number of the original plans and

specifications of these buildings. Much conjecture has existed for long years in respect to the nature of the preliminary plans of our early ecclesiastical edifices, and whether in most instances ecclesiastics supplied them, or master masons, as distinct from the practitioners of the clerical order. We have historical evidence enough of certain distinguished prelates, and other dignitaries, founding cathedrals, and of their names being associated with these and other buildings as the architects thereof, but we sorely lack that precise information which a modern architect's plan and specification furnishes us. It is, in fact, absurd to think that any one of the ecclesiastical buildings of the Middle Ages was commenced without a clearly defined plan. Our present inability to produce plans from the collections of home and foreign archives, can be explained from more than one cause, and principally when we remember the wanton and widespread destruction of documents that took place at the time of the suppression of the monastic orders. We contend that the system that now obtains in respect to planning a building must have, more or less, always obtained, with this difference, that the practitioners were different and the routine that is now recognised had not developed, because each age gave rise to new wants and modifications in the practice of every profession. In the Middle Ages we had many ecclesiastics well versed in drawing and the principles of architecture, and we had also many master workmen, or craftsmen-architects, who knew their craft both theoretically and practically. The master-masons who worked in large numbers on our early Gothic edifices were, in the first instance, no doubt, foreign craftsmen to a great extent; but, as time advanced, the native workmen completely absorbed the foreign element, and became so strong and independent that they formed themselves into recognised guilds of trade. The old term "journeyman" suggests much, for whenever an abbey or other large ecclesiastical building was contemplated our early masons and other building craftsmen migrated thereto. There has been much conjecture over the word Freemason, but it is quite certain that it was often used apart from the Masonic Society bearing that distinctive name. Whether the word "Freemason" was derived from that of freestone mason, seeing that the great majority of our ecclesiastical buildings, their decorated work particularly, were composed of an easily-worked lime or free stone, we cannot say, although the matter is suggestive. Again a free mason or other free workman would go to prove a privilege in early days, as contradistinguished from other workmen, who were rather bondsmen, or obliged to work at the will of their feudal lords and masters. As in ancient Rome so in Medieval England, architects and master workmen were under heavy responsibilities to plan and execute good work, as we shall show presently. The architects in ancient Rome, it is stated, were obliged to warrant their private buildings for ten years, and their public ones for fifteen. Every accident arising from bad construction during these periods was to be made good by them or their heirs; and if they were unable to make the necessary repairs, they were whipped, shaved, and banished. We have a significant saying recorded of Martial, in reference to the architectural profession. A friend having consulted him on the employment to which he should put his son, "Don't make him a poet or an orator," says he; "he will more quickly learn to play on the lyre or flute, and thereby enrich himself. But if the young man is dull and heavy, make him an architect." Are we to argue from this that even from an early age the practice of architecture was calculated to ripen the wits of a dull young man, and make him soon "look alive"? Whatever may have been the exact sentiments of the Romans on the adoption of architecture as a profession, we know that in the present day, particularly since the era when dishonest competitions were ushered in, aspiring and respectable young architects have had good reasons afforded to them for evidencing a sharpness in their wits.

But to return. Apart from ecclesiastical buildings and castles, the carpenters in the Middle Ages in the British Islands were the chief constructors of houses, the domestic dwellings of the people being generally of wood. An early and very interesting specification for building a house comes down to us in the civic records of London of the 2 Edward II., 1308. One Simon de Canterbury, a carpenter, came before the mayor and aldermen and agreed that he would make, at "his own proper charges, down to the locks, for William de Hanigton, pelterer [skinner], before the Feast of Easter [from Martinmas], a hall and a room, with a chimney [camino], and one ladder between the said room, and one solar over the room and ladder; also one oriole at the end of the hall beyond the high bench, and one step with an oriole from the ground to the door of the hall aforesaid, outside of that hall; and two enclosures as cellars opposite each other beneath the hall, and one enclosure for a sewer with two pipes leading to the said sewer, and one stable, in length [not stated] between the said hall and the old kitchen, and 12 ft. in width, with a solar above such stable and a garret above the solar aforesaid, and at one end of such solar there is to be a kitchen with a chimney, and there is to be an oriole between the said hall and the old chamber, 8 ft. in width." The above specification requires a little explanation in respect to some terms used. The term "sollar" may mean a sun parlour or upper room. According to "Parker's Glossary," in Medieval houses the solar was usually situated behind the dais, separated from it by the end of the hall, and had a cellar under it. These two stories together were frequently not so high as the hall, leaving the gable of the lofty roof with the window in it far above them. This, says our authority, was the lord's chamber, and there was generally a small opening from the solar into the hall, from which the lord could overlook the proceedings and hear all that passed. The oriole first named in the specification was very likely a recess with a bay-window, the second-named oriole possibly a kind of porch, and the last-named may mean a room with bay-windows.

In the English Medieval castles, or at least in some of them, adjoining to the great chamber were oratories, and these were lighted by a large embowed or bay-window, called an oriole or oriel. Old Lydgate, describing a lady, writes,—

"In her oryall there she was
Cloysed well with royall glas."

The estimate or sum that Simon de Canterbury was to receive for his work was "9*l.* 5*s.* 4*d.* sterling, half a hundred of eastern marten skins, fur for a woman's hood, and fur for a robe for him, the said Simon," &c. Money must have had a great purchasing value in the commencement of the fourteenth century, but the carpenter master-workman was condescending enough to take kind as well as money from the wealthy City pelterer. As the house was nearly all of timber, the interval between Martinmas and Easter gave ample time for its completion.

In some of the agreements between the master-workmen and their ecclesiastical and lordly patrons in the Middle Ages, many of the terms are so obscure or obsolete in respect to workmanship that their import can be barely conjectured. Probably not a few of the technical terms used were provincial or local, and not generally understood over the country. In the agreement between the Commissioners of Richard, Duke of York, and W. Horwood, free mason, for the building of the chapel in the college of Fotheringhay, the latter stipulates in severely-binding terms: "To yield up hys body to prison at my lord's wyl, and all his moveable goods," in case of non-performance; and further: "he shall neither sett nor nor fewer freemasons, roghe-setters, ne leys thereupon but as shall be ordeigned." The duke was to find all materials, "ropes, bolts, scaffolds, gynnes, &c., and all other werke that length to such a body, nave, isles [aisles], &c."

In the earlier periods of the Gothic style, it would appear from certain passages in the annals of some of our ecclesiastical establish-

ments, that the members of the orders and the monks took a more active part in the planning and execution of the works than at a later date, even in sundry instances working at the masonic craft with their own hands. As Gothic architecture developed, and passed into the richly Decorated and the Late Perpendicular florid periods, the responsibility of much of the work executed devolved upon the master-workmen employed. In the short era that culminated in what is known as fan-vaulting, master-masons of great repute bound themselves in stringent terms to complete their work in a stipulated time for stated sums. The names of a few of these great master-masons have reached us, and their memories deserve to live. In connexion with the vaulting at St. George's Chapel, Windsor; the choir of Winchester; Henry VII.'s Chapel, Westminster; and King's College Chapel, Cambridge, there is exquisite work, and with the most of it certain master-masons' names occur, as if they were the head of their profession at the time. In respect to the work at King's College Chapel, there is an indenture, dated 1513, by which J. Westall and Henry Severick engage to finish the vaulting in three years, to be paid 1200*l.*, 100*l.* for each severity upon its completion, "and so from tyme to tyme until all the twelve severies be fully and partly made and performed." The names of John Hylmer and William Vertue, free masons, are associated with the work at St. George's Chapel. They undertook the roof of the choir for 700*l.* in 1506, and bound themselves to complete it before Christmas, 1508. On the chapels and halls of All Souls and Magdalene, Oxford, worked three skilful master-masons,—John Druel and Roger Keys, on the former, and William Orcharde on the latter. They were employed by Chicheley and Waynflete, who endeavoured with some success to follow the great examples in Gothic set them by Wykeham. Some of the superb vaulted work on which Westall and Severick were engaged at the close of Henry VII.'s reign was finished in the succeeding reign, but it was not long until a pelting storm of destruction swept over the land under the *régné* of Henry VIII., and the practice of a glorious style of architecture perished almost out of sight, save in debased forms. In an indenture by Henry VIII. to J. Westall and Henry Severick, it states:—"The vaulting to be sett up after the best handlyng and forme of good workmanship according to the plat [plan] thereof, made and signed by the hands of the lords executors of the will of Henry VII." In an indenture of the 5th of Henry VIII. to J. Westall, the vaulting of two porches and seven chapels is put down at 20*l.* each, and there was a binding in 400*l.* penalty, and to keep forty freemasons "continually working on the same." The building workmen of the period to which we are alluding could not work and leave off when they liked, and they were held responsible for bad conduct and workmanship. The following items show the subordination of the masons to their masters:—"And in case any mason or other labourer shall be found unprofitable, or any of such yll demeanour, whereby the werke should be hindered or the company misordered, not doing their duties, &c., then the said surveyor to endeavor himself to perform them by such wayes as hath byn there used before this tyme." Henry VII. has been accused of excessive avarice, but we find him engaged during the whole of his reign in magnificent architectural works at both Windsor and Westminster, and providing in his will ample means for the completion of the work at King's College, Cambridge. Although marvels in stone vaulting justly excite our admiration, we have several splendid examples of open timber roofing in this country, which go to prove that our master workmen of the carpenters' craft were not inferior in geometrical knowledge and constructive skill to their masonic brethren of the building art.

The conditions that obtained in architectural practice and construction in the fourteenth, fifteenth, and sixteenth centuries are not possible now, but there is no reason why the public spirit and love of art that inspired great

founders, architects, and building workmen of old should not be evoked again for the credit of the State and the common weal.

NOTES.

The new street from King William-street to the Tower was formally opened on Friday, last week, by a small party of those officially, or otherwise directly interested in the matter, including Sir E. Watkin, M.P., and the representatives of various railway companies, the Chairman of the Commissioners of Sewers, &c. The street has been made at the cost of the Metropolitan and District Railways, the Commissioners of Sewers, and the Metropolitan Board of Works. According to a newspaper report, it was generally admitted that a wide and excellent street had been secured, "and one which would tend, to some extent, to alleviate the congested traffic of the neighbourhood." This sentence is an example of that curious and innocent superstition which crops up every now and then in reference to Metropolitan improvements, that, to "relieve congested traffic," it is only necessary to make a new street in contact with the point of "congestion." It does not seem to occur to many people to consider whether the operation of the said street will be to take traffic away from or to bring traffic up to, the point of pressure. The pressure at the neighbourhood referred to is mainly owing to the convergence of several crowded streets upon the access to London Bridge, and this is to be "relieved" by bringing yet another thoroughfare to meet the others at the same point, at the cost of a million and a quarter. That part of the traffic which wishes to go from that point to the Tower will, no doubt, be benefited, but what proportion is that of the whole?

It is with unfeigned regret, for more reasons than one, that we record the fact that the Royal Academy, at their general meeting on Wednesday last, not only again ignored the claims of Mr. Alfred Hunt to such distinction as associateship in their body may be supposed to confer, but, as if the more to mark the slight, elected a landscape-painter who, to say the least, had no claims to the compliment in any way commensurate with those of the highly-gifted and sensitive man of genius whom they refuse to adopt. Mr. Colin Hunter, the new Associate, is a mannerist with a somewhat novel and powerful style, and that is all. The contrast between his and Mr. Hunt's claims might be effectively shown even by the juxtaposition of two pictures in last year's Academy, the "North-country Stream" with its finished and delicate study of every portion of the scene, and the "Pebbled Shore" of the new A.R.A., with waves in parallel ridges of something that looked hard and frozen, as if one could step over it but for the uncomfortable walking on such sharp edges. But how would it be if Mr. Colin Hunter's pictures were collected in one room, as Mr. Hunt's are now? Such an experiment would prove tolerably convincing, we suspect. Mr. Hunt can afford to wait, perhaps. We are not so sure that the Academy can. In the matter of landscape, they seem bent on stultifying themselves.

From a report under heading "Continental Notes" in another column, it would appear that, to a certain extent, the thoughts and suggestions on the subject of dwellings of the poor, which are so much tossed about among ourselves at present, are being repeated in a kind of parallel column in Paris, leading to conclusions similar, in great measure, to those which we have advocated. The general tendency of the meeting on the subject at the Académie des Sciences Morales et Politiques was towards preferring private action to State interference, condemning the hasty demolition of habitations without making provision to replace them, and emphasising the importance of the moral improvement of the lower orders, as in the long run the most certain means of elevating their condition. The factor of educational improvement, without which the moral and hygienic improvement is hardly

possible, seems somehow to have dropped out of the minds of the French philanthropists.

The long list of accidents during the recent gale affords disagreeably practical hints as to the vexed subject of wind pressure. Among the accidents are two very similar and unusual ones, cases in which pedestrians were blown off their feet and under the wheels of vehicles; one case, that of a man who was blown down in front of a tramcar while crossing High-street, Whitechapel, resulting in very serious injury. A horse and van crossing Blackfriars-bridge were turned over on the road. A similar accident at Portsmouth cost the driver his life, the cart being blown over on him; and other cases of the same kind are reported, fortunately without loss of life. We should like to have more definite information about the report of a railway engine-driver, mentioned in some of the daily papers, to the effect that his engine was at times "nearly brought to a standstill" by the force of the wind, and that when caught by a side wind there was some danger of some of the carriages being blown off the rails. That of course must have been by overturning, which would sooner happen than the lifting of the flange over the rail, at all events. But that the wind could really operate so forcibly upon the comparatively narrow area of the front of an engine as to overcome its weight, momentum, and mechanical power to such a degree as the report would indicate, seems rather problematical. The question has, of course, some bearing on the causes of the too memorable calamity of the Tay Bridge.

A CIRCULAR announcing the impending appearance of a new English dictionary, which has been in preparation "for a quarter of a century," accompanied by a specimen page of the work, threatens an eclipse of Walker and the other worthies who have grappled with the English language. The new dictionary is edited by Dr. Murray, President of the Philological Society, and numbers some brilliant names among its contributors; though, as the preparations of a quarter of a century have not got farther than the promise of a Part I., taking us from "A" to "Ant," most of us may fear that we shall have gone a good deal farther than that before the end of the work appears. The specimen page, however, indicates that the dictionary, if carried through on the same lines, may be a storehouse of valuable information for our great-grandchildren, if they should have any bookshelves large enough to hold it. The intention seems to be to elucidate the entire scientific history of each word; indeed, the matter under the head "alum" might be supposed to come out of a chemical dictionary. There are, we may suggest, a host of words connected with art and architecture which may afford ample scope for the learning and ingenuity of the contributors.

ONE of those pleasant little jokes which occasionally enliven the dull history of architectural competitions reaches us from a certain town in Yorkshire, where there has been an exciting struggle among the local architects for the commission for a proposed new Board School, the cost of which was not to exceed 1,000*l.*, on which sum the successful architect was to receive three per cent. Much spirit and energy seems to have been evoked in the struggle for this prize, and when three sets of drawings were at last selected, out of the number sent in by aspiring candidates for fame, it was found, "to the great surprise of the committee" (extraordinary how committees continue to be surprised on such occasions) that all three designs were by the same firm. Our own surprise, and that of most people who have any regard for the dignity of the architectural profession, would not be that all the three selected designs should be "found to be" by one favoured firm, so much as that any firm should take the trouble to send in three designs for the purpose of hooking so small, insignificant, and unrespectable a bait. The history of architectural competitions repeats itself a good

deal, but it does not usually repeat itself quite as much as this.

A CORRESPONDENT from Hammersmith calls our attention to a recent decision of one of the magistrates of that district, Mr. Shiel, to the effect that "a way 8 ft. wide may have buildings erected alongside of it because it is an old way." A summons, it appears, was taken out under Sections 25 and 26 Vict., cap. 102, which is to the effect that "No existing road, passage, or way being of less width than 40 ft. shall be hereafter formed or laid out for building as a street for the purposes of a carriage-traffic unless such road or way be widened to the full extent of 40 ft., or for the purposes of foot traffic only unless such passage or way be widened to the full width of 20 ft." The reading of the Act seems to our perhaps not legally constituted mind conclusive in favour of the necessity of widening the road, and preserving, as our correspondent says, "rivers and reservoirs of air" amid a district where building is rapidly increasing; otherwise, what does the phrase "existing road" mean? If Mr. Shiel can make out his reading to be good law, so much the worse for the law. There can be no doubt that it is bad sanitation.

THERE seems to have been a sort of "Belt case" going on at New York, in which ancient, instead of modern, statues were concerned. The *causa belli* was the genuine or fallacious character of the numerous statues and pieces of statues brought by General Cesnola from Cyprus, and which our unenlightened Government allowed to pass over the waters to the enlightenment of the American mind. A Mr. Feuardent, apparently gifted with an impulsive character answering to his rather alarming name, has been asserting for three years back that General Cesnola's collection of statues was "a fraudulent patchwork of unrelated parts." These very bitter words, certainly, and it is no wonder that General Cesnola should have been moved to declaring that Mr. Feuardent's statements were "malicious"; an opinion which had some ground in the fact that the latter had been much chagrined by having lectured on a small figure in the collection under the impression it represented "Hope," whereas, when put into a bath and well scoured, the figure came out, in the opinion of experts, as "Venus." On the other hand, it certainly seems that General Cesnola, or his acolytes, had been guilty of grave indiscretions. In order to get the collection into the best "form" for a public inspection, somewhat hasty inferences seem to have been drawn; the legs of Hercules were put on wrong, and a broken dove in the hand of a Venus statue was supplied with a wooden tail and covered with whitewash. General Cesnola, no doubt, was personally innocent of these well-meant attempts at restoration, but, like a candidate accused of bribery, he has had to be responsible for his agents. From a patriotic point of view, however, it is disappointing to find that the last few weeks have rehabilitated "Cesnola among the broken gods" in the eyes of the aesthetes of New York, and we cannot flatter ourselves that we have escaped being taken in by refusing to purchase the collection. A correspondent of the *Times* tells us that the trial was a very dull affair, except at the moments when this or that statue or part of a statue was unveiled for inspection; but he anticipates that there will be a revival of interest when "the stalwart Mr. Bangs" and "the keen Mr. Choate" declaim for the plaintiff and defendant respectively. The opinion of Mr. Bangs and Mr. Choate on the authenticity of ancient Cypriote sculpture will, no doubt, be of much value, and we shall look with interest for this promised lesson in archaeology.

THE Manchester Ship Canal Bill passed the Examiners for the Standing Orders Committee on the 24th of January, and will thus come before the Committee some six weeks earlier in the session than was the case last year. In addition to this good start, the promoters have this year supplied several important defects in the first Bill. A sum of 1,390,000, is provided

for the improvements in the estuary required in order to insure a navigable channel from Manchester to the sea. An equal sum is allotted for the construction of docks and warehouses at Manchester and at Warrington. Upwards of 16,000*l.* is allowed for the construction of roads from the docks to Manchester and Salford, and water entrance to Manchester is also designed. These points were omitted in the first Bill. A lift is also shown in the plans to provide for the crossing of the Bridgewater Canal over the ship canal at Barton, the site of the famous aqueduct, by Brindley, which has already been widened twice since its first construction. The total estimate for the enterprise now stands at 6,904,000*l.*

SKETCHES AND STUDIES IN SPAIN.

LOGROÑO,---NAVARRA.

SPAIN, although one of the oldest and most interesting of European countries, is yet one of the least studied and generally known. Exceptions made of the Alhambra, Sevilla, Cordoba, and the cathedrals of Burgos, Toledo, and some others, it would not be so very far wrong to say that Spain is an unknown country. Notwithstanding the labours of Ford, Prescott, Street, and the sketches of Washington Irving and Longfellow, the student comes across evidence every day of the wealth of materials still unworked. When we reflect that cities, such as Malaga and Cadiz, are among the oldest in Europe (we are here speaking of their existence as cities, not of their actual walls); that the Phœnicians had colonies in Spain 3,000 years ago; and that the Basque race, like the language, is, probably, the oldest to be found throughout the Continent, a feeling of surprise is natural on finding its antiquities and art remains so little generally known.

At Rocadillo, on an eminence favourably situated at the north end of Gibraltar Bay, not only are still found remains of a Roman amphitheatre, but likewise the walls of a citadel, referred by Ford to the Phœnicians. Walls of like character are to be found in Ronda (Andalusia) and in Estella (Navarra).

The foundation of Ronda is referred by the above authority to the Moors, but that opinion seems at variance with the facts. The whole aspect of this ancient city, its walls, gates, and the bricks of which it is built, are all evidently Roman. The Arabs merely altered and added to the pre-existing Roman city. Finally, the ancient walls, yet seen in the citadel, seem to date back its foundations long before the Romans came to Spain.

Looking now towards the north, we may call attention to the Ebro Valley about Logroño, as full of interest, geologically and historically. Those peculiar mounds, occasionally,—as in the case of Aosta, in Italy,—reaching to mountains and called *moraines*, abound on every side, indicating the action of far-extending glaciers in ages long ago. Beneath one of these mounds, not far away from the forenamed city, flows the Ebro, and the constant action of its waters during ages unknown has worn away the clay, drift, and hard conglomerate rock, so as to leave exposed a precipitous face of reddish cliff. The summit has been fortified, and remains of an ancient city are there found. According to tradition, followed by some writers and preserved in the name of the place, this is the site of ancient Cantabria, capital of the province so-called. Logroño (Lucronium) is Latin, the general opinion being that its site,—on the opposite or right bank of the Ebro,—is the same as that of Julio-Briga.

Logroño once possessed a goodly share of Gothic fane, dating, like most of the finest examples of that style, from the thirteenth century. These have been so much changed and disfigured by Renaissance additions, as not only to destroy the original fine effect, but so also as to render their history and parentage difficult to trace. Among the most lamentable effects of the Renaissance phase in Spain was that of loading the interior of churches with heavy, incongruous choirs, often seen in the very middle of the edifice, with a passage from the high altar railed off for the use of the choristers. The Logroño churches have suffered greatly in this respect, especially so Santa Maria de la Redonda, which, notwithstanding the height of its nave and aisles, appears deformed, on account probably of its *core* and

trascoro (or semicircle of chapels behind the choir, and at its west end) having been carved out of the original stately Gothic fane. Santiago has suffered less than the Redonda, due to the fact that its original thirteenth-century character has been more respected. Santa Maria del Palacio still boasts a Mediaeval spire and one side of a thirteenth-century cloister. The interior of the church exhibits a characteristic study. From the doorway an *atrium* behind the Renaissance choir, with openings into the aisles, leads to the cloister before mentioned. From this *atrium* you see Romanesque, Gothic, and Renaissance mingled together in a strange medley. It is thus apparent that the twelfth century created the original church; then came the thirteenth, with its influence, resulting apparently in a rebuilding or enlargement of the original; the fourteenth added some arches and ornaments; until, at last, came the Renaissance, bringing in its overweighted domes, piers, and masonry, and so throwing a cloud over the once peerless beauty of the Mediaeval temple.

Before we pass on to another province, we may express our regret at the recent inconsiderate destruction of a valuable monument,—in some respects the most valuable Logroño contained,—the ancient stone bridge of the twelfth and thirteenth centuries. Owing to some dilapidations in the half furthest from the city, it was determined to sweep away the Mediaeval structure, replacing it by another with arches of wider span. This resolution would not have been so regrettable were it not that the old bridge, with its castellated turrets and embattled parapet, had been the scene, on more than one occasion, of memorable feats of arms against the French. Hence it has figured upon the shield of the city's arms since the days of Charles V. The original round-arch bridge of the twelfth century had been widened, strengthened by massive angular buttresses, and in part replaced by pointed arches in the next century, and so in some measure deserved preservation, apart from its historical memories, redounding so much to the city's glory.

Navarre contains Mediaeval remains of great interest. Its capital, Pamplona, owns several fine churches, the cathedral being, as to its interior, one of the most pleasing, and its Gothic of the purest, we have so far come across in Spain. On the day of our visit we saw carried out of the cathedral pillars and other portions of an altar, exactly in the style of the ivory diptychs of the fourth and fifth centuries.

But the ruined Cistercian Monastery of Iruña, some six miles north-west of Estella, situated in the depths of a retired and sombre valley, contains remains of extreme beauty, hardly excelled by the finest Gothic works of more northern lands. Here, too, we meet with Romanesque, in process of developing into Gothic. "Round-arch Gothic," one was tempted to call it, in the style of Mr. Fergusson. However, the illusion was of short duration; the round arch evidently belonged to the work of one century, the Gothic to that of another. After all, then, it is Mr. Ruskin who wins the palm, and Round-arch architecture is Romanesque, while Pointed is Gothic. At Iruña, the ruined cloisters are the chief attraction. The delicacy of the window tracery and the carved capitals we never remember to have seen surpassed. Our chief delight was that of meeting with Gothic of so pure a type, so far south as Spanish Navarra.

Estella itself is eminently interesting from every point of view. Nestling in a crescent-shaped valley, and fortified by mountains on every side, its naturally strong position doubtless attracted settlers from time immemorial. To the eye of the artist or the poet, the charms of the vivid impressions produced by its deeply-indented mountain outlines, contrasting with the verdure of the crescent below, bounded by the winding Ega, must prove irresistible. To the student of Mediaeval art its attractions could hardly be surpassed. In the Middle Ages Estella and its vicinity were remarkable for religious foundations. Some of these we now proceed to study.

We commence with the ruined Convent of Santo Domingo. This was one of the magnificent edifices which the piety of the Middle Ages spread abroad in all Catholic lands. To give an idea of the splendour of its proportions, it may be mentioned that the refectory measured some 130 ft. long; the convent church, 160 ft.; and that the ruins include a third grand division in two stories, on the

west side, starting from the north-west angle, probably devoted to the use of novices.

The style is fully-developed Gothic of the thirteenth century, though the slender pillars of the western doorway, seem almost to point to a later development. There is a tomb in the Decorated style on the north side of the church, with a mutilated statue of a patroness beneath the richly-worked canopy; and another, on the same side, of a father prior: both abandoned to neglect, mutilation, desecration. The Gothic seen in the lofty arches, windows, and doorways is pure and noble in sentiment, though the delicacy in detail is less striking than at Irazua.

The situation of Santo Domingo on the steep side of the line of metamorphic cliffs to the east and south-east of Estella is very advantageous. A feeling of regret came over the mind on viewing the beautiful chapter-house desecrated and ruined, gigantic ivy filling up the apertures of its elegant trefoil windows, the geometric forms saved up by modern ignorance and avarice.

Immediately below Santo Domingo, and seeming almost part of its appurtenances is San Sepulcro, the walls of which, part of an exterior arch, and remains of round pillars, with also two ancient statues outside (dating from about the tenth century) are all Romanesque, while the façade towards the street is Gothic of the thirteenth century. The doorway is the finest, most deeply-recessed, and purest Gothic portal in Estella. It consists of six pairs of slender shafts on either side, a string of angels crowning the point of the arch. In the tympanum are subjects in relief in three tiers, the Crucifixion in the topmost; hell, flanked by a scene from the Resurrection, in the middle; and oracles, or figures in supplication, below. On each side of the doorway, and high in the façade, are figures of the apostles beneath Gothic canopies, all in the style of the time. The interior presents nothing of special interest, the general sentiment is Romanesque, with modern alterations and additions.

Our illustration shows a view of the Calle del Mercado, Logroño, in the strong sunlight and contrasting shadows of a southern clime. Its leading feature is the south side and towers of Santa Maria de la Redonda. The walls and clearstory as far west as the porch are Gothic, and the remainder evidently later, apparently belonging to the seventeenth and eighteenth period. The upper portions of the towers, or spires, if we may call them so, like many others seen in Spain, present a mixture of styles,—Byzantine, Arabic, and Gothic,—confused together in that peculiar medley found only in the period of the Renaissance. There is, indeed, a faint resemblance to the real Gothic spire and pinnacles in the distant view, otherwise it might seem hard to say what Gothic had to do with these spires, savouring rather of Rococo and Churriguera. However, the height seems to show that the beauty of Gothic form had not been entirely absent from the mind of the designer.

Santa Maria de la Redonda is in process of being converted into the cathedral of the diocese, and since our illustration was taken the works have begun. Instead of lengthening the original ground-plan, in the style of the thirteenth century, we are informed that the additions have been planned in the style of the Renaissance.

BUILDING RISKS AND THEIR INCIDENCE.*

ALL building works involve risks:—Risks to builders; risks to employers.

The risks usually considered to attach to builders are:—Changes in price of labour, enforced at times by strikes; alteration in the efficiency of labour; changes in price of materials; the difficulties arising from having to obtain special materials in place of those usually procurable; the state of the bottom obtainable for building, and the consequent extent of the foundations of the proposed structure; the use of materials from the estate, such as bricks, stone, timber, and the value of them for the purpose of the erection; the state of the adjoining premises as affected by the proposed works, and the condition and value of the old materials which may have to be re-used; risk of irregularity of payments, and the failure of the

employer; penalty as to time of completion; risk of accident to the public and to workmen employed; the idiosyncrasies of architects, as shown in their explanations of their own terms; the unexpected views of the intentions of the Legislature by the administrators of Acts of Parliament; the whims of clerks of works; the danger of inaccuracies in the estimates.

The risks usually considered to attach to employers are:—Excess in cost over the contemplated expenditure; delay in completion beyond the anticipated period, occasioned by strikes, tempest, frost, or other inclement weather, and other causes, and the possible want of occupation for the building in consequence of such delay, involving sometimes the loss of anticipated business; delays and difficulties from the failure of the builder; defects in workmanship and material, after all precautions taken; in case of the employment of an architect strange to the locality, his non-acquaintance with local customs and materials.

Though these several risks may be divided into two classes they are originally all those of the employer; he engages an architect to minimise them for him. Some of them he can get rid of, others remain. If he throws on the builder unreasonable risks (sporting items in the bill of quantities), he must pay heavily for getting rid of them.

There are cases in which risks can be transmitted, and others where they must be retained. Whoever draws up a reasonable contract will not endeavour to throw unreasonable risks on to the builder. The experience of builders varies as to what they will undertake as risks, and difficulties are sure to exist if builders undertake risks with the bearing of which they are unacquainted.

Before considering the relative advantages of different modes of contracting, some observations are here offered on the mode of dealing with the several risks above mentioned.

The risks as to variations in prices and efficiency of ordinary labour and materials should lie with the builder.

The employment of "other tradesmen," specially named by the employer or architect, for portions of the work, introduces fresh difficulties for builders, and makes it almost impossible to carry out the works by the intended date of completion, as such tradesmen are not usually bound to time in the same manner as the general contractor, and the latter has not usually the power of making a free contract with them.

The extent of foundation required is usually a risk retained by the employer. It is often possible to obtain extra accommodation from additional foundations, which is to the employer's advantage. It is sometimes almost impossible to execute works in foundations which, in the first instance, it seemed reasonable to propose.

The works to adjoining premises, including party-walls, are invariably attended with risks which generally should be retained, but must sometimes be transferred. The liability occasionally arising to rebuild, instead of repairing, a party-wall, and the expenses in consequence, including that of removal, to the adjoining owners, may be so greatly varied in execution, that the possibility of transferring the risk to the builder by any usual clause is more than doubtful.

The amount of the penalty inserted in a contract for delay in the completion of the works should be based on some equitable principle, and should be commensurate with the loss from non-occupation. This may be calculated, as interest on money expended, in some cases on buildings only, in others on buildings and site, and there are cases where the value of expected trade may be introduced, but, in the latter case, it would seem reasonable that it be mentioned in the contract.

The time allowed for additional works should be allowed in case of variations, on the whole amount altered or reconsidered, and cannot practically be calculated on the value of net extra cost alone.

The present increased actual value of land, and the increased proportion which the value of the site now bears to the total cost of town buildings of which it forms a part (and which value has to be considered in many instances in calculating the amount of penalty), has led to haste in the conduct of the work, to throwing points of detail over until the time comes for their execution, and to the drawings and specification being incomplete and really insufficient

either for estimating or for carrying out the works.

Such being risks attendant on the erection of most buildings, there are cases in which employers increase their risks by the course of their proceedings. A public body erecting a building of a new sort increases the risks by introducing the element of an architectural competition for the design, and by stating a fixed sum as the principal guiding element in the conduct of the works.

Another case is that where there is a contract for an entire work, with the rates applicable by special clauses to future variations, and where risk of complication is introduced by every separate private bargain made in the course of the works either by the architect or by the employer with the builder.

Such agreements are most difficult to interpret, and, even if clearly defined, introduce two separate systems of settling a value for the same work.

Another element of risk is introduced by changes in the plan or in the class of work to be used, made after the receipt of the tenders and before the contract is signed; such changes, if considerable, complicate the accounts and are most difficult of statement in revising the drawings and specification.

Reasonable care may make quantities and specification hang together if written continuously, but it is doubted if it is possible so to alter a specification for a large and complicated building, which has been accurate at first, as that it shall be correct after considerable variations shall have been introduced.

And here may be considered that element of professional responsibility which is so generally introduced in the conduct of works, and which should result in the proper distribution of risks between the employer, the architect, the surveyor, and the builder.

An employer building on his own estate employs his own men and materials. If erecting a new building, he takes all risks himself, and those risks are the least possible in quantity. If altering an old building, the risks are greater, the uncertainty as to time to be occupied by the works is increased, the cost of the works is greater, and the difficulty of subletting portions or trades, if the proprietor is disposed to do so, is increased.

If a building is erected in a town, there are the further risks of dealing with adjoining properties and with public authorities. These require special knowledge, and builders are to be found who will take these risks as an ordinary business, and also the responsibility of the working up the whole into a complete house or building, such responsibility being expressed by the laws relating to contract for the production of a complete chattel.

If the employer requires special architectural design, an architect is employed, who is the agent of the employer, and is responsible to bring larger knowledge of dealing with risks to bear on each a subject than either the employer or the builder may possess. In arranging a contract under such circumstances, the cost of materials and labour is to be supposed to some extent to be known by all parties, and a profit is added to cover the risks which cannot be particularised, and for the reward of the builder.

Employers, and with reason, generally doubt the expediency of placing a contract in the hands of a builder without competition, hence the system of tendering; and, were the specification always clear, and no sporting risks introduced, each builder tendering would prepare his own estimate; but the multiplication of these more difficult risks, and the want of exactness in defining them, are some of the reasons for the introduction of an intermediate person who himself takes the risk of the quantities, and furnishes them, as far as they can be accurately measured, and whose business it is to point out the nature of all sporting risks which may be contingent on the contract.

It is very difficult to define some of these risks, as it is difficult to define the modes of construction intended to be adopted, and when severe competition is introduced it becomes at some time a question what is to be considered the contract with reference to such matters. What the architect intended to express may not be the fair meaning of the words he used, and so his intention may not be the explanation of the contract.

Upon the fair rendering in the quantities of the terms stated by the architect depends, most

* A paper read at the ordinary general meeting of the Surveyors' Institution, on Monday evening last, by Mr. T. M. Rickman, Fellow of the Institution.

likely, whether or no the builders tendering take sufficient pains to ascertain beforehand what these risks are.

If all of the risks are not stated in the specification, except under general headings, if all of them are not ascertained by the measuring surveyor in preparing the quantities, it would seem questionable whether the builder who contracts for the work is responsible for such risks so omitted, and, if not, it would seem that they are still on the shoulders of the building-owner.

Reviewing the history of the course of business, we find:—*First.* The architect employed by the building-owner, employing workmen; all risks being at the cost of the employer. *Second.* The architect and builder combined, with or without contract, the employer, by selection of an architect, devolving on him, as he might think, all risks, but in that probably mistaken. *Third.* The employment of an architect, and under him of contractors for separate trades or of a builder for all trades. Both parties recognised by the employer, with larger chance that all the risks should be transferred from the employer, but with a probability that some of them may reach him after all. *Fourth.* The introduction of a quantity-taker, either unrecognised by the architect or employer; or recognised by the architect, not by the employer; or recognised by the employer; or appointed by the employer,—with a further complication in the three last cases, not unfrequently introduced, by the fact of the architect being the quantity-taker.

In each of the above-mentioned cases, more or less of the risks are become the responsibilities of the several parties engaged by the building-owner; but if any one of them, architect, quantity-taker, or builder, has not done his duty in preparing the contract and the estimate therefrom, and, as is also possible, if the employer has not assisted as he ought, such neglected work may make a sore place in settling up the accounts, and the employer may find himself still involved in risks which he thought to have transferred.

A knowledge of the relative positions occupied by these several parties is gradually reaching the class of persons who are likely to build. There are many among them who are desirous of shirking their true position, but those who have had experience (or who have still more fortunately obtained their experience from others) are becoming aware that the nominal shifting of all responsibility from off the shoulders of the employer on the subject of open questions or undecidable risks, is not a course which will secure for him the execution of the work for a fixed sum, without chance of excess or further trouble; nor does it secure the entire avoidance of questions which may have to be referred.

We are now more in a position to consider the relative advantages of different modes of contracting and the employment therein of the various professional persons usually engaged, with the extent of devolution of risks accompanying each. Those to which attention is here called are as follow:—(a.) Daywork prices for labour and materials. (b.) A fixed sum for the whole, obtained from the builder, without the intervention of a surveyor. (c.) A fixed sum for the whole, obtained by quantities furnished, priced or unpriced, by a surveyor. (d.) Measure and value on a schedule. The schedule priced by builder on tender. The schedule priced by surveyor and tendered at a percentage on or off. (e.) An agreed percentage on prime cost.

The principal point to which attention is called is the question as to which of the above contracts distributes the risks before mentioned most equitably.

(A.) *The Employment of a Contractor who charges by Daywork for Labour and Materials at Agreed Prices or at Current Rates.*—The risks of alteration in price of labour, and, to some extent, in the efficiency of labour, and the risk of alteration in the price of materials, are in this case on the builder, and, if payments are regular, all other risks remain on the employer. There are many cases in which the changes possible in the cost of labour and materials are the most important risks, and the only ones which can be taken off the employer's hands. Many large accounts for repairs must be thus treated, and the accounts for works are so treated at times when the employer and builder are equally acquainted with construction, and when the employer is his own clerk of works.

(B.) *A Fixed Sum for the Whole, obtained Direct from the Builder.*—All the risks which I have given as the builder's are supposed to be transferred to him under this arrangement, but the extent of the employer's risks will depend upon the carefulness with which the specification has been drawn, which means a sufficient examination into the various questions by the employer or his architect beforehand. In default of this sufficient examination, the following risks will practically remain on the employer:—Foundations; adjoining premises; some public requirements, and the difficulty of obtaining special materials; besides others, which, if not fully considered, may become the subject of a reference.

The employer's risks which this course is intended to pass on to the builder are,—excess in cost, delay in completion, and class of workmanship. The extent to which this is really effected depends again on the specification and sufficient preliminary inquiries; in fact, on the reasonableness of the specification.

Special attention has been called to the necessity of preliminary investigation, because on it depends practically the extent of contingencies which have to be provided for. A builder may insert a sum for all such things as he has not taken the trouble to measure or inquire into, but that is not business, and it is a course which a measuring-surveyor cannot adopt. The object of competition is to avoid the existence of such an item, and to obtain, at lowest market price, a specified combination of recognised marketable materials. Engineers and architects preparing their own quantities may insert a provisional item of 10 per cent. to cover their carelessness, but the result of such an item must be, if disputed, to throw the whole contract open to a careful remeasurement.

(C.) *A Fixed Sum for the Whole, obtained from Quantities furnished by a Measuring Surveyor.*—It is not intended here to discuss the various positions occasionally taken by the measuring-surveyor, and the variations in extent of the authority which consequently attaches to his quantities. Whether he is a builder's clerk, a builder who has relinquished his original business, an architect's clerk, an architect who has relinquished, or is prepared to relinquish, his original business, or a trained assistant to an expert,—any of these may be his origin. His appointment may come from some only of the builders, from all the builders, with or without touting, from the architect, from the client. There are risks that he may do injustice to the builder, to the architect, to the client. His fees may be allowed fairly, including or not including responsibility for errors, though they may be inserted at a very high rate, and the architect may mulct him in various ways; or the client may cut down his charges till they are insufficient for producing effective quantities. He may prepare them on speculation or with a limited guarantee. In many of the above cases there arises a special risk that his work be not well and fairly done. The conclusion to be drawn is that upon the position in which the measuring-surveyor is placed and the independence of his examination of all risks, intended to be devolved from the employer to the builder, depends the effect of the contract as regards the transfer of those risks.

When the quantities furnished from the information at the disposal of the builder are prepared with sufficient care, such a contract as is now under consideration gives the builder the following risks:—

Alteration in price and efficiency of labour. Responsibility to complete by a fixed time under a penalty.

The risks connected with adjoining buildings, old materials, use of estate materials, and of special tradesmen's work, are reduced to a minimum, but still probably remain on the employer.

The risks as to regularity of payments, as to the idiosyncrasies of the architect and of the clerk of works, are taken by the builder, and the accuracy of the quantities is either taken by the measuring-surveyor or not, according as it has been arranged that he should be paid.

Of those risks which I have termed employer's risks, means are herein taken to reduce those of excess of cost and of delay in completion. The quality of the work depends on the builder selected.

One important element in the effectual transfer of many of the risks enumerated, is careful settlement beforehand of what is

intended to be done. In some cases this is possible, and for this purpose the adoption of the system of a contract with the assistance of quantities is the proper course.

If it be objected that the careful consideration here pointed out is no business of the surveyor, but is altogether that of the architect, the natural reply is, that in the proper view of the case, this careful consideration, this endeavour to eliminate questionable risks, and to clear up questions which might lead to misunderstanding in the course of the work, and consequent contention, is one of the *raison d'être* of the surveyor's position; that if he maintains this he will maintain the standing of the measuring-surveyor, as a professional man; and if he lets go of this position, and allows, knowingly or carelessly, any question to remain not cleared up, which a little care or careful interrogation on his part at the right moment might clear up, then he becomes part of a class whose one-sided and close-sailing evidence has brought much obloquy on the profession.

A class of cases has now to be considered where it is not possible to fix beforehand the extent or nature of the buildings which it is intended to erect.

(D.) *Measure and Value on a Schedule.*—In such cases the ordinary course is to arrange that the work executed shall be measured and valued at an agreed schedule. The changes in the incidence of building risks in this case from the last-mentioned are as follow:—

It is very difficult to fix a time for the completion of the work. The questions of adjoining buildings, old materials, use of estate materials, remain with the employer almost entirely, and, in fact, the risks are much the same as in the case of the employment of a contractor at daywork prices, except that the efficiency of labour rests more completely on the builder.

The first point which requires attention in the working of a schedule, as contrasted with that of a tender on quantities, is this:—

In a tender on quantities a contractor can arrange beforehand for his materials in the cheapest market and at the proper time for the conduct of the building, whereas in the case of a schedule he cannot make this calculation; his tender on a schedule is, therefore, likely to be higher than on quantities for the same work. There are, however, two ways by which this difference between the systems is occasionally reduced in execution. In the case of a contract it sometimes happens that an architect exercises the power of changing materials in the course of construction, and keeping parts of the building in abeyance to such an extent that a builder cannot take any advantage of the condition of the markets,—a point which is against the builder under a contract; and in some cases, where works are executed at a schedule, a fair idea may be obtained at first as to the extent and nature of materials required,—a point which is in favour of a builder under a schedule.

The next point of difference to be noticed is that of comparative closeness of measurement.

The accuracy of quantities depends on the time allowed for their preparation, and on the care exhibited in the drawings furnished. The custom of furnishing such details as may be relied upon by the surveyor for preparing really accurate quantities, and by the builder for the execution of the work, only survives in cases so few and exceptional that it may almost be left out of consideration. It is an article of faith that such a custom once existed.

Probably it will be near the mark to state that in very careful quantities, taken from general drawings only, there is an excess of one-half to one per cent. (and there ought not to be more), and that there are various labours taken which a builder tendering will consider either not imperative or included in the general description of the work, to the extent of possibly one per cent., but not exceeding that on the whole value of the work. These points are commonly discounted by the successful tenderer. In the case of measurement the excess may be considered as occurring at about the same extent, though it is likely to occur in different items from those which are likely to show excess in quantities; moreover, all labours and only those which are executed are paid for. These points are also discounted in the case of tenders on a schedule. The cost of measurement may be taken as one per cent. more than the cost of quantities, but the cost of measurement of variations is saved, so there is

very little actual difference in this respect to the employer.

There are two modes of pricing a schedule in use.—1. The presentation to the builders tendering of a blank schedule, comprising the principal items likely to be required, and the delivery by each of a priced copy, such competitive schedules requiring very careful comparison by means of a supposititious bill of quantities. 2. The presentation to the builders tendering of a schedule already priced out by a surveyor, and the delivery by each of a tender, at so much per cent. above or below the surveyor's prices, and, as variations of this arrangement, may be added the use of a published official or trade price-book.

The objection to the first is, that a large amount of special trouble is thrown on the builders tendering, who, to some extent, work in the dark, and the prices sent in are likely to vary very much in rate of profit in the several trades, and an endeavour is fostered on the part of the builder or employer to manipulate the work so as for one of them to gain an advantage over the other.

The production of an original suitable schedule, carefully priced out according to the exigencies of any special case by a surveyor, is a very difficult affair, and one seldom carried out. The second case commonly degenerates into the use of a recognised price-book or public schedule, to which objection may generally be taken, that the public schedule is inapplicable to the special circumstances, and is commonly of old date, and that the price-book is based on assumed prime costs, and its application implies a re-examination of all prime costs. In fact, there will generally be much guess-work, and therein an additional cost to those concerned, which, in a cutting business (such as building) will needs end in the employer suffering in some way.

Another point to be considered is that in building works, both contract and schedule, the circumstances of the case often vary so much from those contemplated by both parties at the commencement, that in fairness, for more or less of the work executed, the builder is entitled to be paid at different rates from those first contemplated; and these changes involve so much consideration that, on a reference, and occasionally as a mode of avoiding litigation, the actual prime cost to the builder has to be ascertained as a basis for the fair payment for the work. This brings us to

(B.) *An Agreement to allow the Builder a fixed Percentage on his Prime Cost.*—In this case it is recognised that the various risks are on the shoulders of the employer, but, instead of endeavouring to pass off many risks which he cannot control, and making his interest antagonistic to that of the builder, thus adding another to those he may have to fight in the course of his building operations, the employer faces the risk of an account prepared by the builder, with or without supervision, and trusts to obtaining in exchange the best efforts of the builder in economising time, in which the builder is especially interested, as well as in the economical use of materials and labour.

Such an agreement implies that the employer is one who erects buildings as a business, and that the builder is one who carries out buildings in a known and efficient manner. It applies that there is no intention on either side to best one another. It is, therefore, usually accompanied by mutual knowledge of the two parties.

In such cases the preliminary questions which always require special consideration and settlement beforehand include superintendence, and the use of plant and establishment charges. The terms of agreement usually involve the charging of certain items specifically, and the charge of a percentage made up of two items,—one for establishment charges, and one for profit.

It need hardly be said that these percentages must vary very much with the class of work required, and with the position and extent of work intended, and also with the position which the builder may hold in the class of tradesmen.

In the above notes it has been endeavoured to treat the subject from a surveyor's point of view. Let it not be supposed that it is wished to underrate the necessity for an architect. The business of the measuring-surveyor is a branch of architecture not conveniently carried on by the same person who is engaged in designing, and the opinion should be emphasised that one of the greatest risks which an employer ever

runs, and one which, if he does run, he may thank himself for, is that of endeavouring to carry out building operations without the assistance of an architect. One principal purpose of the employment of an architect is to see that a result is obtained commensurate with the means employed, but this result is not measured by cubic contents of building alone, but by convenience, suitability, and representative character, all of them other words for true economy. Under general circumstances, these requirements can only be obtained by the employment of an architect, who is responsible professionally for the result. He must be treated as an adviser and confidant, not as a servant or contractor.

Some of the difficulties have been mentioned which may be placed in the way of a contractor or of an employer from having an architect of insufficient experience, or of unwillingness to learn; but such faults are to be found both in builders and employers, and dealing with human nature involves risks overcome only by experience and by the habit of acquiring information.

CONTINENTAL NOTES.

IN a recent meeting of the Académie des Sciences Morales et Politiques, an interesting discussion was held on that burning question of modern existence, the dwellings of the poor, a discussion raised by the presentation by M. Picot of two pamphlets on the subject by Dr. Du Mesnil. M. Picot, after referring to the dreadful condition of the Paris poor, and the absolute need for steps being taken to remedy their deplorable existence, warmly advocated our English system of building societies, which, though not unknown in France, have met with none of that favour which is so marked a feature of their spread in this country. M. Léon Say drew the attention of his *confrères* to the necessity for the action of private initiative, which is encouraged by such societies, while at the same time advocating some appeal to the State. M. Leroy-Beaulieu, the eminent political economist, stated it as his belief that the increase of the population of Paris was not indefinite; the influx of recent years was largely due to unwholesome speculation. In such movements the State had small influence, and consequently any appeal to its active interference was unwise. The position in France was to some extent like that in England, and it had of late attracted no small attention on the part of the large land-owners. In referring to the building societies existing in Paris, M. Beaulieu not unjustly complained that they had so far only aided the class of smaller *employés* and *rentiers*, and it was necessary to touch a deeper stratum of the population. In the eminent economist's opinion the remedy lies in a series of reforms in what he terms "general hygiene." Private individuals must abstain from excessive building and the erection of too sumptuous dwellings; the State and municipality must lessen certain taxes, and not, as they too frequently do, relieve them in one quarter to increase them in another; all dues must be removed from building materials if cheap houses for the poor are to be provided; and, as a final source of relief, rent, he advises, should be made payable fortnightly, or even monthly. M. Passy very properly dwelt on the iniquity of demolishing whole neighbourhoods without supplying more adequate accommodation for those expropriated, and the discussion was closed after some interesting remarks from M. Jules Simon on the necessity for further action on the part of the public. Science had, so far, worked wonders in this direction of hygienic improvement; but an equally powerful factor for good was an improved tone of morality, which should go hand-in-hand with the advance of science.

It is interesting to compare with this discussion, in which most of the views of the case are approached, a letter by M. Laporte, published in the current number of the *Revue Occidentale*, and which, dealing with the efforts of those who, in Paris, are the advocates of the Haussmannian demolition of the old city, very justly urges some consideration being paid to branches of commerce which are in as suffering a condition as the building trade, and which are not, like it, so especially favoured by municipal legislation. M. Laporte, while temperate, expresses his sense of injustice at the partially shown to the building trade in Paris by the constant demolition of whole neighbourhoods

and their re-erection with a view to keeping the people employed. He not unfairly urges that it is the expenses entailed by this continued action of the municipality which raise the rates, and dispersing and ejecting the original occupants for more prosperous tenants, increase the cost of existence by the necessity for travel from considerable distances. The system, he further claims, offers a premium on unfair claims for compensation, and consequently increases the greed of the landlords who annually raise the rent.

LORD BRAMWELL ON MR. GEORGE.

IT may be doubted if Mr. George has not reached the acme of notoriety, and, like many agitators who have for a time obtained an undue amount of attention, he will probably soon cease, by the force of familiarity alone, even to attract. For the English people of to-day resemble the Athenians of old,—they are ever ready to throng to any place where a new doctrine in a striking form, or an old one in a new dress, is placed before them in an attractive shape. And there can be little doubt that much of Mr. George's celebrity, if it can be so called, arises not from the soundness of his doctrines, but because they are placed before the world in an attractive shape, with a great deal of force, and because they touch on subjects which are of interest to most Englishmen. When sensible people can in large numbers get excited about an elephant called Jumbo, and about another because he is piebald, it is wholly impossible that a social and economical phenomenon like Mr. George should not likewise have his day of attention. Mr. George's economical fallacies have already been destroyed by able men like Mr. Fawcett and Mr. Shaw-Lefevre, and now Lord Bramwell has joined in the fray. It may be said that if Mr. George writes and talks nonsense, why should eminent men waste their time in refuting his doctrines? But, unfortunately, a great many people do not think for themselves, and others are not very capable of clear and consecutive reasoning, and such are apt to be led away for a time by striking fallacies such as Mr. George enunciates. It is advisable, therefore, that he should be enabled to do as little harm as possible, and the best way in a country like ours to effect this object is for men with capacity and time to refute him with his own weapons of book and speech. Therefore, there can be no doubt that Lord Bramwell, by the publication of this pamphlet,* is doing good service to the community. To criticise what is in itself but a criticism of another work is a very unprofitable proceeding, and as Lord Bramwell's pamphlet may be purchased for the sum of twopenny, we shall leave criticism to those who may read it. But it may not be out of place to note some of the most trenchant passages in this publication.

Mr. George's great theory is that the land belongs to every inhabitant in the country; that separate property is not to be justified; and that every owner of the smallest parcel of ground should have his property taken from him, and that it should become the property of the State without the present owner receiving one farthing of compensation. The simple reason why this naked doctrine of pure robbery, and this doctrine of common property, which the experience of every civilised community and the common feelings of mankind show to be absurd, has had any attractiveness for the multitude, arises, no doubt, partly from the manner in which Mr. George appeals to the feelings of the people. It is very easy to stir up a kind of sympathy with the pauper, and to raise a cry against the rich man, by showing the misery of the one and the luxury of the other, and then to draw a false conclusion from unsound reasoning, which is overlooked in the wave of sympathy for the poor and the struggling which is produced by a little eloquent writing. But see the result of Mr. George's principles. "A man," says Lord Bramwell, "labours and sows, acquires a piece of land, perhaps taken in payment of a bad debt, dies with the comforting belief he has provided for his widow and orphans. Mr. George calls it 'justice' to confiscate it. Another man has been a member of a building society, and built his house, and believed it was his own; but Mr. George would charge him a heavy rent for the land on which it

* Nationalisation of Land: a Review of Mr. George's "Progress and Poverty." By Lord Bramwell, 19.4.

stands, because every patch of land has become of great value. No doubt, to confiscate land and raise the public revenue out of it would be a fine thing for all the community save the land-owners; but so would confiscating chattels be a fine thing for all but the chattel-owners, and the confiscation of labour would be a splendid thing for all but the labourer."

As regards the question of separate *versus* common property, Lord Bramwell puts the impracticability of a system of common property in a few clear words. "Is it not," he says, "absolutely certain that a man will do better with a piece of land, will get more out of it each year, if he has it for two years instead of one, for ten years instead of two, or for all time instead of ten? If the profit of his care and labour will be his at some time, will he not bestow them when otherwise he would not? It cannot be doubted. Tax him if you like, tax his rent, tax him *ad valorem*, but leave him enough to tempt him to improve. It is too plain; separate property in land, as in sheep and oxen, is for the good of the community; and if so, the quantity that one man may own can no more be limited than the quantity of sheep or oxen he may own, nor the use he shall make of it. Have an agrarian law; give each man his share. In ten years the careful, skilful, and provident allottees would be the owners of the share of the careless, unskilful, and improvident, and it is for the general good it should be so." In fact, it is obvious that Mr. George's proposal as regards land is absolutely opposed to all the doctrines which time has shown to be the soundest. The aim of the men of the great French revolution was to enable as many of the community as possible to become the owners of the land, and to destroy the power of the great nobles; but Mr. George would confiscate the plot of the peasant proprietor as much as the park of the peer; he would at one blow put an end to one great incentive to thrift, and to one of the greatest bulwarks of freedom and progress. So retrograde, so absurd a proposal has only to be shown in its true colours to produce its own refutation.

"MEN OF THE TIME."* AN ARCHITECTURAL SURVEY.

THAT the compiler or editor of a biographical dictionary has no very easy task in choosing the names of the persons, whether contemporaries of his own or not, who are to be included in it, will be readily conceded. The difficulty is all the greater because there is no possible test which can be regarded as satisfactory or final. The editor is, in fact, solely responsible: by his competency or incompetency the success of the enterprise must stand or fall. From him there is no appeal.

Of course there are some names which everybody will look for here, with a certainty of finding them. Not to include the great names, which are in every one's mouth, would be indeed too scandalous. But we want more than that in a dictionary of Men of the Time. Every man engaged in a liberal profession has a right to expect to find the leaders of it recorded here, with some particulars of their lives and careers; he expects also, and with reason, to find the professors of the art or science which he practises, with the presidents and leading officials of the institutions established for their study, or to protect their interests. He will look for those who have achieved the honours, whether complimentary or official, that their brethren or the Crown have to bestow. Besides these there will always be a certain number of men in every department of human endeavour, in whose cases public recognition, such as we have ventured to specify, has either been declined or delayed, but whose general, social, or professional repute would seem to justify their insertion.

These are some of the tests to which we have subjected the volume before us,—as regards, that is, the professions and occupations with which the readers of this journal are for the most part familiar. We may state at once that a somewhat careful examination discloses the fact that only the thirteen architects, whose names follow, are considered by Mr. T. Cooper, F.S.A., to be worthy of such distinction as it is in his power to confer:—Professor Donaldson (*clarum et venerabile nomen*), Mr. G. Godwin, Mr. Fergusson, Mr. J. H. Parker, Sir J. A.

* Men of the Time. Eleventh edition. London: G. Routledge & Sons, 1884.

Picton, Mr. Waterhouse, Mr. Butterfield, Mr. William Dawes, Mr. C. F. Hayward, Mr. James Knowles, Mr. Norman Shaw, Mr. Aitchison, and Mr. Thomas Henry Watson. There are two foreign architects only; these are MM. Garnier and Questel. It may be seen at a glance how absurdly capricious and inadequate is such a presentation of what our editor denominates the "Aristocracy of Intellect," as regards the architectural profession. Even of the names above given, some are those of gentlemen whose principal claim to distinction is, undoubtedly, literary. But we proceed to apply the imperfect tests we have suggested, and the matter becomes more remarkable. Of the Presidents of the Royal Institute of British Architects, we miss the names of the present President, Mr. Horace Jones, who is also the City Architect, Mr. Charles Barry, and Mr. Whichcote. Of the architectural members of the Royal Academy we find, as we said, Mr. Shaw and Mr. Aitchison, whilst Mr. J. L. Pearson and Mr. Bodley are unaccountably omitted. Of the occupants of professorial chairs, we miss the names both of Mr. Kerr (of King's College) and Mr. Roger Smith (of University College), as well as Professor (*emeritus*) Hayter Lewis. Passing to those who hold important architectural appointments, we fail to find Mr. Penrose, of St. Paul's Cathedral; Mr. Robson, of the London School Board (or Mr. J. J. Stevenson); Mr. Blomfield, of the New Law Courts; Mr. Christian, of the Ecclesiastical Commission; or Mr. Eastlake, of the National Gallery. Besides these, for certain special reasons which should be well known to an editor of a work of this class, we ought at any rate to meet with the names of Mr. C. J. Phipps, architect of half of the London theatres; Col. Edis, of the Artists' Volunteer Corps; and Mr. J. P. Seddon.

There is another class of men we ought to find well represented here. A contemporary has complained of the absence of several of the great engineers,—of Bramwell, Cooke, Abernethy, Brunel, Hawksley, and Bateman. These are notable omissions. But we claim that the men who have designed, constructed, or carried out great works of public utility, and the leaders of industrial enterprise, ought to appear; but we cannot find the names of Sir George Elliot, Sir John Kolk, or Sir Charles Freaux. We have Sir E. Watkin, but not Colonel Beaumont; we have Sir D. Gooch, but not Mr. J. Staats Forbes. Nor have we men like Mr. J. W. Swan, or Mr. St. G. Lane Fox, the electricians.

It seems to us, therefore, that tried by the simplest tests that occur to us, this volume is extremely unsatisfactory. From a cursory inspection of it, beyond the purely professional boundaries we have assigned to ourselves, we firmly believe that numbers of other professions, political, literary, artistic, and what not, might form an indictment equally fatal to its being considered, in any sense, to have approached even its own ideal of what it should be, extremely moderate and inadequate as that ideal appears to us to be.

Parquet Flooring.—We have received from Messrs. Howard & Sons a specimen design for parquet flooring put together on a process patented by Mr. G. Howard, and exhibiting a flowing design in Renaissance character carried from square to square over the joints of the parquetry. Apparently the suggestion is for a freer treatment of parquet flooring design in place of the geometric treatment of such work which is most generally adopted. If the process of cutting and fitting by Messrs. Howard gives greater facilities for this freedom of treatment, architects may be glad to know of it in order to introduce greater variety of treatment into their designs. At the same time, we are disposed to say that, considering that in wood flooring we are dealing with a material of fibrous character and strongly-marked grain, a geometric treatment by fitting the pieces is more suitable than a style of design which involves cutting across the grain. In marble inlay one can suitably work the lines of the design in any direction, and in curved or straight lines, with equal appropriateness; but in wood inlay it seems desirable to adopt a more formal and geometrical character, both on artistic grounds and in consideration of the probable greater durability of work in which cross-cutting and oblique cutting, in respect of the grain, can be avoided.

THE BEWICK MANIA.

Catalogue of the Bewick Collection, Newcastle, 1884.

MANY lovers of Bewick and many speculators in his work, will be jostling one another for seats in the night mall on Sunday, the 3rd inst. On Monday the 4th, the collection is on view at Newcastle. On the three following days it is to be sold.

The "executors of Miss Bewick, deceased," have made the most of their opportunity. Their catalogue cost us a shilling. The sum, had we saved it, and bided our time, would have secured, we cannot doubt, several "lots" of this promiscuous collection. Honestly, Mr. Robert Robinson, it was not worth it. It is "embellished," it is true, with some heretofore unpublished cuts, but these are not interesting on the whole. They are badly printed on very unsuitable paper.

The property is comprised in 645 lots. If any have raised their expectations very high, it will be well for them to know that the larger part of these relics look (on paper) dismally uninteresting. We yield to none in loving reverence for the father of English wood-engraving, yet we confess at once that we should never go to Newcastle to compete for the possession of Lot 62, consisting of a copy of Mavor's Spelling Book, "the gift of T. Bewick to Elizabeth Bewick," and another book. Neither do we feel any restless craving for that walking-stick (No. 445) one while in the possession of John Bewick. The stick, it is said, conceals in its vitals a "haughty," and into "this deeply interesting memento" the "talented young artist" would pour his soul and make night hideous in the neighbourhood of Hornsea, and along the exuvial reaches of the lower Thames. There is yet another stick (No. 446) with the initials D.S. We cannot think that this would be a quite irreproachable keepsake to have of its quondam proprietor *de facto*—our unique T.B. Yet this precious staff stands high on the list of the personal relics.

There is a large silk umbrella "inscribed T. Bewick." We should like that. Woodcuts were woodcuts, and silk was silk, in the good old times of its sturdy possessor.

To the things we have mentioned the executors of Miss Bewick would attach a quite special interest. The greater part of the catalogue is occupied with matters of less than common interest. There are one or two old pictures, it seems, of which the compiler speaks in that loose, elusive, and yet suggestive manner, which is proper to so reconceivable a subject. Lot 257—David Teniers—"The Toper"—"painted with that ease and spirit for which the great master of the Flemish School was so remarkable." That adventurous "so remarkable" reminds us of a pænygenic upon Sir Joshua Reynolds by a late Mayor of Plymouth. "His works, I am told, wherever exhibited, give great satisfaction!" No. 335, Rembrandt—two fine etched portraits by this great master—scarce. There is a careless generality about this description, which is likely to appeal to the humorous part of any collector of etchings. Again, there are etchings for sale of a certain Count Bol, of whom we "desire more acquaintance."

We come now to the really interesting matter. There seems much, yet there is not so much after all. One result of the sale will be that a great number of imperfect copies of the "Birds" (chiefly of the 1847 edition), will be in the market. *Caveat emptor*. Two hundred and ninety-three copies of that scarce, delightful book, "The memoir of Thomas Bewick," are to be sold. Many who have been hunting it in vain will now obtain a copy. For all amateurs of wood-engraving there is a great deal of interesting stuff, but of really good editions there is a remarkable lack. An imperfect copy of the "Select Fables," 1784, is the only important book that appears in its first edition. There are parcels and parcels of "waste sheets" and numberless "imperfect copies." These, being clean, are very desirable. The fact, however, that so many of them are to be thrown upon the world is a circumstance of danger to the young collector, of which we would warn him in time.

In our judgment, it would have been better to have brought up to town (with the blocks which Christie & Manson will sell) all that is of genuine artistic value, and to have left the mass of household utensils, "fancy bellows," painted "towel-racks," and the rest, a prey to the Tyneside furniture-brokers.

LYCIAN ROCK TOMBS.

This was the subject of Professor Newton's fourth lecture of the present course,* delivered on the 25th ult. He observed that the rock-tombs of which he had to speak in the present lecture were very much later than the Harpy Tomb, and might be divided into three classes. First of all there were many tombs which were merely façades cut in the side of the rock or mountain, and which presented the appearance of small distyle Greek temples. Next, there was a class of tombs which, standing quite free on all sides, had been called, by German writers on architecture, *block-haus* tombs. These were provided with openings corresponding somewhat to windows with square mullions, and from this circumstance Sir Charles Fellows had spoken of them as "Elizabethan" in character. A painting [exhibited] by Mr. George Scharf, who accompanied Sir Charles Fellows, showed the sides of a rock, overlooking the City of Myra, studded with Ionic façades, and the same thing was to be seen in the neighbourhood of other cities in Lycia. The detached tombs were generally in the most picturesque situations, generally with magnificent backgrounds of mountains, and every sort of verdure. These, combined with the blue sky and sea, went to make these monuments exceedingly picturesque. The best idea of their appearance, short of an actual visit to Lycia, was to be obtained by an examination of those magnificent drawings of Lycia which some years ago Mr. Henderson bequeathed to the British Museum. Formerly exhibited in the King's Library, these drawings, which were by Müller, were now in the Print-room. There was another set of drawings of Lycian monuments in the Print-room, viz., those by Daniel, the ill-fated companion of Spratt and Forbes. There were also in the Print-room several interesting architectural drawings and a plan of the city of Xanthos, and drawings of several monuments. These drawings were made by Mr. George Scharf for the Trustees of the British Museum for a publication which the lecturer regretted to say, had never seen the light. Some day it might be possible, by the aid of some of the combinations of photography and lithography, to publish the book. He proposed to confine his remarks in the present lecture to the detached tombs from Lycia which were to be seen in the British Museum. He could not but feel considerable regret at the very inadequate manner in which they were housed, ever since they were brought over to this country in about the year 1843. He did not know that any one in particular was to be blamed for this. His predecessor, Mr. Hawkins, when these Lycian marbles were brought over, specified with great care the sort of room he should like to put them in, but the room assigned to them was very much smaller than they required. The tombs now stood very much lower than they originally did, for if a portion of their plinths had not been removed their tops would have gone through the ceiling. Notwithstanding this the sculptures were so high as to be inaccessible for study (except on one side) without the use of ladders. He grieved to say that any one who wanted really to study the sculptures on the top of this tomb must go to Berlin, where, in the Museum of Casts, were to be seen casts of the upper part of this important monument. What was more, the authorities of the Berlin Museum had had painted on the walls of the room where the casts were exhibited views of this and other tombs in Lycia, with representations of the natural scenery amidst which they were found. What we generally did in England in these matters was certainly an illustration of "how not to do it." The meagreness and scantiness of the space which had been allotted not only to these monuments but to many other important works contrasted very unfavourably with what was doing abroad, and that not only in rich countries, but in poor ones. While the French had built a great courtyard and roofed it over for the adequate display of the great "Victory" from Samothrace; while the Germans were resolved to display the wonderful series of friezes from Pergamos to the best advantage, even by rebuilding to its absolute full size the original enormous altar which the sculptures adorned; while the Austrians were taking special means, in the Museum of Ancient Sculpture which they were now building, to give adequate exhibitions to

the great frieze, 300 ft. long, from that interesting place Djölbaschi; we should most likely have relegated the valuable marbles to a shed under the colonnade of the British Museum for twenty years. Proceeding to speak of the *block-haus* tombs, with their pointed roofs, the lecturer pointed out by means of models and drawings how they, although of stone, had unmistakably derived their forms from wooden construction. Semper, in referring to textile fabrics, expressed incidentally his opinion that the upper part of such a tomb as the one now under notice represented a sort of catafalque over a funeral bier. Kugler, in his "Handbook of Architecture," made some very good remarks upon this tomb, particularly with regard to its derivation from a wooden structure. On this head the lecturer said he had received some very interesting remarks from Mr. Hayter Lewis, Emeritus Professor of Architecture in University College, who wrote:—

"The Lycian detached tombs, with circular copped tops, are so peculiar that they require a study to themselves. They are not directly derived, so far as I can see, from any more ancient works, nor do they appear to have influenced any beyond their own neighbourhood. . . . Their design seems to be quite different in principle from that of the other tombs, though all are derived from wooden originals. But all others appear to be so from actual buildings, whereas these Lycian detached tombs give one the idea of great wooden movable originals, the massive stone beams at the base, with their curled ends, being representative of solid wooden supports to the whole structure above. This would rather favour Professor Semper's idea. I do not, however, call to mind any forms of tombs in other styles which could supply the origin of the pointed-arch tops, unless it be the Lycian one figured in 'Asia Minor'; but this is clearly stone. Of course, we have the rounded tops to the wooden coffins of Egypt, and it is possible that these may have been imitated in Assyria and Persia, and so given the type; though in these less arid countries the wood may have perished. If so, it is very possible that the pointed arch may have been used, as it certainly was known to the Assyrians, and Victor Place considers that the remains of Khorsabad prove it to have covered the hall there. Flandrin and Coste consider it, in fact, to have been the ordinary roofing of the Assyrian halls, and it is still so used at Mosul. So it is, also, in Upper Egypt, though I have never seen it so described. In the Lycian tombs I notice that there are the ends of wooden rafters carved under the curved roofs, and these may, possibly, represent supports on which the sun-dried bricks were placed (in two rings), and plastered over to keep out the wet."

The learned lecturer, in conclusion, proceeded to describe the sculptures on the smaller detached tomb in the British Museum, and to refer to the inscriptions, which were in the Lycian language, of which our present knowledge was very limited and uncertain. According, however, to the translations of the inscriptions by Savelberg,* the monument was erected by one Paiafa, who was recorded to have commenced the tomb in his youth. Another translation, by Herr Moritz Schmidt, gave a somewhat different rendering of the inscriptions, and Schmidt's translation was regarded by Michaelis as being the more reliable and exact of the two. As to the probable date of this class of monument, he (Professor Newton) had never changed his opinion that they are not earlier than the middle of the fourth century B.C., and very possibly some of them may even be so late as the beginning of the third century B.C. It was probable that the form of these monuments had been due to Persian influence.

Professor Newton will continue the subject in his next lecture, which will be delivered this Friday, Feb. 1.

Liverpool Engineering Society.—The first meeting of the session was held on Wednesday evening, January 16th, at the Royal Institution,—the vice-president, Mr. J. S. Brodie, M. Inst. M.E., in the chair,—when a paper entitled "The Application of Compressed Air to Mining," was read by Mr. M. G. Johnson. The author commenced by pointing out how necessary to the mining engineer was the transmission of power, and enumerated the various methods, namely, steam, water, wire-ropes, compressed air, and electricity, explaining the various properties of each as available for underground working, and pointing out that, with compressed air, there was a large power available at any part of the mine for working machinery and also for ventilating purposes.

* "Beiträge zur Entzifferung der Lykischen Sprachdenkmäler." Von J. Savelberg. (Bonn, 1878.)

CHEAPSIDE IN THE REIGN OF HENRY VIII.

It would be quite impossible for us at the present day to realise what "old Cheapside" was like, were it not for the few contemporary engravings which represent portions of it, and the very detailed description given by Stow; but even these are only intelligible to those who have made the ancient architecture of the metropolis a careful study, and who are thoroughly conversant with the singular way in which draughtsmen of the sixteenth and seventeenth centuries represented, or, rather, misrepresented, objects. Even Hollar seems to have been quite incapable of accuracy in his delineations of buildings. His plan of Old St. Paul's, for instance, disagrees with the elevations. His elevations disagree with one another, and his descriptions are, again, at total variance with both plan and elevations. Hollar, however, is accuracy itself compared with any other draughtsman of his time. It is only by comparing drawings together, by making allowances for the various discrepancies, by a very careful study of existing ancient buildings in the metropolis, by noticing how far old engravings represent or misrepresent them, that we can arrive at anything like a just notion of their value in representing buildings now destroyed, or tell how to use them in imaginary restorations of ancient buildings or cities. Judging from the various maps, bird's-eye views, &c., which exist, it appears that old Cheapside followed pretty much the same lines that the present street does, and it appears to have been of about the same width. Towards the west, however, it widened out, and the centre of the road was occupied by a church dedicated to St. Michael. This church is called variously St. Michael ad Bladum, St. Michael le Quern, and St. Michael Paternoster.* The two former appellations have reference to its being situated on the site of an ancient corn-market, and the latter to its proximity to Paternoster-row. It was evidently at the time of its destruction by "the Fire of London" a plain, perpendicular building, consisting simply of a nave and tower at the west end; to the east of this church, and standing in the middle of the road, was a square building, with octagonal pinnacles at the angles; this was one of the city conduits, and was known as the little, or "lesser," conduit in Cheap. It appears, as far as one can make out, to have been about the same date as the church.

To the south of the Church of St. Michael, and on the opposite side of the street, stood one of the gateways leading into the greater cemetery, or churchyard, of Old St. Paul's, and near to it was an isolated tower of thirteenth-century work, crowned by a lofty wooden spire, on the top of which, in Henry VIII.'s time, was a gilded statue of St. Paul, and in the tower were hung four bells, called "Jesus bells," because, as Dugdale says, "they belonged to Jesus Chapel, situated in the eastern portion of the crypt, under Old St. Paul's." That enlightened monarch, Henry VIII., lost both the bells and the statue at one throw of the dice, to Sir Miles Partridge. It is consoling to learn that this same Sir Miles Partridge was beheaded in Edward VI.'s time. The famous preaching-cross, known as St. Paul's Cross, stood between this tower and the cathedral. Several other buildings of importance stood to the north of the cathedral; amongst others was a beautiful chapel known as Pardon Church Haugh. This chapel was founded by Gilbert à Becket, father of Thomas à Becket; it was rebuilt in Henry V.'s time. It was surrounded by a great cloister, probably forming the great cloisters of the cathedral; both were full of magnificent monuments, so much so that Stow says "that curious workmanship they passed all others that were in the cathedral itself;" moreover, its walls were adorned by a series of pictures representing the Dance of Death, which were executed at the charge of Jenkin Carpenter, one of the executors to Sir Richard Whittington, who also employed John Lydgate to write an English translation of the inscription attached to similar paintings in the cloisters of the Innocents at Paris. This cloister was probably a kind of "Campo Santo" to the cathedral; both chapel and cloister, however, were pulled down by Protector Somerset. The stones were carted off to help in the erection of Somerset

* It must not be confounded with St. Michael, Paternoster Royal.

* See *Builder*, pp. 92, 142, ante.

† Now the Archieb. Room.

House, and the bones of the dead were used to form a mound at Finsbury, which, when covered with road dirt and other rubbish, formed a convenient groundwork whereon to erect a windmill. The bishop's palace stood to the west of these cloisters, and to the north was the Charnel Chapel. Over the eastern walk of the cloisters was a magnificent library. All these buildings, except the bishop's palace, shared the fate of the cloister. Of the vast cathedral itself it is not our intention to speak, except to mention the fact that the great spire, of wood covered with lead, was destroyed by lightning in the year 1561, and never afterwards rebuilt. It had previously been restored in Queen Mary's reign.

Returning to Cheapside. On the north, at the corner of Wood-street, stood the Church of St. Peter, in Cheap; judging from the ancient drawings, it would appear to have been a Perpendicular building of moderate dimensions, consisting of a nave and aisles, with a fairly lofty western tower, crowned with a small domical turret of wood. In the centre of the road, nearly opposite to the south-east angle of this church, stood the high Cross of Cheap; it was one of the Eleanor Crosses erected by Edward I., and appears to have been a remarkably beautiful structure; it was, however, restored in Henry VII.'s time, and again in the time of Elizabeth, after it had been almost destroyed by an outbreak of Puritan fanaticism. The quantity of abuse levelled at this beautiful monument of the Middle Ages by Puritan preachers and poets would fill a whole library, but the choiceness of the language might deter respectable readers from perusing this highly-respected theological literature. Between Bread-street and Bow Church stood Goldenmilt's-row: this consisted of a series of houses and shops, which, according to Stow, were four stories high, framed in timber, and presented a façade of ten gables all alike towards Cheapside. They were erected by Thomas Wood, goldsmith and sheriff of London in 1491; and were adorned with carvings of woodmen riding upon monstrous beasts, coats-of-arms, and other ornaments; they appear to have been amongst the most elaborate examples of domestic architecture in the metropolis. Opposite the western portion of this row in the middle of the street, was an octagonal tower, crowned by a projecting parapet and open lantern of stone, the lower portion of which formed a fountain; this building was called the "Standard," in Cheap. A little further east, in front of Bow Church, which it blocked out from the street, was a costly building of stone, with an open arcade in its upper story looking towards the street; this was called the "Crown Sild," or "Sildam." It appears to have been rebuilt about the year 1410; from this building the kings and royal visitors to London used to watch the pageants and processions at Cheapside. Some portions of the remains of this building were discovered in 1845, and were described in the *Builder*. Immediately to the rear of the Crown Sild stood Bow Church. Its tower was of somewhat remarkable design, recalling to one's mind St. Nicholas Newcastle and St. Giles's, Edinburgh; it had, however, this difference—Bow Church possessed five open lanterns. Fortunately a tolerably correct representation of this remarkable building is preserved in the seal of Bow Church dated 1650; the tower itself was completed in the reign of Edward III., but the arched top and five lanterns appear to have been either added or rebuilt in the year 1512. It has sometimes been supposed that the term Bow Church, or *Ecclesia beatorum Marie de arcibus*, received its name from this arched top to the tower, but in all probability the title is of a much older standing. The tower of Bow Church appears to have possessed a clock from early times; one of the clock-faces is shown in the seal of the church. Nearly opposite to Bow Church a somewhat remarkable-looking house is shown in the old views; it has a great hipped roof and two projecting turrets or oriels at the angles. We have been unable to ascertain what the building exactly was, it may have been a great inn or hostelry. From the fact that the two great turrets, or oriels, project forward as they increase in height; it seems pretty evident that the building was of timber.

We need scarcely say that not a single ancient building in Cheapside escaped the fire of 1666, which raged here in greater fury than in any other part of London; it was certainly the most magnificent street in the metropolis, and has been not inaptly compared to the

Maximilian Strasse at Augsburg, of which we gave a view some little time back.*

H. W. B.

THE NEW CIRCULAR WARD AT THE HAMPSTEAD INFIRMARY.

It has fallen to the Guardians of the Parish of St. John, Hampstead, to have the distinction of being the first parochial authority in Great Britain to put into practical form that which has been for so long talked of and written about, viz., a circular ward for infirm purposes, which we this week illustrate by a general ground-plan, and elevations and sections, from the architect's working drawings.

An extension of the Workhouse Infirmary having become a necessity, the question to be solved was how it should be done, having regard to the restricted size and position of the available land, and the convenient position of the new ward in relation to the existing Workhouse and Infirmary. The Workhouse is one of the old-fashioned ones, erected in 1845, and added to at various times, the latest being in 1870, when two oblong infirm wards for 100 beds were erected running out at right angles to the main building, but not connected with it excepting by covered corridors. The varying levels of the floors of the main building rendered this by no means an easy operation.

The site available for the new extension consisted of a piece of ground on the west side of the existing wards,—about 110 ft. by 150 ft.,—with a frontage to the street, but surrounded on the other sides by houses, the gardens of which abutted on the site; and there is also a rapid fall in the ground from north to south of about 30 ft.

The first proposal was to build an oblong ward of three floors parallel to the existing ones, and separated from them by as wide a space as possible; and another suggestion was to place it at right-angles to the old wards, due east and west. Both these proposals were found to have serious disadvantages. The first would affect the light and air to the adjoining properties, and the second did the same to the existing wards; and both made the arrangements for the connexion with the administrative department which it was necessary to retain in the Workhouse block, of a difficult and complicated nature. The late Dr. Cook, the able medical officer to the Infirmary, was a man who took a deep and practical interest in the subject, and to him belongs the credit of first suggesting the idea of erecting a circular ward. It was readily taken up by the architect to the Guardians, and, after a long and exhaustive series of arbitrations and conferences with the officials of the Poor Law Board, in which the hearty sympathy and valuable suggestions of their architect, Mr. Percival Gordon Smith (whose pamphlet on the circular-ward system is well known), were enlisted, the consent of the Board was given to the ward as illustrated. A separate and distinct Infirmary entrance for patients is provided, for the old part as well as the new, from New End, with receiving-room, giving access, by a covered corridor, to the several wards. The levels are so arranged that the old and new wards are all on the same level. Above the receiving-room is the matron's sitting-room, with nurses' mess-room over. The circular ward contains seventy-two beds in three floors, of twenty-four in each. The ground floor is over a basement, used for heating and ventilating purposes, and to ensure perfect dryness to the wards. The diameter of the ward is 50 ft., and the heights of the floors are 13 ft. and 12 ft., agreeing with those in the old building. It was found that any increase of this diameter greatly added to the expense without proportionately increasing the number of beds. A south-west aspect is obtained for one half of the ward, and a free circulation of air is maintained all round, whilst the rights of light and air to adjoining owners are unaffected. The central shaft, whilst necessary for the construction of the building, is also the medium for dealing with the ventilation,—a matter of some concern to the advocates of the circular system. The shaft is 5 ft. internal diameter, and is divided by sheet iron into four divisions, one for the extraction of vitiated air from each of the three wards, and the fourth (one-half of the whole

area of the shaft) forms an upcast to discharge the whole to the outer air. A furnace, with coil of hot-water pipes, exhausts the air from the wards through openings in the shaft, to the bottom of it, and the air is thence dispersed by the upcast. The fresh air is supplied from gratings under the sills of the ward windows, and passes over a coil of pipes placed in each of the window backs, and protected by a slab of slate, the heated air being liberated up the cylinder through a grating.

By this system a constant stream of pure air is supplied at the rate of 2,200 ft. per hour per patient. In winter the temperature will be at 65 degrees when it is freezing outside, and in summer the hot coils in the basement will always maintain a current of air through the ward. All the windows have hopper heads to open. There are also small wards for two beds each on each floor at the entrance to the large ward, with nurses' store and dust-shoot adjoining; and on the opposite side of the passage is a ward scullery and staircase. The water-closets and lavatories, &c., are all contained in a projecting block from the ward, with disconnecting passage, having a through ventilation. Each floor has a bath-room, water-closet, urinal, and broom-closet. From the short passage, access is had from each ward to a wide balcony, forming a pleasant promenade for patients on the south side.

On the top of the lavatory block a large tank to hold 12,000 gallons of water is placed, to supply the whole of the workhouse in addition to the new ward, and also for working the hydraulic lift at the entrance. This is not only for patient use, but specially serves to convey all the meals to both the new and old wards, from the new kitchen, which is built above the existing block of buildings facing New End, comprising kitchen, scullery, larders, &c. The meals also for the workhouse inmates will be cooked here, and by means of a hand-power lift will be delivered into a serving-room below, adjacent to the workhouse corridor.

The whole of the new wards will have chocolate glazed bricks as a dado 4 ft. high inside, and fair joint brickwork coloured above. All the walls will be of white Suffolk bricks, relieved by Luton brick bands and arches. The attic storey of the new ward is devoted to nurses' bedrooms, with bath, &c., for their use.

The floors of the ward are supported by iron joists radiating from the centre shaft, which is encircled by iron columns and spandrel pieces embracing the whole.

The works are in active progress, and it is fully hoped to have this unique and interesting experiment in hospital construction in working order during the present year.

The architect is Mr. Charles Bell, and the general contractor Mr. Oliver T. Gibbons, of Ipswich, and the clerk of works Mr. G. Berry. The hydraulic and other life are by Messrs. Waygood & Co., of Great Dover-street, South-west. The ironwork is being supplied by Messrs. Williams & Co., and the warming and ventilating is by Messrs. Bacon & Co., of London.

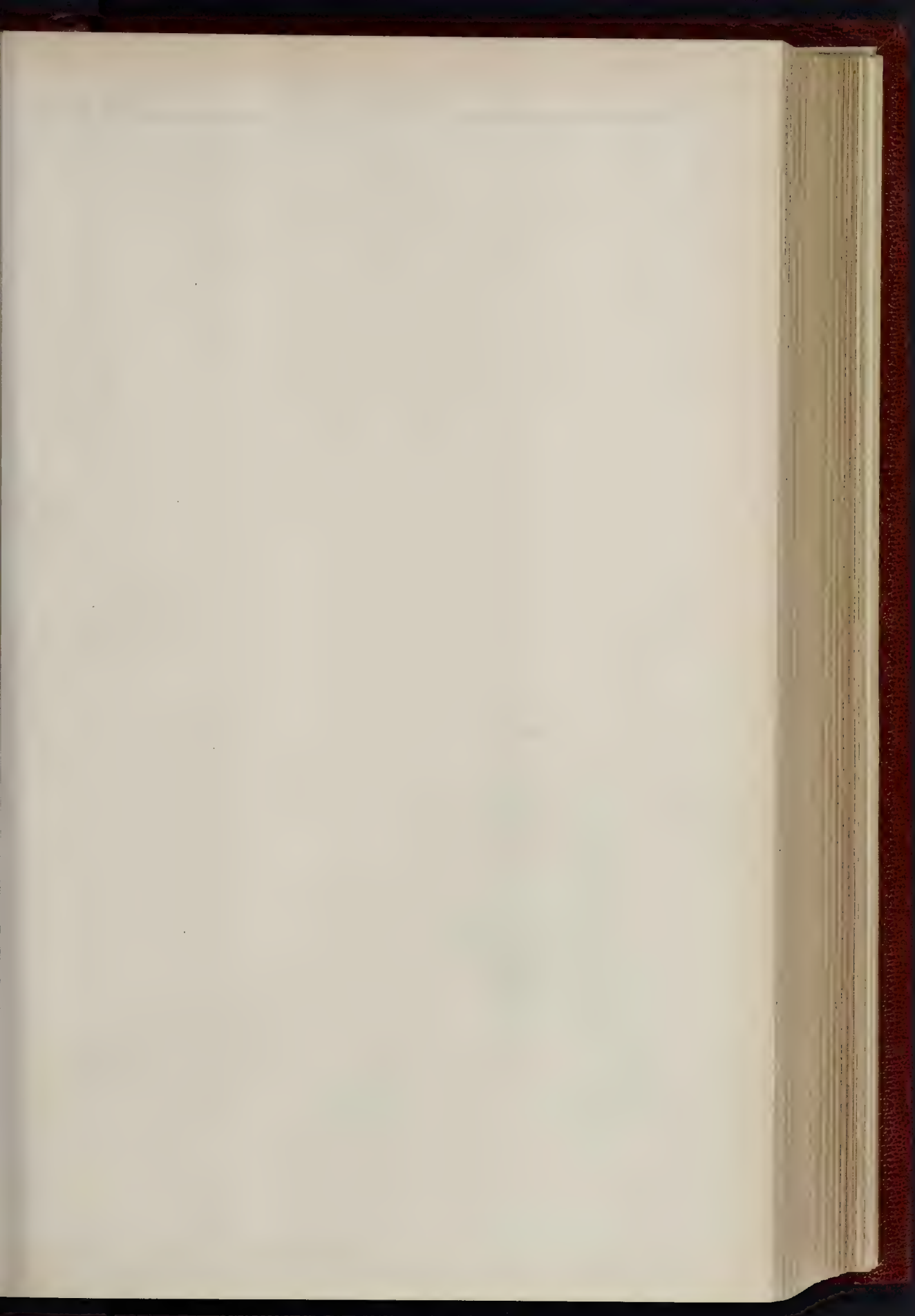
The total cost, including corridors, kitchen block, warming and ventilating, is 10,400*l.*, a price which will compare favourably with the cost of some recent new Metropolitan infirmaries.

INDEPENDENT CHURCH, LOWER EDMONTON.

We this week illustrate Messrs. Borer & Dobbs's design for the Independent Church, Lower Edmonton, which was selected in a limited competition. The building consists of church, 92 ft. by 48 ft., and will accommodate 1,000 persons. There are two entrances, with vestibules, chancel, organ-chamber, two vestries, and three committee and class rooms. The exterior of the building is faced with Kentish rag and Bath stone dressings; the spire is 142 ft. high. Mr. Sharman, builder, is carrying out the works, his estimate for the entire building being 7,060*l.* The east end, or school portion, is now finished, and has been opened as a temporary church.

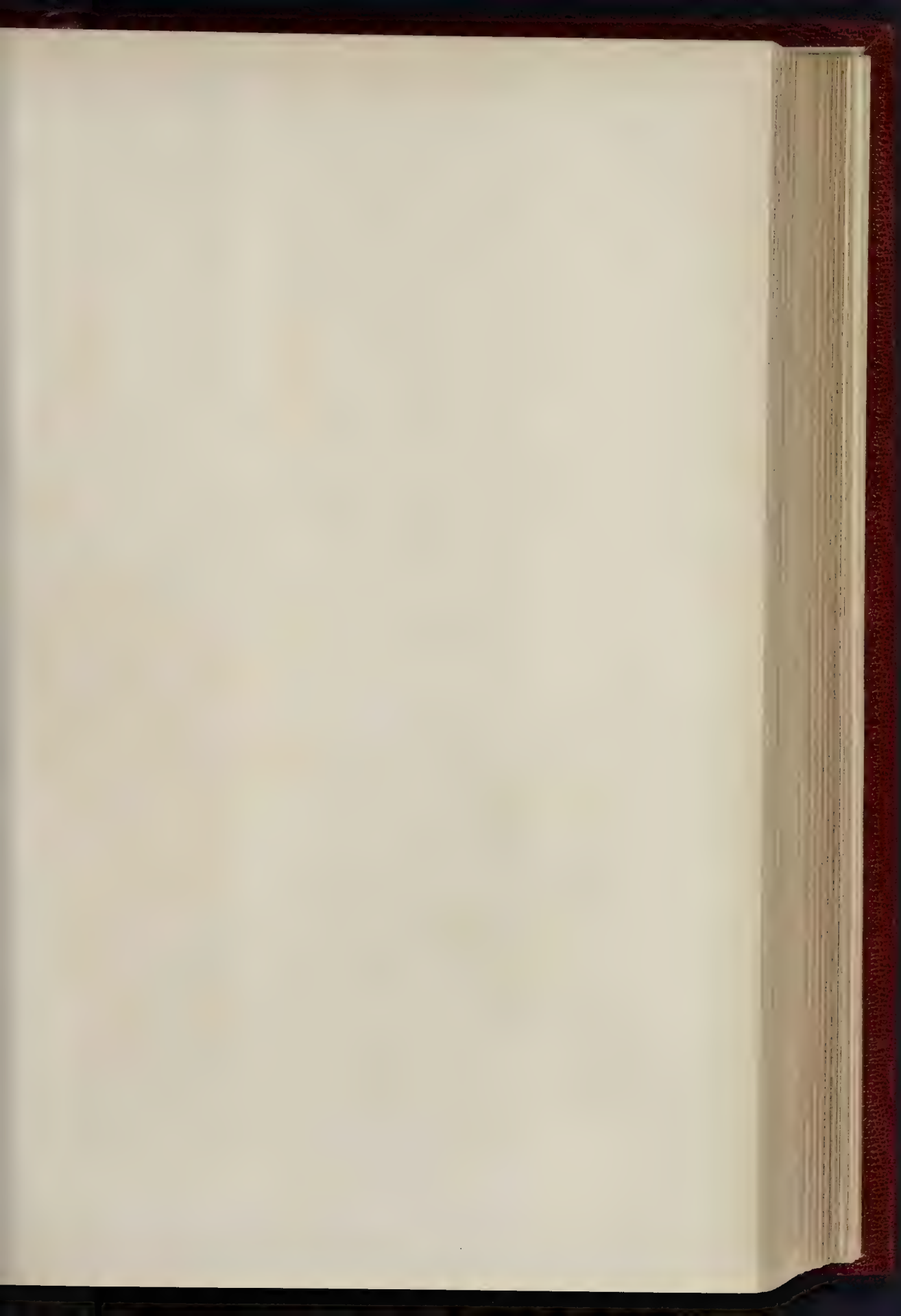
Ventilation.—Messrs. Robert Boyle & Son, of London and Glasgow, have recently applied their system of ventilation to the new Prince's Theatre, Coventry-street, and to several club-houses, barracks, and prisons.

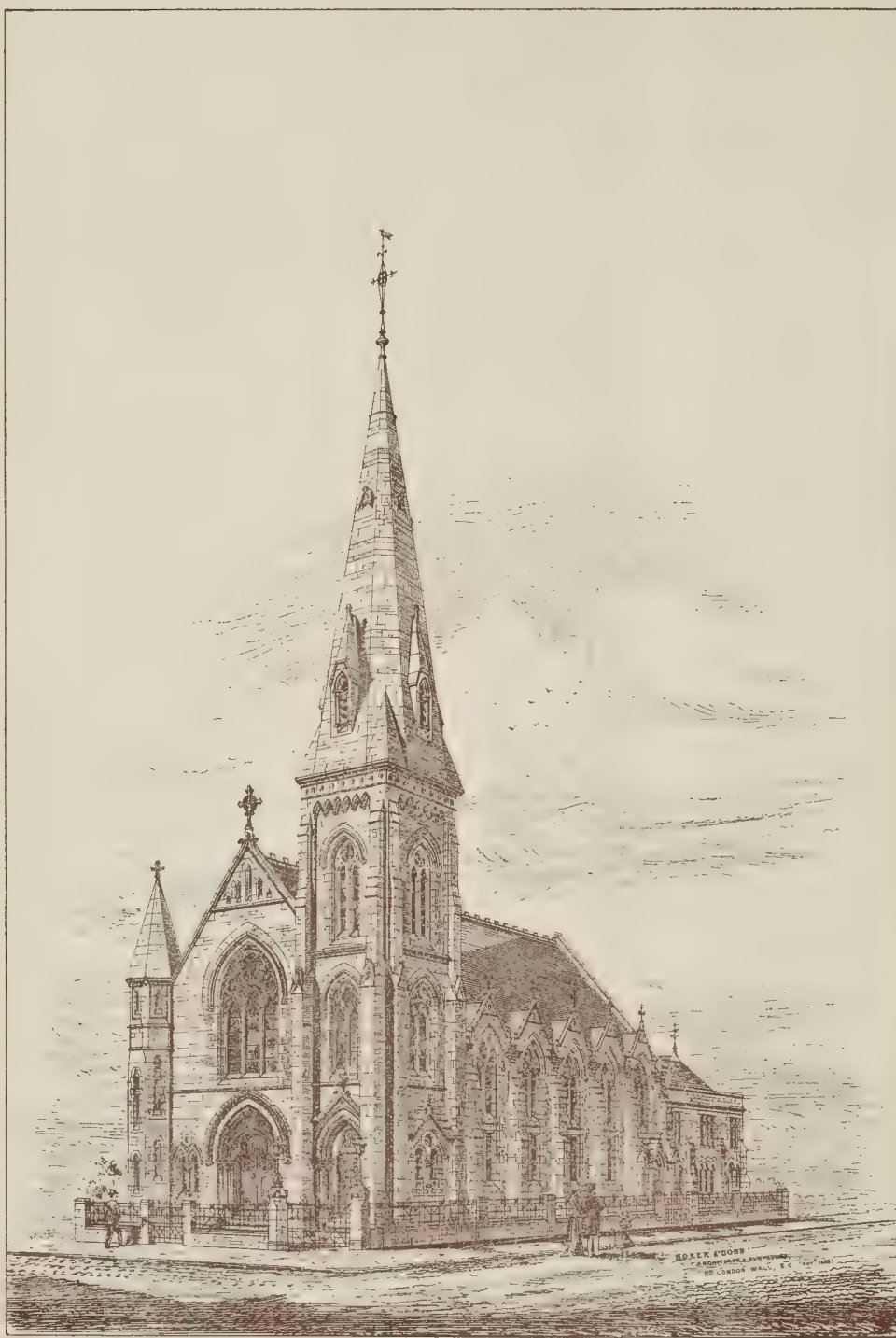
* *Builder*, Sept. 29, 1883.





VIEW IN THE CALLE DEL MERCADO, LOGROÑO, SPAIN.

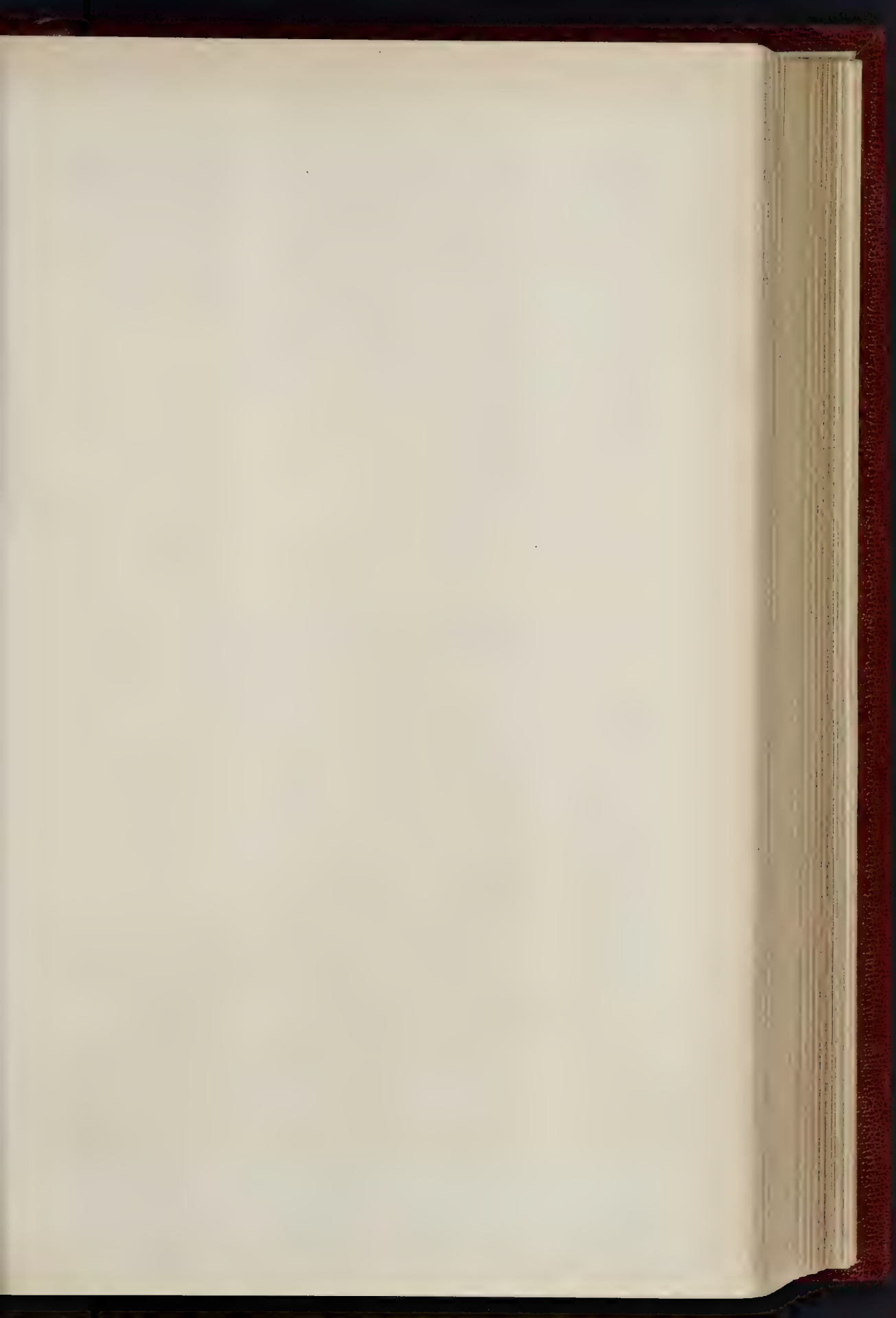


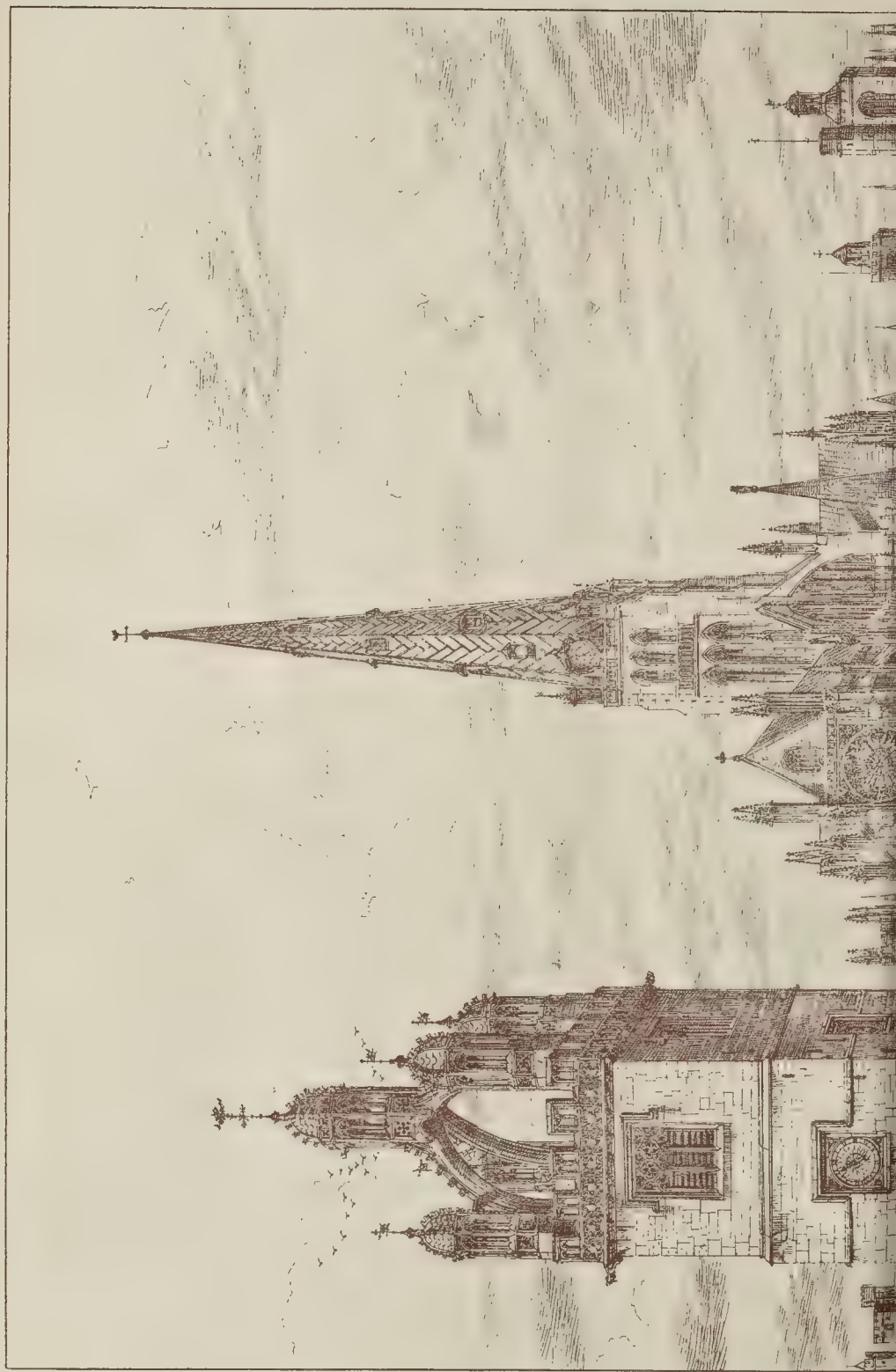


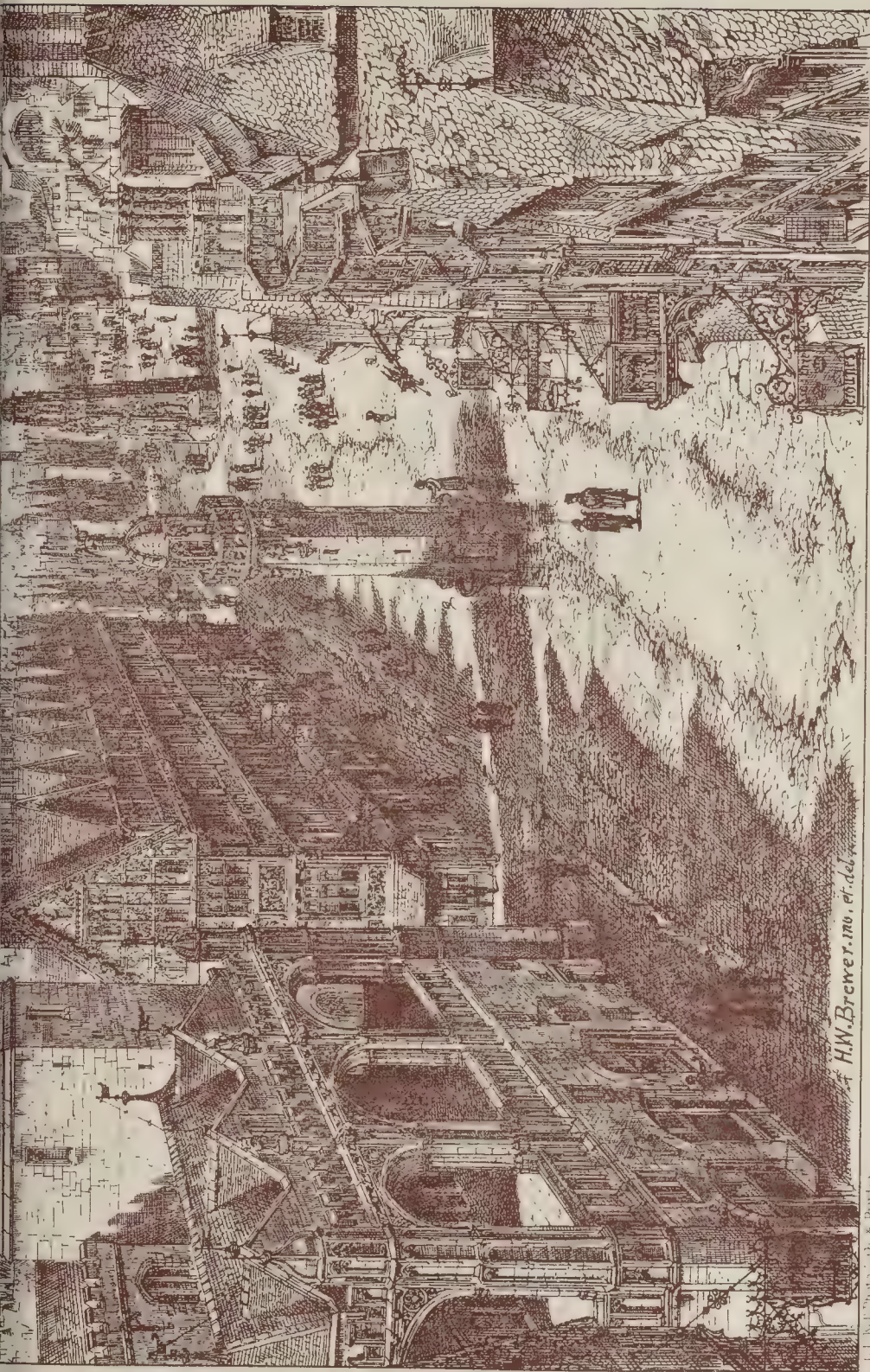
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INDEPENDENT CHURCH, LOWER EDMONTON. MESSRS. Borer & DOBB, ARCHITECTS.







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RAYMOND
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OF PALE

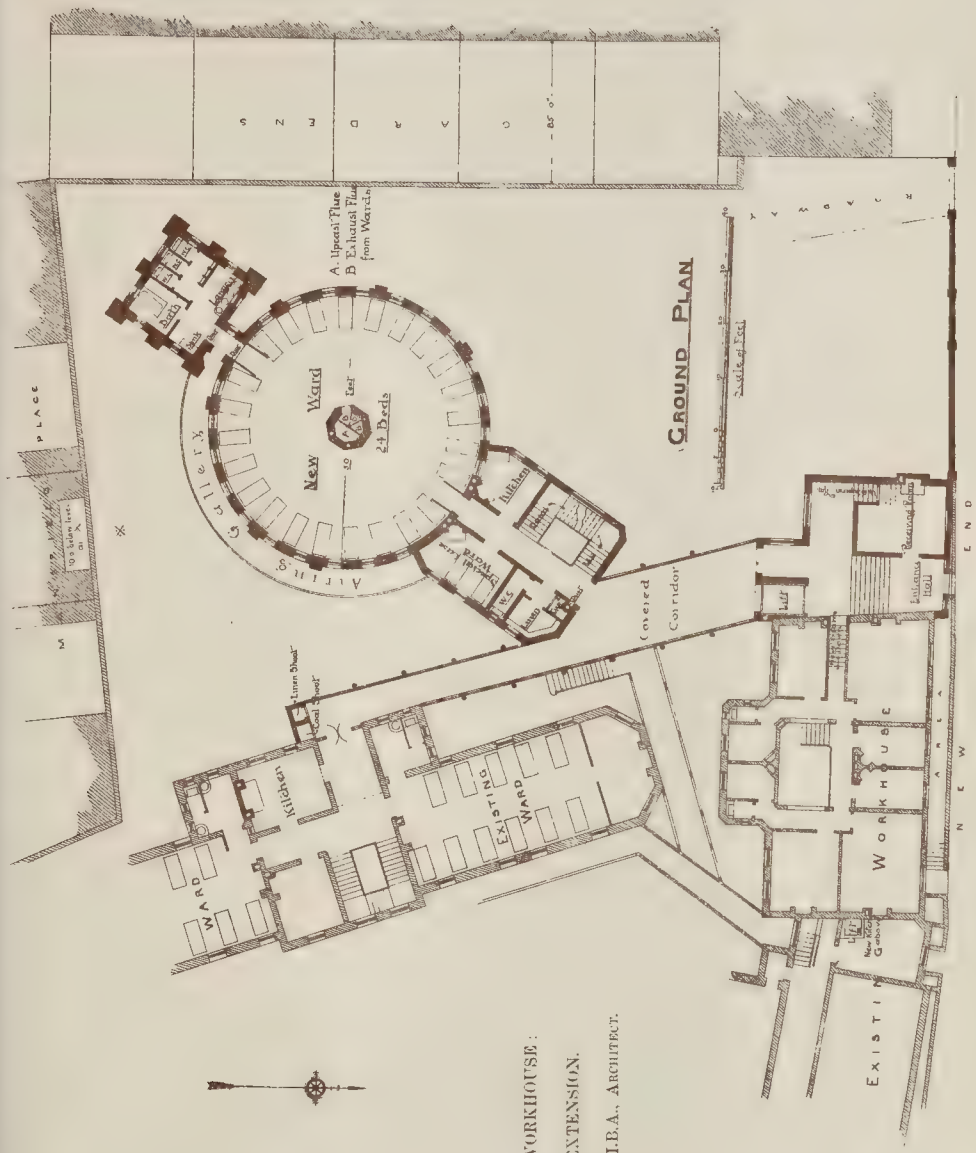
THE C. J. BELL

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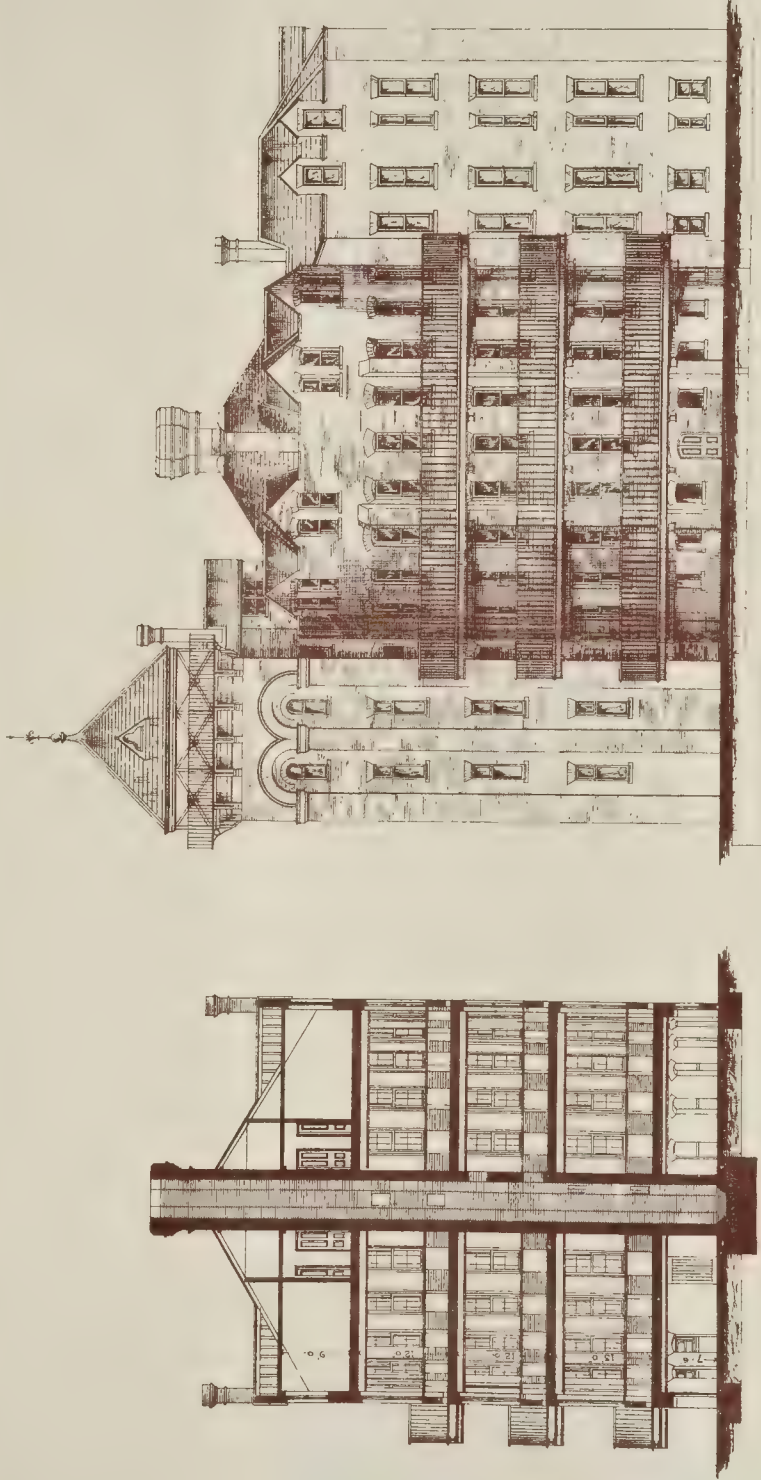
THE HIGH, 100, N.Y.

ST. MICHAEL
AND B. ADDA

ST. MICHAEL
AND B. ADDA



HAMSTEAD WORKHOUSE:
INFIRMARY EXTENSION.
MR. CHAS. BELL, F.R.I.B.A., ARCHITECT.



SECTION THROUGH WARD

SOUTH EAST ELEVATION

Wyman & Sons Photo Litho

HAMPSTEAD WORKHOUSE : INFIRMARY EXTENSION.—MR. CHAS. BULL, F.R.I.B.A., ARCHITECT.

20, Abchurch Lane, London, W.C.

POLICE AND FIRE BRIGADE STATIONS,
NEWCASTLE-UPON-TYNE.

We had prepared for issue with this week's number views of the designs which Mr. Worthington, the architectural assessor, placed first and second in this competition, their authors being Mr. A. B. Gibson and Mr. W. H. Seth-Smith respectively. Owing to an accident, however, we are compelled to postpone the publication of these drawings until next week.

TECHNICAL EDUCATION FOR ENGLISH
WORKMEN.

ARTISANS' TECHNICAL ASSOCIATION.

We last week* gave the substance of the report of the council of this Association, together with a paper read by Mr. Harland, the Chairman of the Council.

In the discussion which took place on the report, Mr. Harland said that the work of the Association was progressing favourably, and they hoped shortly to bring it before the various trade societies of London, through the medium of the committees which had been formed. He moved the adoption of the report.

Mr. J. Robertson, carriage builder, seconded the motion, and expressed his belief that the method in which the Association was proceeding was eminently calculated to be successful, the members of the various trade committees, which were composed exclusively of working men, being more likely to reach the members of their respective trades than the efforts of outsiders.

The motion having been agreed to, the chairman (Mr. G. N. Hooper, vice-president) invited discussion as to the future work of the Association.

Captain Pfoundes asked whether the association proposed to extend its operations so as to reach all the artisans who were members of the existing workmen's clubs? It would be very desirable for it to do so, he thought, for it was his experience, both in England and America, that there were many men in the trades connected with marine architecture and engineering who were very indifferent workmen; and doubtless the same thing could be said of other trades. Most of the lectures given in connexion with workmen's clubs were of a literary or historical character; but it was surely possible and desirable to organise courses of technical lectures in connexion with the clubs?

Mr. Harland said that the Council were most anxious to bring before the members of working-men's clubs, not only in London, but throughout the kingdom, the means of technical education.

Mr. Wright, of the Polytechnic, was surprised that the Council of the Working Men's Club and Institute Union had not taken up the matter of technical education. Personally, he should like to see large technical schools established to take the children as they issued from the Board schools. They would be more teachable than adults, and such juvenile technical schools might, he thought, largely make up for the lack of apprenticeship.

Mr. Hannibal said that as a boot-maker who had been doing his best in carrying on technical classes connected with his trade, he was compelled to admit that he was cognisant of a great deal of prejudice on the part of workmen against technical education. Workmen required to be reasoned with and in a degree educated up to a point to enable them to see the necessity of technical excellence and skill in their crafts. They could only be got at in sections, and by the members of their own trade, in the manner which was being pursued by the Association. Working-men as a body must be disabused of the idea which some of them entertained, that the movement in favour of technical education was merely, as they expressed it, "a move on the part of the employers to get more work done for the same money." That was a very mistaken idea. The primary object of the movement was to improve the men in their work in order that they might retain the means of livelihood. There were many trades the work of which was likely to go to foreign countries unless there was a great improvement in English work.

The Rev. Henry Solly, late Principal of the Artisans' Institute, referring to the results of

the first year's working of the Association, said that they were not so great as could be wished for, but, of course, a great deal of time and energy had to be devoted to the necessary work of preparatory organisation. Another reason why the Association was unable to show better results was due to the apathy of the workmen themselves. Efforts had been made to establish classes in South London, especially in the district lying between Blackfriars-road and Westminster Bridge-road, and in Battersea, without success. As to aid from the City Guilds, the Carpenters' Company had voted the Association twenty-five guineas, on the understanding that the money was to be employed in the establishment of carpentry classes, but in neither of the districts named could they succeed in inducing a sufficient number of candidates to come forward.

Mr. C. T. Millis was inclined to think that the Association was beginning at the wrong end in trying to establish classes at first. He thought they should have held more preliminary meetings to explain their objects and intentions, and to enlist support.

The Chairman said that in his trade (coach-building), at any rate, there was no apathy shown in the matter, for the classes in which he was interested* had been attended by between 200 and 300 students, and similar schools had been established in Manchester, Worcester, Newcastle, and other provincial centres. From these London classes for coach-builders there had also sprung similar classes in New York. These results in the coach-building trade had been brought about by hearty co-operation between the employers and workmen.

Mr. Harland then read the paper which we have already printed, supplementing it by some observations which tended to show the difficulties placed in the way of teachers of technical classes by the requirements of the Science and Art Department. For instance, he said he had a class for Practical Mensuration as applied to the Building Trades. This class was not held under the regulations of the Science and Art Department, but was supplementary to the Class for the Study of Building Construction held in accordance with the Syllabus of the Department. If, while teaching in this latter class the principles of roof construction, he were to teach his pupils to calculate how many cubic feet of timber there were in a roof of a given type, he should be transgressing the rules of the Department, and hence it was necessary for him to hold a supplementary class for the purpose of imparting the necessary practical information to the students.

The Chairman wished it to be understood that the Association had been founded for the purpose of practically assisting the spread of technical education amongst the artisans of this country. One point which had been commented upon in some quarters was that the technological examinations formerly held by the Society of Arts showed a great increase in the number of candidates who passed them since they had been held by the City and Guilds of London Institute. But there was a very easy explanation of that fact, and that was that under the City Guilds Institute the examinations were less strict than they were when under the auspices of the Society of Arts. As to the proposed exhibition of handicraft in connexion with technological examinations, it was a subject which was a little difficult to deal with, and one the details of which would be best considered by the various trade committees which the Artisans' Technical Association had appointed. In some trades it was obviously very difficult to say offhand how specimens of work and skill could be adequately exhibited,—that is, exhibited within reasonable limits of space, and yet with sufficient detail to enable a true estimate to be formed of the character of the work. It had been his lot, as a member of the coach-building trade, to serve upon several international juries. He was, therefore, in a position to say that the French were certainly running all other nations very close in regard to excellence of work in coachbuilding. There was great force in what Mr. Harland had said as to the futility of men going to science classes to learn the rudiments of trades totally disconnected with those which they followed for a living. It was not advisable for a man to attempt to become a "Jack-of-all-trades" unless he were contemplating a lonely sojourn in the Backwoods.

* The St. Mark's Classes for Carriage-builders, George-street, Oxford-street; teacher, Mr. J. Robertson.

Mr. John James, as a teacher of a technical class, testified to the value of Mr. Harland's classes at the Polytechnic, which were of a nature, in his opinion, best calculated to meet the necessities of the case.

Mr. Barber, turner, said he could quite endorse, from his own experience, all that had been said as to the apathy of workmen on this question. One or two efforts to improve the technical efficiency of members of his own trade had thoroughly failed. There was great difficulty in getting workmen to believe that a knowledge of science would be profitable to them. They were too prone to rest content with the way in which their fathers or their "old gov'nors" had done things. If this movement for technical education were to come to anything it must be taken up earnestly by the workmen. It was not so much a matter of money as a matter of sympathy. Even where pecuniary help was given it was not always most judiciously applied. For instance, the Turners' Company for the last few years had organised competitions, and offered prizes for the best specimens of workmanship, but the results of these competitions could hardly be said to be satisfactory. He did not think that the City Guilds Institute made its examinations severe enough,—that is to say, in his own particular trade. The examinations ought to be more thoroughly practical. It was said that plenty of workmen could be got. That was true; but what were they? They were not good "all-round" men, but men who did their work as turners in a merely mechanical manner. They seemed to be devoid of all idea of art. The turnery trade was one which experienced severe competition from the Continent, and even from America. It seemed to him that some of the examinations of the Science and Art Department and of the City and Guilds of London Institute were not quite practical,—not quite in accordance with the requirements of the crafts. He thought that the Science and Art Department, instead of giving two science certificates, should give a science certificate and an art certificate.

The Rev. Henry Solly said that he thought the Association was to be congratulated on the work of organisation it had already accomplished. No technical education was worth anything unless it was in some way illustrated and enlightened by the workmen themselves. Mr. Barber had alluded to the exhibitions of work for which prizes were offered by the Turners' Company, and he (Mr. Solly) must say that he was as much struck with the excellence of the workmanship as with the bad taste of most of the models themselves. As to the apprenticeship system, it was now looked upon by general consent as having broken down; but was it not possible, if not to revive it, at any rate to provide some substitute for it? We had only to look across the water to Germany to find that apprentices there had to be taught so thoroughly that they could not get their indentures after serving their time unless they passed an examination to test their fitness as workmen, and without their indentures they could not get work nor join the important trade societies.

The Chairman said he believed that was altered now,—that the examinations were abolished.

Mr. Solly expressed his surprise at this, and said that if they had been abolished it must have been quite recently.

A gentleman in the room said that he could confirm what Mr. Solly had said about these examinations. They were, to the best of his belief, necessary at the present time. They certainly were so in Leipzig.

Mr. Millis said that the late Sir William Siemens not very long ago at the City Guilds' Institute spoke of the trade guilds of Germany, but he did not think that he led them to suppose that the examinations which had been spoken of were still maintained.

The Secretary (Mr. Channon) said he decidedly understood Sir William Siemens to say that the examinations were abolished in Germany.

Mr. Solly, continuing, said he believed that not only were workmen subject to examinations as to technical fitness, but foremen, and even masters. For instance, no builder in Germany could go into the building trade without having passed an examination to prove his competency. If such a law were introduced in this country we should not have inflicted upon us so many "jerry"-built houses. In connexion with

* See p. 144, ante.

building, he might mention that he was talking some little time ago with one of the largest employers in the building trade in London. He referred to the Chairman of the Master Builders' Association, Mr. Stanley Bird, who appealed to him to know whether he could not tell him where he could get a few apprentices to go into the building trade. It seemed that the Tylers' and Bricklayers' Company in the city had a sum of 150*l.* waiting to be devoted to the apprenticeship of lads to those trades, but they could get no applicants. But even if the old system of apprenticeship were revived, how were the apprentices to get taught? Certainly they would not get taught in the workshops under present conditions, for it was no body's business to teach them, except in some branches of the engineering trades, and even then the work was very imperfectly done. Possibly the system of apprenticeship might be usefully revived under conditions, to be set forth in the indentures, by which the master would undertake to see that his apprentices joined technical classes in connexion with their respective trades. One difficulty in regard to the obtaining of skilled workmen in the present day was no doubt the prejudice which existed in some establishments against the employment of boys. A large employer of labour was conversing with the Clerk of one of the City companies some time ago on this question, and he said, "Oh, we never have any boys in our shops; they are such a nuisance!" Upon which the clerk of the company said, "How can you possibly expect to get good workmen if you will not have boys and train them up to the work?" Allusion had been made to trade unions. There was no doubt whatever that trade unions had a very heavy responsibility in this matter, and he did not think that they were sufficiently alive to the duty which devolved upon them in regard to it. If they kept up the standard of wages, which they had a legitimate right to endeavour to do, they were certainly bound at the same time to keep up the standard of fair workmanship. It seemed to him that unless they did that they were evading their work and shirking their responsibility.

Mr. H. D. Richardson, in moving a vote of thanks to the Chairman, said the objects of the Association might be summed up by saying that they did not want to see the English workman learned with book-learning only, but they wanted to see him skilled in the use of his fingers. He regretted, however, to hear the suggestion which had been made by one speaker about taking children from the Board schools and giving them technical training. Such a course could not fail to arouse the enmity of the workmen, who would resent being brought into contact with large numbers of half-instructed boy-workers. The work of these classes must be supplementary to that of the workshop. Perhaps one reason why this movement in favour of technical education had not progressed as fast as could have been wished was that it was a movement, which came, perhaps necessarily, from above. Personally, he was strongly disposed to think that the work of the Association should be carried on as a propaganda, rather than by the premature establishment of a number of small classes scattered over the country.

Mr. Hannibal seconded the vote of thanks.

Mr. F. T. Mullett said that, as a surveyor, he had had much experience in superintending the operations of large bodies of workmen. He found that various excuses were alleged on the part of workmen for not attending science-classes, but he thought the real explanation was to be found in the fact that the apprentices and boys came to work immediately on their emancipation from school, and as soon as they had done their work they liked to feel themselves free from all restraint. That feeling was indulged for many years, until the apprentices grew into mature workmen, and then they naturally felt a distaste for joining classes. One or two speakers had touched upon the reason why trade unions had not taken up the question of technical education. He did not see why they should take it up. Their opposition to technical education was only the legitimate outcome of their principles. Trade unionism had certain grades or castes, but the unions were mainly ruled by the trade delegates, who were the medium of communication between the members and the great political leaders. These delegates were not necessarily superior craftsmen, and some of them might possibly think that with the spread of technical educa-

tion they would be likely to be ousted from their positions. He was glad that Mr. Harland had touched upon what he believed to be the keynote of the whole thing, that the school and the workshop must go together. He did not know how much money was spent annually by the Science and Art Department, but he knew it must be a vast sum; and he knew from what he saw about him that it was wasted. The examinations, as conducted, did not always enable the best man to pass. If a teacher had a large number of pupils under technical instruction in a workshop, they would carry back a great deal of what they learned to those who were not attending the classes, and the boys would learn very much there from the mere instinct of copyism, so that if a teacher had a hundred pupils being taught in this way, it might be taken for granted that he had 150 or 160 learning from him.

Captain Pfoundes suggested that it would be as well for the Association to promote the foundation of an art class to teach the workmen who were engaged in paperhanging and the internal decoration of houses a knowledge of at least the rudiments of good taste. Such men were often sent away to do small jobs without any skilled supervision, and they were frequently quite incompetent even to decide what papers were best fitted for inferior rooms, and what would be best fitted for the more important rooms. The result of their want of knowledge in this respect was often exceedingly unsatisfactory. The same want of taste on the part of English workmen was felt abroad. He had had occasion to have a small museum for the display of objects of Oriental art fitted up in New York, and in the internal decorations and fittings of the premises he had been compelled to employ French and German workmen in preference to Englishmen, simply because English workmen were most deficient in taste. In mentioning this fact to a firm in New York he was told that his was only a common experience.

After a few further remarks from other members the proceedings terminated.

ARCHITECTURAL ASSOCIATION.

VISIT TO THE GUILDHALL COUNCIL CHAMBER.

THE first of the Saturday afternoon visits by the members of this Association was made last Saturday, the 26th ult., to the new Guildhall Council Chamber. Notwithstanding the great inclemency of the weather,—it being a very wet and stormy afternoon,—the members assembled at three p.m. in pretty strong numbers, and every portion of the new chamber from basement to roof (or rather dome) was minutely inspected by them. As this building has been so recently illustrated and described in our pages,* it will be unnecessary to say any more on the subject. As our readers are aware, the works are being carried out by Mr. B. E. Nightingale, of the Albert Embankment, from designs by Mr. Horace Jones, the City Architect.

NEW OFFICES, 4, FENCHURCH-AVENUE.

The members next proceeded to Lime-street, E.C., to inspect some offices and chambers recently erected at No. 4, Fenchurch-avenue. Here they were met by Mr. Alfred Howard, the architect of the buildings, and who proceeded to explain the drawings and chief features of the erection. This consists of a spacious block of buildings of three floors, besides the ground-floor and basement, with two elevations, one in Fenchurch-avenue, and the other to the churchyard, being the flank, and faced with white bricks and stone dressings. The front elevation is faced with Portland stone, and has red polished granite pilasters and columns. The principal granitic architect has had to contend with has been to avoid obstructing the neighbours' light, and at the same time to obtain a maximum amount of light for the whole of the offices and chambers, which are erected for the accommodation of brokers and merchants, and are situated in very narrow and cramped up thoroughfares, and surrounded by very lofty buildings. Altogether the architect has succeeded fairly well in surmounting the difficulties of site. The several offices and chambers on each floor are reached by corridors paved with mosaic paving and stone staircases, with neat and strong ornamental cast-iron balustrading by the Coal-

brookdale Company. The whole of the work has been executed from the designs of the architect, by Messrs. Colls & Sons, builders, of Moorgate-street.

WEST LONDON SCHOOL OF ART.

THE presentation of prizes to the students of the West London School of Art took place on the evening of Thursday, the 24th ult., in the Steinway Hall, Seymour-street, Portman-square. Mr. G. A. Thrupp occupied the chair, and Mr. J. Comyns Carr made the distribution.

Mr. J. S. Rawle, the head master, read his report for 1883, which stated that the school had gained a much higher position than in any former year. Although the number of students had somewhat decreased, yet there had been a satisfactory increase in the fees. In the "National Art Competition" the school had gained twenty awards as against fifteen in 1882, and had, in fact, obtained nearly 28 per cent. of the total number of national medals, &c., awarded to the sixteen Metropolitan district schools of art. In the Government third grade advanced examinations for 1883, the school stood first in the kingdom, and it had gained the highest Government grants among individual schools. The "Morse-Smith Travelling Studentship," of the value of 50*l.*, had been awarded to Carl Almqvist, who is spending two months in Italy for the purpose of studying decorative art. The committee expressed their thanks to Mr. J. H. Donaldson for the loan of art objects, and to Mr. Crace for the loan of books on art.

The Chairman remarked that the success of the school was mainly owing to the exertions of Mr. Rawle. Such a school was a necessity in a large borough like Marylebone, and they were compelled to rely somewhat upon extraneous assistance in order to keep up its efficiency. He trusted, therefore, that a large number of the wealthy persons living in the borough might be induced to help the education of the youth of the locality so as to enable them to take a prominent part in the great industries of the day.

Mr. J. Comyns Carr then delivered an address to the students, in the course of which he said that our countrymen seemed at last to be awakening to the importance which the study of art holds in the scheme of our national life. It was a necessity which, if they were to compete with other nations, must be had at whatever cost, and a necessity which they began to feel even without the thought of competition. His relationships had taken him into other towns besides London, and he had observed not merely a gradual awakening in relation to private enterprise, but a new perception on the part of the municipalities in this matter. We had long prided ourselves upon the virtues of private enterprise, and what was being done in this school was an admirable instance of what could be done by private enterprise, seconded, as it must be, by the devotion of those for whom it was established. At the same time, private enterprise was a bad thing when it stood in the way of public spirit. In England we had too often complacently swallowed compliments on the virtues of private enterprise, and had forgotten that if it was to succeed, it must be backed up by public spirit, which, although equal to the support of other matters, had not always been equal to the legitimate support of the necessities of art. About a year ago he made a journey through France, for the purpose of examining and investigating what was being done in the museums and schools of art throughout the provinces. The result of that journey was in many respects a surprise. He found in nearly all the towns he visited a long-founded and well-established tradition. Each municipality had its museum and its art school, supported out of the municipal funds, and in which an art education, of varying value,—but never without value,—was accessible to all the students of the town, free of expense. Thus for years and years the French nation, in its provincial, as well as in its metropolitan life, had recognised this as one of the prime functions of municipal duty,—not merely to clean the streets and protect its citizens, but also to supply the townships with the necessities and claims of art. In this country there was much to do in making art an integral part of the national life, permeating not only the upper and middle classes, but reaching the artisan class, and giving a new sense and value to their labour. He did not consider that the English people had an inferior genius for art.

* See vol. xlv., pp. 639, 720, 723.

They were constantly told that it was the sky of Italy which produced its great art, but it had never been explained how, with its lovely climate still enduring, Italian art had perished. Even M. Taine told them that the climate and sunlight of Venice had produced the colouring of Titian and Giorgione, but he had not explained how Milan, with a climate as bright and sunny, had produced a school of art without any reference to the richness of colour noticeable in the Venetian school. They were, therefore, led to the conclusion that art in its last resort was dependent on the spirit and work of man, and he believed that if the people of this country, with its splendid record of imaginative literature, its noble roll of poets, its heroic history, and its magnificent art architecture, chose to address themselves to the study and pursuit of art, allowing it to enter into their lives, and insisting upon learning from all other nations, there was no reason, either in their climate or their genius, why they should not rise to the very highest position yet achieved in that direction. They must remember that art was not to be got suddenly, and even amongst the most favoured nations it had been the result of long tradition and earnest seeking, and he believed it to be within the reach of the people of this country. The student, upon entering on his career, could not look too high. Every bit of design nobly done involved a knowledge of the very highest and subtlest sense of beauty, and those who had entered on the study of art would never find cause to regret it, and whilst conferring pleasure, it would also give pain. If the spirit of beauty really entered into their hearts and lives, it would beget not merely a new pleasure and profit, but also a newer and keener sense of pain in regard to the suffering and squalor of the century in which they lived. The spirit of art in this sense was something more than a trade or profession: it was something by which, in endeavouring to make their own lives nobler, they would be impelled to look on the lives of others less fortunate than themselves, and to try and benefit them.

Mr. Carr then presented the prizes, of which there was a very large number.*

In the National Art Competition, the following were among the awards made:—

Gold Medal (and 10l worth of Books on Art).—Design for tiles, William H. Woodall.

Bronze Medal.—Decorations of a Room, Carl Alquist.†

Bronze Medal.—Design for a Wall-paper, Charles G. Edwards.

Bronze Medal.—Historic Styles of Ornament, Leonard Wyburn.

Queen's Prize.—Design for Wrought-iron Gates, Matthew Garbutt.

Queen's Prize.—Figure Designs for Panels, Henry A. Pagan.

Queen's Prize.—Design for Ceiling Decoration, Henry A. Tidmarsh.

A National Scholarship, of the annual value of £21, was awarded by the Science and Art Department to Francis K. Abraham, and in the Owen Jones competition, the first prize, out of six offered for competition by the Society of Arts, together with the Society's Bronze Medal, went to William H. Woodall.

Mr. Donaldson proposed a vote of thanks to the masters of the West London School of Art, and paid a high compliment to Mr. Rawle's energy and ability.

Mr. Rawle, in reply, said that the masters were deeply thankful for the manner in which the students had done their part of the work. No fewer than 133 out of a total of 491 students had carried off prizes or certificates. This proportion showed how hard they had worked, and he believed there was no other school which could show a more favourable percentage of successful students.

Votes of thanks to Mr. Comyns Carr and to the Chairman closed the proceedings.

Glass Slabs as a Remedy for Damp Walls. The suggestion is made in a German contemporary that in order to prevent the unpleasant dampness of walls and the exhalations arising from asphronite, it is advisable to cover the places in question with glass slabs of the most ordinary quality. They are firmly fixed with cement to the wall, and a thick coating of mortar is applied to protect the glass from concussion.

* It being impossible to exhibit a fair proportion of the students' works in the hall, it was announced that there would be an exhibition of them in the school buildings, 155, Great Titchfield-street, this Friday and Saturday, Feb. 1 and 2.

† This student receives books only, as he has previously gained a Medal in the same stage of study.

THE INFLUENCE OF CEMENT MORTAR ON LEAD PIPES.

INVESTIGATIONS reported in the *Metallarbeiter* have demonstrated in an exact manner the appearances which are noticeable when a lead pipe has been for five years in a layer of Portland cement. A red coating was noticed from 1-24th to one-eighth of an inch in thickness, the appearance of which corresponded with that of oxide of lead as it is usually delivered in commerce. This coating was carefully removed and the particles of lead removed along with it were separated by means of a magnifying glass. The specific gravity of this powder (carefully defined, at 59° Fahr. and reduced for a vacuum) varied between 8.002 and 9.670. This variation is explained by the presence of metallic lead mixed in the oxide of lead and of carbonate of lead. Qualitative analysis demonstrated that this powder contained oxide of lead, lead, carbonic acid, water, and traces of calcium. The composition of the powder was as follows:—

Oxide of lead.....	84.89
Lead.....	12.33
Water.....	0.99
Carbonic acid.....	1.53
Lime.....	Traces.
Insoluble in nitric acid.....	0.16

This coating on the lead pipe appears to have been formed by the action of the oxygen in the air in union with that of the lime contained in the mortar. It is remarked that the action of lime-water on lead has also been noticed by Besnon.

LEICESTER SOCIETY OF ARCHITECTS.

The eleventh annual meeting of this society was held on the 22nd of January, when the following officers were elected:—President, Mr. W. Jackson; honorary secretary, Mr. A. H. Paget; council, Mr. R. J. Goodacre, Mr. Josh. Goddard, Mr. W. Millican, Mr. J. B. Everard.

In the course of his address, the President made the following remarks, with reference to a recently-advertised competition:—"There is one subject which is probably uppermost in your minds, and which will not come before you in the report. The report deals of course with events and proceedings of the past year, and the subject of architectural competition has but recently been forced upon your notice; upon this subject I must be allowed to make a few remarks. Some years ago it was generally supposed that if a man, or a society of men, wanted to get the most work out of the architects for the least money, the proper thing to do was to go in for what is called an open competition. It was believed that it was only necessary to draw up a set of absurd conditions, and advertise them, with a bait of 20l. or 30l., in order to catch any number of architects as in a net,—a net spread in the sight of all men. Experience soon proved, however, the intility of such proceedings, not only from the point of view of the architects, but from that of the employers themselves; open competition was found to degenerate very often into a scramble, and to develop work which was showy and superficial rather than good, and, as a matter of fact, open competition, except in special cases, and under well-ordered conditions, has already ceased to be the rule. But the old ideas linger, as old ideas are apt to do, from ignorance and prejudice in certain places; and thus, from time to time we are surprised by a publicly advertised competition, which revives the worst traditions of the past.

The principle laid down by the Institute is perfectly clear. The actual and final competition should be limited, and each competitor should be paid for his work; the drawings should not be more in number, or to a larger scale, than is necessary to explain clearly the design; there should be no playing fast and loose with the author of the premiated design, and there should be a properly-qualified judge.

Now, with respect to a competition recently advertised by the Town Council of Leicester, and which your Council does not consider satisfactory, you will observe that the above conditions, which have been drawn up and sanctioned by the Institute after a long and careful study of the subject, are not complied with; on the contrary, the selection of designs is intrusted to a sub-committee, who will report to the Estate Committee, who, assisted if they see fit by a professional architect, will make selection of two designs for the Town Council, who will make

the final decision, who will also reserve to themselves full liberty of action with respect to all proceedings in connexion with the proposed buildings, and are not bound by anything done under or in connexion with the competition, except the payment of premiums. Some troublesome rights of light are involved with which intending competitors are instructed not to interfere, or render the Corporation liable for damage. Each design is to be drawn to a large scale, 6 ft. to an inch, the sizes and heights to be marked in figures, and is to consist of a plan of each floor with sections, together with three elevations and a perspective view, accompanied by a written description, setting forth in detail the character of the material and workmanship, and an approximate estimate of the cost. The first premium of 25l. is to merge in the commission, if the author of the premiated design is employed to carry out the work, and in that case the commission is to be considered as payment for all matters or things arising out of or connected with the erection and completion of the buildings. The premiated designs are to become the property of the Corporation, and the whole of the subsequent contract drawings and specifications are to be given into the possession and to become the property of the Corporation, who reserve the right to reject the whole or any of the designs if they should appear unsuitable or of too expensive a character."

GLASGOW INSTITUTE OF ARCHITECTS.

PROPOSED BURGH BUILDING ACT.

AN Extraordinary General Meeting of the Glasgow Institute of Architects was held on the 23rd ult. for the purpose of considering the draft of a proposed Burgh Building Act, — Mr. James Thomson, F.R.I.B.A., president of the Institute, in the chair. Mr. William MacLean, writer (the hon. secretary), read the correspondence with the Lord Advocate as to the proposed Building Act, in which his lordship stated that he would be glad to receive a proof of the draft Act, and thereafter to receive a deputation from the Institute on the subject.

The President said they would doubtless remember that a deputation from this Institute, consisting of Mr. John Honeyman, Mr. Campbell Douglas, and himself, waited on the Lord Advocate in London on the 29th of June last, to impress on his lordship the Institute's views on the desirability of having a Building Act apart from the proposed Police Bill in Scotland. He having expressed a wish to avoid some of these proposed details more fully before him in writing, the draft Act now to be considered had been prepared by the Council. Some months ago he convened a committee appointed by the Council to consider the subject. Afterwards several meetings were held, and the matter was fully discussed. He thus procured some very valuable suggestions which were embodied in the Bill now to be considered. He was glad to say that it had been endorsed unanimously by the Council, and he hoped it would be adopted by the Institute with the same unanimity, especially as they were all cognisant of the cogent reasons that had been advanced first and last by the Institute for the reform being of the radical nature proposed, instead of trying to patch up and improve the present Acts. He was decidedly of opinion that the members of their profession were the proper parties for the framing of such an Act, and the Institute had taken up the matter solely *pro bono publico*, and it had done so alone, without alliance or understanding with other bodies interested in lauds and buildings. They were alive to the fact that some gentlemen who had had great experience,—as, for instance, Mr. Honeyman,—went even further than this, and advocated that all the Building Acts throughout the country should be swept away, and that the Legislature should provide an Act applicable to all buildings throughout the United Kingdom. Undoubtedly this reform would be a desirable one, and in many respects a considerable boon to the public; but he was doubtful if the time had arrived yet when town councils and corporations were prepared to surrender their legislative powers to Imperial Parliament. They would, for the present, receive with thankfulness such an Act as the one proposed by the Institute, as it would very materially tend to remedy the evils they had over and over again alluded to. There were a few points in the Bill to which he would call special attention. In section 16 important regulations as to the projections were suggested. In section 29 it was proposed to furnish to the Dean of Guild Court a ground or block plan only. Section 33 contained provisions for the prevention of overcrowding. At present there are many more dwellings on each stairlanding allowed than the Institute aimed at having under this section. Sub-section 19 related to factory stairs, and sought to give protection and means of escape to the workers in such buildings in case of fire.

On the motion of the President, seconded by Mr. Sellers, it was unanimously agreed to adopt the draft print of the proposed Building Act submitted to the Institute, and the Secretary was

instructed to forward a copy of it to the Lord-Advocate.

On the motion of Mr. Sellars, seconded by Mr. W. F. McGibbon, the following were appointed as a deputation from the Institute to wait upon the Lord-Advocate to give his lordship any explanation he may desire, viz.:—James Thomson, president; Campbell Douglas and John Honeyman, past presidents.

On the motion of Mr. David Thomson, seconded by Mr. Bromhead, a committee, consisting of the whole Council and the past presidents and vice-presidents, was appointed to take charge of the architectural examinations, about to be held in Glasgow, of candidates desirous of qualifying for the Associateship of the Royal Institute of British Architects, Mr. Campbell Douglas to be convener, and Mr. T. L. Watson sub-convener.

On the motion of Mr. David Thomson, seconded by Mr. Landless, a vote of thanks was awarded to the president for the great time and attention he had bestowed in connexion with the preparation of the draft Building Act.

ART IN THE HOUSE.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

Mr. R. W. Edis, F.S.A., delivered an address before the Leeds and Yorkshire Architectural Society on Monday evening last, on the furniture and decoration of ordinary houses. In the course of his remarks, Mr. Edis insisted strongly that while everything in the house might and should be beautiful in form and harmonious in colouring, there was no necessity that good artistic treatment of wall and floor surfaces, and of the general fittings and furniture, should involve any greater outlay in more cost than if everything were of the ordinary common-place and inartistic character, and that while everything might be beautiful and good in taste, common sense and fitness for the wants and necessities of everyday life should be the first consideration. He regretted that the architect or chief designer of the house was not more extensively employed to advise on the clothing of the rooms he had designed, but insisted strongly that before he could gain the confidence of the public in matters of taste he must prove that he himself possessed the artistic culture, knowledge, and taste by which he might fairly claim a right to advise, and that too often common sense was superseded by some outlandish craze, which under the name of "aestheticism," or fashionable ignorance, led to peculiarities and eccentricities in design which were neither beautiful nor useful. Mr. Edis urged upon his audience the advantage—if only from a health point of view—of having the general fittings of the various rooms so designed that they should offer no large surfaces for the accommodation of dust and dirt, which could not be at once seen and got rid of, and especially condemned the ordinary wardrobes and bedroom furniture, which provided any amount of dust-traps, injurious to health, cleanliness, and comfort.

THE HOSPITALS ASSOCIATION.

The following will be the order of proceedings at the inaugural meeting of this Association, which is to take place in the Egyptian Hall of the Mansion House, on Friday next:—The Lord Mayor will take the chair at three o'clock, and after a statement by Major Ross, M.P., the chairman of the Provisional Committee, in explanation of the objects and scope of the proposed Society, the following resolutions will be submitted:—

1. That in the opinion of this meeting it is desirable to establish, under the name of the Hospitals Association, and on the basis of the constitution prepared and adopted by the Provisional Committee, an organisation for the consideration and discussion of matters connected with hospital management.

2. That the preliminary arrangements connected with the establishment of the Association, including the appointment of the first council, be entrusted to the Provisional Committee.

3. That the best thanks of this meeting be given to the Right Hon. the Lord Mayor, for placing at the disposal of the Provisional Committee the use of the Mansion House, and for his courtesy in presiding over the proceedings this day.

The speakers will include Earl Stanhope, Lord Frederick Fitzroy, Sir T. Fowell Buxton, bart., Sir Rutherford Alcock, K.C.B., Mr. Timothy Holmes, and others. The Provisional Committee desire very specially to invite the attendance of hospital governors and subscribers, and of the clergy, ministers, churchwardens, and other officials connected with congregations contributing to the Metropolitan Hospital Sunday

Fund. A large number of cards of admission have been issued and applied for, and the secretary of the Association, Mr. J. L. Clifford-Smith, will gladly supply more if those desirous of being present will communicate with him. The office of the Association is at No. 1, Adam-street, Adelphi, W.C., where further information can also be had.

INTERNATIONAL HEALTH EXHIBITION, LONDON, 1884.

THE Sub-Committee on Water Supply and Sanitation have prepared a memorandum on the exhibits which are sought for Classes 21, 22, 23, and 27 of Group 3, "The Dwelling." With a view to bringing before the public examples not only of thoroughly good sanitary arrangements, but also of the defects existing in ordinary houses, the Committee have, with the sanction of the Executive Council, undertaken to supervise the erection of two model dwellings in the grounds of the exhibition, one of which will show, as far as can be done on the limited site, a house with good sanitary arrangements, while the other will show the usual defects. In the latter case, no attempt will be made to exaggerate the ordinary conditions; but the object will be to reproduce accurately a state of things unfortunately too common. Besides these typical illustrations, the Committee will be glad to receive from many fabricators whatever examples they may think proper to submit for exhibition of the articles indicated by the classification. It is to be borne in mind that in all cases the exhibits must have a distinct bearing upon health, and that architecture or building construction generally is outside the scope of the exhibition. The exigencies of space limit the number of exhibits of the exhibition to invite contributions illustrative of schemes for drainage, water supply, &c., applicable to towns or large districts, and it is, therefore, to be understood that the exhibits must be confined to domestic sanitation alone. The Committee would impress upon exhibitors the desirability of, as far as possible, exhibiting their own manufactures only, not those of other makers, and also of restricting their exhibits to typical examples of their appliances, and of not sending more than a single example of each article. Indeed, the Committee cannot undertake to find space for things which are substantially duplicates of one another. As the exhibition will be a place of popular resort, and is intended for the instruction of the general public rather than specialists, it will be desirable that exhibitors of sanitary wares should assist the Committee in making such arrangements as will bring the articles which it is necessary to show before the notice of the public in a manner as agreeable as possible. It will, of course, be necessary to show examples of chimneys, urinals, &c., but these should be so arranged that while it may be possible for anybody desiring to inspect their action to have full opportunity of doing so, they yet will not attract general attention in an undesirable manner.

A memorandum prepared by the Sub-Committee on the construction and fittings of the dwelling-house has just been issued. The committee think it should be distinctly understood, with regard to all the classes in which are to be shown buildings, furniture, fittings, &c., that only such exhibits as have a distinct bearing upon health can be admitted. Specimens, therefore, illustrating building construction generally, the decoration of houses, or their furniture, cannot be admitted unless they are shown to have actual reference to the health of the inmates of the houses. It is desired that exhibitors should show, as far as possible, their own manufactures only, and not those of other makers, and they should restrict their exhibits to typical examples of their appliances, not sending more than a single example of each article. It is desired to show not only models and designs for sanitary houses, but also, so far as possible, specimens showing their construction. It is desirable that those exhibitors who are prepared to erect specimens of actual buildings should, as far as possible, co-operate with other exhibitors who may be desirous of showing fittings or furniture for such buildings. The executive will, as far as possible, facilitate such arrangements, but it will be well that the exhibitors should agree between themselves as to the manner in which such collective exhibits may be arranged. Under the proper class may be included, in order to draw attention to existing defects, specimens of unsanitary decoration, such as arsenical wall-papers, hangings, &c., so that the public may be taught what to avoid. Special interest would attach to any evidence of equally good effects being obtained by the use of harmless materials, and in many cases it may be desirable to show side by side, for purposes of comparison, papers, fabrics, &c., treated with poisonous colouring matters, and also with colouring matter of a harmless character. One of the classes includes all appliances for personal cleanliness, public and private baths, &c. It is hoped that a full display of these may be forthcoming. The Executive Council have had under consideration the question of fitting up baths for actual use in the Exhibition, as was done in the B-21 Exhibition, but it has been decided that it would be sufficient to show baths completely fitted, without putting them into action.

The Sub-committee on Dress have prepared a memorandum showing the class of exhibits which is desired for that group. The classification includes collections illustrative of the history of dress, national costume, &c.; waterproof clothing, india-rubber, gutta-percha, &c.; dresses for extreme climates, &c.; dress for sport, hunting suits, &c.; life-saving dress, divers' dress, fireproof dress, &c. There is also a special class devoted to the comparative value of different dress materials for articles of clothing. Under it should be displayed a number of illustrative specimens to show the comparative value of different dress fabrics with reference to their warmth, their hygroscopic properties, the influence of the colour of materials in modifying the effects of sun-beat, and the like. It would be well to show under this class models and drawings illustrative of the effects of poisonous dyes (in clothing) upon the skin. Materials dyed with poisonous and non-poisonous dyes could be placed together for purposes of comparison. The Sub-Committee are prepared to arrange for a special display of materials and garments, &c., worn next to the skin. Some of these will be shown in a special annex, to which females alone will have access, or which will, at least, not be open to both sexes at one time. As one special feature in such an exhibition, the Sub-committee would suggest a number of models displaying the first clothing of infants as adopted in the various countries in the world,—as far as such examples could be obtained. Special attention will be given to dresses suitable for women engaging in exercise, such as dresses for mountaineering, for the moors, for swimming, for horse exercise, for gymnastics, and the like. Under the class devoted to life-saving dress, &c., should be actually demonstrated the value of certain substances used for making muslin and like fabrics non-inflammable. The various artificial starches made for this purpose should be displayed, and their use and effect suggested among machines they may be dealt with in this class, also special dresses recommended or in use in factories and occupations of special character, e.g., dresses for lead and other factories, dresses of nurses and sick attendants, of soldiers and sailors, life-saving dresses, firemen's dresses.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, the 22nd of January, Sir Frederick Bramwell, F.R.S., vice-president, in the chair, the paper read was on "The Adoption of Standard Forms of Test-Pieces for Bars and Plates," by Mr. William Hackney, B.Sc., Assoc.-M. Inst. C.E.

In breaking test-pieces of the same quality of tough metal by direct tension, very different results were obtained according to the form of the test-piece employed. The sample that one engineer would define as stretching nearly 44 per cent., before fracture, was classed by another, using a test-piece of different form, as stretching less than 28 per cent. In fact, to obtain from any bar of metal relatively high percentages of ultimate stretching, all that was needed was to use short or thick test-pieces.

Mr. J. Barba had shown, in a paper published in the *Mémoires de la Société des Ingénieurs Civils* in 1880, that test-pieces of the same form, namely in which the ratio of length to diameter was the same, gave the same percentage of ultimate stretching whatever their size might be; but that in those of equal length but differing in diameter, or of equal diameter but of different lengths, the percentages of ultimate stretching varied very much.

Notwithstanding the extent to which the result obtained in testing a sample of ductile metal was thus affected by the proportions of the test-piece used, no standard dimensions or proportions for such pieces had been generally adopted, and those in common use varied very much. Sir Joseph Whitworth, for instance, advocated the use of a test-piece 0.798 inch in diameter by 2 inches long, or 2.51 diameters long, and the test-piece in use at Woolwich Arsenal was 3.75 diameters in length. From these proportions the ratio of length to diameter was increased in the test-pieces adopted by different engineers, especially on the Continent, to 10 or even more. The ultimate stretching of test-pieces cut from the same bar of mild steel, similar in form at the ends and of these different proportions, would be:—

Ratio of length to diameter.	Ultimate stretching per cent.
2.51	44.5
3.75	37.5
10.00	28.2

The proportions of the strips, in which plates and flat bars were tested, had almost as great

an influence on the percentages of ultimate stretching, as had the proportions of cylindrical test-pieces, and those in general use varied nearly as much.

Mr. Barba showed, that in the case of pieces cut by lathe or planing-machine from the same bar of metal, the law of similarity, that was the law that test-pieces similar in form gave the same percentage of ultimate extension, whatever their size, was as strictly true in the case of flat as in that of cylindrical test-pieces. The effect on the percentage of stretching of the transverse dimensions of an ordinary strip of plate or flat bar, was not so great as in the case of a cylindrical test-piece, as in the strip, whatever might be the width, the thickness remained always that of the piece of metal tested.

Test-strips of mild steel plates, 0.5 in. thick and about 1.4 in. wide, that stretched 27.5 per cent. in a length of 8 in., stretched 37.3 per cent. if the measured portions were only 2 in. long; and in rather harder plates, which stretched 20 per cent. in a length of 8 in., the extension in 6 in. was 25 per cent., and in 4 in. about 32 per cent. The test-strips used at the Crowe Works of the London and North Western Railway Company were only 2 in. long, and those employed in some tests of boiler-plates made at Sheerness Dockyard in 1875, and at Chatham Dockyard in 1879, were 4 in. long; but the length of test-strips adopted for plates, both in this country and abroad, was almost universally 8 in.

The impossibility of comparing the results of tests made by different experimenters of the ultimate stretching of metals, in the absence of standard forms of test-pieces, had long been felt by engineers, and had led to the adoption of several alternative methods of comparing their relative toughnesses.

When a bar of ductile metal was stretched to breaking, it at first extended equally from end to end, with each successive increment of load, until the maximum load that it could carry had been reached, and up to this point the percentage of stretching was absolutely independent of the proportions of the test-piece used. This percentage of extension would thus appear to be the most important in comparing the structural values of metals, and to be that which should be always the most particularly noted; but practically testing in this way would be more tedious than the ordinary mode of loading the piece until it broke, and then measuring the elongation after fracture; so that in ordinary technical and commercial work, this latter plan would always be preferred.

Another method that had been adopted to a considerable extent, for obtaining comparable measurements of the toughness of metals, without using test-pieces of uniform proportion, had been to measure not the linear stretching, but the percentage of contraction of area at the point of fracture. Practical objections, however, to this were, that the contraction of area could be much less accurately measured than the increase in length, and that as a tough piece of metal often broke irregularly, it might be difficult to determine what its exact diameter at the point of fracture should be taken to be. Whether on account of the difficulty of accurate measurement, or owing to the percentage of contraction of area not being exactly proportional to that of stretching, it was certain that the results obtained by the two modes of measurement seldom precisely agreed.

A third mode of obtaining comparable results in testing by tension would be to use very long test-pieces and to reject the percentages of stretching near to the point of fracture; but this would be expensive, and often inconvenient or even impracticable, and would not always give accurate results; for a long bar, when stretched to breaking, often began to draw down simultaneously in several parts of its length. The use of comparatively short test-pieces of some standard forms, seemed thus to be the best method of making tests of the quality of bars and plates of ductile metal that could be employed.

The length of 8 in. in the testing of plates, was the only dimension of test-piece that appeared to be generally adopted; and as it was very desirable that the standard forms for cylindrical and for flat test-pieces should be such that the same metal might give the same percentage of stretching, whether tested in the no shape or in the other, this length, with a convenient width and an average thickness, might well be taken as the standard form, and

that for cylindrical test-pieces be determined by experiment, so as to correspond with it.

The effect of hammering or rolling in increasing the toughness of metals was so marked, that in determining the shape of the cylindrical test-piece that would give the same percentage of ultimate stretching as the standard form adopted for plates, both shapes should be cut by lathe or planing-machine from the same bar, so that one might not be made from metal more drawn down than the other. This increase in the toughness of iron and steel explained the fact, that in testing plates and rivet-bars, it was found that metal of the same quality stretched nearly as much in test-pieces of the same length, whether the bars and plates were thick or thin. The use of a test-piece 8 in. long was a more severe trial for a thinner than for a thicker plate; but the toughness of the former had been so much increased by the greater amount of rolling to which it had been subjected, that the one stretched before fracture nearly as much as the other.

As test-pieces similar in form had been found to give the same percentage of ultimate stretching, whatever their size, it might be better to define the standard cylindrical test-piece rather as being of a certain form than of a particular length. This would facilitate the adoption of the same form by engineers of different countries, using different units of measure. In testing plates and bars such as rivet-bars, which were reduced to the size of the test-piece by hammering or rolling, it would be best to retain, as at present, one length of test-piece, whatever the transverse dimensions. In fixing the standard forms, the effect on the percentage of stretching of the distance from the datum points of the test-pieces of the shoulders or enlargements at the ends by which they were to be fixed in the testing machine, should not be overlooked. The enlargement might begin, for instance, half a diameter beyond each datum point, and its radius of curvature might also be half a diameter.

The whole subject of the testing of metals by tension seemed to be well worthy of consideration. If a uniform system of testing could be generally introduced, so that tests made by engineers in all parts of the world might be directly comparable, the advantage would be very great.

ANCIENT REMAINS IN CHANCERY-LANE.

On this subject some interesting notes were recently read at a meeting of the London and Middlesex Archaeological Society by Mr. Sachs. He said:—

"While travelling with a member of our society during an archaeological excursion, we had some conversation about the excavations going on in Chancery-lane, which stimulated me to look out for the remains of buildings that might have belonged to the Knights Templars, as the Knights Templars, according to various authorities, first established the chief house of their order in England without Holborn Bars, on the south side of the street, where Southampton House formerly stood, adjoining which Southampton-buildings were afterwards erected. A few years ago the ground east of Southampton-buildings was excavated, and at the back of the present London and County Bank the foundations of the circular church of the Knights Templars were visible; south-east of these remains I first noticed a strong wall, which the masons had some difficulty in picking to pieces. Then a chamber composed of chalk was exposed to view, the walls of which were 2 ft. in thickness, and the area 3 ft. by 5 ft. 9 in.; the depth, after some of the upper part had been removed, was then 6 ft. 2 in. On a higher level, a little beyond, were the remains of another chamber, indicated by the remains of tiled flooring. Underneath this floor was a deposit of unburned charcoal, which may have been purposely deposited as a landmark. These remains are south-west of the church, and from the quantity of animal bones of oxen, swine, and goats, the chalk chamber may have been a storehouse for salted provisions, and the tiled room a portion of the refectory of the Knights Templars. Excavations more due east and west may probably show better relics of the ancient monastery. The Order next purchased the Temple Church in A.D. 1185. After this removal the ground was disturbed for the build-

ing of Southampton House, and the chalk and stone remaining about the ground was utilised for its foundations. The diggings developed abundant remains of walls of red brick of this edifice. Southampton House has the interest of being the residence of the Right Hon. Henry Wriothesley, Earl of Southampton, and Baron of Titchfield, to whom William Shakespeare dedicated his sonnet of 'Venus and Adonis.' This house was afterwards the residence of Robert Atkinson, grandfather on the mother's side to Thomas Wentworth, Earl of Strafford (secretary to Charles I.), who was born here on Good Friday, April 13th, 1593, and was executed at the Tower of London, May 12th, 1641. These foundations appear to extend in an angle of 45°, one end in Southampton-buildings and the other towards Chancery-lane. They are in the form of two strong walls, the width of each about 2 ft. 6 in., and appear to have been a long room or corridor 35 ft. in width. The houses which have and are being pulled down were erected on this side about A.D. 1675. The old foundations were utilised to build on; so there were three foundations one on top of another. The pottery found is of different dates; some Mediæval, such as tiles and candlesticks, and others of the period of James I. and Queen Anne."

BUILDING PATENT RECORD.* APPLICATIONS FOR LETTERS PATENT.

Jan. 18, 1884.

1,686. W. P. Kelly, Mount Brandon. Apparatus for retaining in position window-blind rollers, &c.

1,690. J. D. Mackenzie, London. Sash-bars for roof lights, &c.

1,714. J. Girdwood, London. Fire-proof and artificially-cooled structures.

1,715. R. Stevens, Bromley. Three-bar system of glazing.

Jan. 19, 1884.

1,744. V. Skinner, and H. C. Board, Stokes Croft. Ventilation of horticultural houses and buildings.

1,753. E. Verity, J. M. Verity, and B. Banks, Leeds. Fasteners for casements, &c.

Jan. 21, 1884.

1,792. G. G. P. Brodie, Birmingham, and J. D. Prior, London. Fire-grates.

1,795. H. A. Phillips, York. Exhausting in ventilation, &c.

1,800. A. C. Smith, London. Exhaust chimney-top and roof ventilator.

1,807. J. Partridge, London. Window-blind fittings. (Comp. Spec.)

1,852. W. Harding, Exeter. Glazing green-houses, &c. (Comp. Spec.)

Jan. 22, 1884.

1,859. T. Trotman and J. Carter, Stroud. Raising or lowering window-blinds.

1,901. W. Kay, London. Dwarf window-blinds.

1,903. F. W. Smith, London. "Tallboys" for preventing down-draught.

Jan. 23, 1884.

1,960. S. Welman, Godalming. Water-closet apparatus.

1,976. W. P. Buchan, Glasgow. Ventilating apartments.

1,986. A. Thomson, Strathbungo, and R. Anderson, Glasgow. Chimney-cowls.

Jan. 24, 1884.

2,005. W. Scott, Glasgow. Heating-stoves.

2,012. W. J. Penny, Southend. Sash-pulleys.

2,018. B. Horton, Wolverhampton. Spring-raising draught-preventer for door bottoms.

2,034. W. J. Penny, Southend. Fitting window-sash weights, &c.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Jan. 22, 1884.

4,490. S. van Campen, New York, U.S.A. Decorative tiles. Sept. 20, 1883.

5,388. H. A. Goodall, London. Blinds for windows, &c. Nov. 15, 1883.

Jan. 25, 1884.

5,659. W. P. Thompson, Liverpool. Seal traps for wash-basins, water-closets. (Com.)

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

by A. Edwards, Ashbury Park, U.S.A.)
Dec. 6, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending January 26, 1884.

2,693. J. A. Meggin, Liverpool. Graining or ornamentation of painted or coloured surfaces. May 30, 1883. Price 4d.

The pattern required is formed in relief on a sheet of absorbent paper, which is laid on the freshly-coloured surface, and absorbs the colour on the parts in relief.

2,698. J. Waple, London. Chimney-tops and ventilators. May 30, 1883. Price 4d.

These have two sets of apertures in the pipe or tube placed at the top of the chimney or ventilator. The lower series are of a keyhole shape, and are covered with hoods closed at the top but open at the bottom, while the upper series are uncovered. Thus an upward draught is created.

2,733. J. Smith, Blackburn. Water-closets and apparatus connected therewith. June 1, 1883. Price 2d.

These have tipping basins, which, when sufficiently filled with water, capsize, and are emptied. (Pro. Pro.)

INTERNATIONAL HEALTH EXHIBITION 1884.

SIR,—There are many sanitarians in the provinces who think that the committee having the control of Group 3, "The Dwelling House," should have amongst its members some of the most eminent provincial authorities in addition to those of the metropolis.

For many years past the management of similar exhibitions (though on a smaller scale) seems to have been almost entirely in the hands of a few prominent London sanitarians.

It would be much more satisfactory to the class I represent, and, I venture to think, much more conducive to the complete success of the exhibition, if such representative men as the water engineer of Liverpool (Mr. Deacon), the consulting engineer of the Nottingham Corporation (Mr. Tarbotton), and the borough engineer of Birmingham, could be induced to take a prominent part in the management of Group 3, and in the judging of the exhibits.

SANITARY ENGINEER.

"A STORY OF CAPEL COURT."

SIR,—I was much interested in a paper called "A story of Capel Court," which appeared in the *Builder* for the 20th of last October (vol. xlv., p. 514), but beg you to contradict what is there said of Sir Giles Capel's tomb, namely, that it was "ruthlessly destroyed some forty-five years back." It was almost certainly destroyed in Cromwell's time, whose people fought near our church, and broke its statues in niches outside the tower; tradition says the pieces of the tomb were doubtless lying about, and Parmenter, the builder, had them. His son tells me that what he had was one whole side, about 5 ft. long and 2 ft. high, and some broken bits; none had any inscription. I have been collecting evidence on the subject ever since your paper came into my hands, about two months ago, through the good thought of a former servant, who had it by accident, and thought it would interest me. I am most grateful to her, and to you, for all means are now being tried in consequence, to get back our helmets, the pieces of the tomb, and the oak of the chancel roof, which was very massive and valuable. There was also a fine old oak chest, bound with metal, which we fear is beyond recall. As to the evidence with regard to the destruction of the tomb, it is this. Every one in the village who is over fifty, and has lived here from childhood, remembers the old church well, particularly the chancel, where two rows of schoolchildren sat; they are unanimous in saying that they remember two helmets, "soldiers' caps" most of them call them, hanging up on the chancel wall, touching it, as if on a little hook, one on each side, but no tomb, and they feel sure they should remember it; they tell me exactly what was in the chancel, and with their seats, two large pews, &c., there could have been no room for any more tombs than those still there, which are not raised above the level of the floor, and are now covered with tiles; one was a little raised, but was altered when the tiles were put down about fifteen years ago. I also wrote to the widow of the resident clergyman (Mr. Capell, the rector at the time, did not live here), and to a clergyman, a great authority on architecture, who was much here at that time, and protested very

strongly against the pulling down of the old church, and their evidence is to the same effect. Our church is to be improved this year, and we hope when it is re-opened to have our helmets back again. It was a great pity that Mr. Capell and Lord Essex let their ancestors' armour go, and allowed the very interesting church to be destroyed, but I believe the Earl of Essex is doing all he can now to repair as much of the mischief as possible, though the main part is irreparable.

Is it certain that all the helmets were those belonging to the Capells? Armour has often been dug up in the fields where the skirmish took place in the time of the Rebellion.

Braintree.

A. M. T.

VENTILATION.

SIR,—As a very considerable number of property-owners would like to ventilate their rooms if they had some authority as to the manner in which it should be done, I venture to ask you kindly to allow one or more of your readers to state what would be the best manner to ventilate say a dining-room, which has no special flue for the foul air extract, but only the ordinary smoke flue. At the same time short replies to the following, if not touched upon in the reply, would be of considerable help to us:—

1. Is a fresh air inlet, the air being taken from the outside at the same level as the inlet grating fixed in an elbow, of as much service as when the air is taken from the outside at the floor level, and taken up the wall for 6 ft. in an upright tube? My reason for asking this is that the tubes are very unsightly, but the elbow could be made an ornament?

2. Would a square $4\frac{1}{2}$ by $4\frac{1}{2}$ C. I. pipe taken up the house side, to say 4 ft. above the roof, be as effective as a flue built in the chimney stack?

3. Is there any good system of taking the foul air direct from under the ceiling to outside of the building on a level?

J. W.

NEW R.C. CHURCH OF ST. MARY, HOLME HILL, GREAT GRIMSBY.

SIR,—In your issue of the 19th of January last, we observed a paragraph stating that a new altar and reredos, recently erected in the above church by the Hon. Mrs. Fraser, was executed by Messrs. Boulton & Son, "the whole being from the designs of Messrs. Pugin & Pugin, of London and Ramsgate." &c.

Now, this is worded so as obviously by implication to lead to the supposition that Messrs. Pugin & Pugin were the architects of the church; while the edifice in question was actually incomplete and in our hands, Mr. Boulton (who executed the marble and stonework of the high altar from our designs) having declined to prepare a drawing when asked to do so by the late incumbent.

M. E. HADFIELD & SON.

Corn Exchange Chambers, Sheffield,
29th January, 1884.

THE CARPENTERS' EXHIBITION.

SIR,—Allow me, as a carpenter, to offer a remark upon the insignificant value of the prizes offered to exhibitors at the forthcoming competition. I will admit that the exhibition may not be without its value to us and to architects, but I do maintain that, considering the purpose for which the company was formed, its great wealth, and considering too the great trouble and expense the exhibitors will incur, the prizes are simply a reproach to the Company, and not a fair return for the workman's labour. The fact is, that some of our best tradesmen will be kept out of the competition because they cannot, in the present state of trade, afford to spend time and money in the production of models. I intend to submit a model which, with the drawings, will be worth 10l. Should I be successful (remote possibility!) I shall receive about half the value of my work and a medal. Would it not be fair to present the medal and a sum sufficient to cover the cost of the model? The Company would then be entitled to the models, which would form the nucleus of a permanent and instructive exhibition. Of course I shall be told that we ought to think of the honour attached to receiving a prize. Well, "can honour set a leg?"

HENRY DUNKLEY.

Female School of Art.—The Countess Granville has kindly consented to distribute the prizes to the students of the Female School of Art at Prince's Hall on the 5th February, in the place of the Duchess of Westminster, who has been unable to fulfil her engagement in consequence of the lamented death of Earl Grosvenor.

DEFECTIVE PARTY-WALLS.

SIR,—Permit me to draw your attention, and that of your numerous influential readers, to a danger which, at all events in suburban districts, is, I fear, waiting to add a great misfortune to dwellers in neighbourhoods distant from fire-engine stations. I condense the following cutting from a weekly newspaper, as it tends to show what thousands of persons are trusting to when a fire breaks out in their midst:—

"Early on Wednesday morning a serious fire broke out in — road. The shop was occupied by a boot and shoe maker. In consequence of the great distance between the scene of the fire and the station, the firemen found the premises in one mass of flame, and the front room above the adjoining shop (a large oil and colour store) had also taken fire through some defect in the party-wall. The house where the fire originated was completely gutted, and the damage done next door was also of a serious character."

You have aimed many a blow at such shoddy buildings, and if you will kindly find space for this instance of insecurity you will be doing another service to dwellers in what are termed houses, which everybody will be grateful for. Perforated party-walls make these jerry-built dwellings positive death-traps. ONE OPPOSED TO CREMATION.

A CLAIM FOR BRICKS.

JONES V. TRUNDLE.

THIS was an action (tried at the Essex Winter Assizes on the 25th ult. before Mr. Justice North) to recover 40l. for bricks sold and delivered. The defence was a general denial of liability. The plaintiffs, Messrs. S. Jones & Co., are brickmakers carrying on business at Southend, and from the opening statement of their counsel it appeared that in April of last year they supplied bricks to Mr. James Vine, who had a contract to build some houses at Clapton for the defendant, Mr. Francis Trundle. On the 19th of May Vine wanted a second freight of bricks, but the plaintiffs' agent refused to supply it without a guarantee of payment, and Vine thereupon wrote to the defendant, asking him to deduct from his (Vine's) accounts as they might become due sufficient money to pay to Messrs. S. Jones & Co. for the bricks supplied for the work. The plaintiffs also wrote to the defendant directing attention to Vine's letter. One or two other letters were written to the defendant on the subject, but no answer was received. Vine had become insolvent, and the money in the defendant's hands had been paid to the liquidator.

John Edwin Porter, the plaintiffs' agent at Southend, gave evidence as to the supply of the bricks to Vine, and as to the letter written to the defendant by Vine; on one occasion, he said, he saw Vine's letter in the defendant's hands.

James Vine, the builder to whom the bricks were supplied, confirmed the statements of the previous witnesses as to his having requested the defendant to pay for the bricks from his account, and said the defendant paid to the liquidator under his (Vine's) bankruptcy 250l. which he had in hand belonging to witness.

The defence to the action was, briefly, a denial that the letter from Vine requesting the defendant to pay the plaintiffs reached its destination, and further a denial that the plaintiffs' letters reached the defendant. The defendant, who was called in evidence, went into the witness-box, and stated that he did not receive Vine's letter or any letter from the plaintiffs until June 9, when he received one which he answered two days later. [This, according to the evidence for the plaintiffs, was the fourth letter sent to the defendant.]

The jury, without a moment's hesitation, found a verdict for the plaintiffs for the amount claimed, the foreman stating that they believed the defendant received Vine's letter.

His Lordship gave judgment for 40l., with costs.

ADDITIONS AT WATERLOO STATION.

IN addition to the successive enlargements which have been carried out at the South Western Railway Company's London terminus during the last few years, further works of a very extensive character are now in progress for the purpose of providing additional accommodation, more especially for the Windsor traffic. On the north side of the station, approached from York-road, a large block of buildings, three stories in height, and having a frontage upwards of 200 ft. in length, is on the point of completion. A considerable part of the ground floor of this range of buildings is intended for new booking offices, waiting-rooms, and other offices in connexion with the Windsor traffic, the future approach to the station for this section of the Company's traffic being exclusively from York-road. From the booking-offices a spacious platform, now in course of construction, is reached

This platform, running north and south, immediately to the west of the booking-offices and waiting-rooms, is 70 ft. in length and 36 ft. in width, supporting on iron columns and girders. The platform is in immediate connexion with an additional double line of rails now being laid on the north side of the present station area, this widening of the line being effected by the construction of a series of arches. The widening is intended to be continued westward to Clapham Junction, from which point, in the direction of Wimbledon, Wandsworth, Putney, and other districts westward, the doubling of the line is now nearly completed. In carrying out the widening of the line from Waterloo to Clapham Junction, Griffin-street will be crossed by a girder bridge, and between this point and Vauxhall the demolition of a very large number of houses and other buildings will be necessary, including the taking down of a portion of the Canterbury Music Hall, which was re-erected only a few years ago. Preparatory to the continuation of the work a large number of houses between Griffin-street and Westminster Bridge-road are now in course of demolition. The upper part of the new booking-offices is intended to be chiefly occupied by the company's engineer and his staff, whilst the basement, approached by a low level entrance in York-road, has already been taken possession of by the Government for parcels post-office purposes. The buildings are ultimately intended to be continued northwards to York-road, when they will have an entire frontage from north to south of about 320 ft., with a frontage in York-road of upwards of 250 ft.

The whole of the works are being carried out from the designs of Mr. Jacob, the company's engineer in chief, the contractors being Messrs. Perry & Co., of the Tredegar Works, Bow.

STAINED GLASS.

Barnack.—Two large windows in the south aisle of Barnack Church have been filled with stained glass, in memory of the late Rev. Marsham Frederic Argles, B.D., Fellow of St. John's College, Oxford, who died of the effects of jungle fever on his return from India in May last. The execution of the memorial was confided to Messrs. Heaton, Butler, & Bayne, of Garrick-street, Covent-garden.

Cropredy.—A stained-glass window of three lights has lately been placed in Cropredy Church, by Mr. John Allitt, as a memorial of his wife. The subject is the death of the Mother of the Lord in St. John's house at Ephesus. The Apostles are grouped round the bed in attitudes of prayer and sorrow, while the Beloved Apostle, to whose care the Blessed Virgin had been entrusted, stands by the head of the couch. The window closely adjoins a similar memorial erected by Mr. and Mrs. Allitt to their only child. The artist of both was Mr. Westlake, of the firm of Lavers, Barrad, & Westlake.

Leighford (near Stafford).—The east window in Leighford Church has been filled in with stained glass, representing the subject of the Crucifixion. The window is in memory of Colonel Eld, and was designed and executed by Messrs. F. Holt & Co., of Warwick.

Books.

A Digest of Patent Law and Cases, incorporating the Provisions of the Patents Act, 1883. By H. A. A. GRIDLEY, Barrister-at-Law. Marcus Ward & Co., London. 1884.

EVERY new Act of Parliament, which is of any wide application either in regard to law or trade, very soon produces a number of commentaries, great and small. This is one of the progeny of the Patents Act, 1883, and falls within the category of small commentaries. It is a handy and convenient work especially adapted in our opinion to the use of laymen, and useful also to those lawyers who do not require to go into the subject very deeply, or who are satisfied to have the Act, and the chief decisions laid before them, and to go more carefully into the reports of decided cases for themselves.

It is a well-proportioned book; the little historical introduction is a good beginning, the comparison of the new and old procedure which follows is interesting, and the main part which comes next is well done. The manner in which

Mr. Gridley arranges his materials may be shown by Chapter V., which is headed "The Complete Specification."

These words occur in several sections of the new Act, which are set out, and then follow a *precis* of a number of decisions, which throw light on the term "complete specification." We do not propose now to enter into a critical examination of the new Act; it is sufficient to give those of our readers who are interested in the subject our view of one of the works which touch upon it. The main objection which we have to Mr. Gridley's work is the fact that the Act does not appear consecutively anywhere either in the text or in an appendix. However useful such a book as this may be it always elucidates a subject if the Act can be given consecutively, because it is that which forms the main basis of the law, which, if a commentary is not used, is perused as it was passed. We feel Mr. Gridley's difficulty; to have put the Act in an appendix would have much increased the bulk of the book, as most of it already appears in the text. With the exception of this very important objection, Mr. Gridley's work, having regard to its aim, appears entitled to praise alone.

The Year's Art. Compiled by MARCUS B. HUISE, LL.B., and DAVID C. THOMSON. London: Sampson Low & Co.

THIS hand-book has now reached its fifth year of publication, and is certainly a very fine annual of its age. Its last year's growth has been prodigious, and it may fairly rank as the "Whitaker" of the artistic professions. It will be interesting to note what the industry of its compilers can find to add on its next issue. The only thing we can suggest is that out of 200 illustrations a few might have been devoted to the mother and mistress of all the arts. The little *fac-simile* prints, which, though of very various degrees of merit, certainly add a charm to this popular hand-book, have been taken from pen drawings lent by the artists, or at second-hand from Mr. Blackburne's "Notes." But architects now-a-days draw much in pen-and-ink, and exhibit their drawings at the Royal Academy. Are they churlish and refuse to lend their drawings? Or are their designs inartistic and unsuitable to publication? Our own opinion is that at no time for many years have our architects furnished more picturesque designs or more artistic drawings, and we have no doubt but that a selection therefrom would be found to fill quite worthily a page or two of "The Year's Art." We are the more surprised to note the present omission because the only article in the volume is a short *résumé* of the architecture of the past year; and the chief compiler of the hand-book, as editor of the *Art Journal*, always affords space in that journal for the treatment of architectural subjects. We have no space for an enumeration of the classes of information which the work comprises. It is a carefully-compiled epitome of all that an artist can desire to know about current art, and not the least of its many virtues is a capital index. It should certainly form a part of every architect's reference library.

Early and Imperial Rome. By HODDER M. WESTROFF. London: Elliot Stock.

THIS is a reprint of a course of lectures on the Archaeology of Rome, which were delivered on the sites to which they severally relate, and have now in their collected form been somewhat happily named "Promenade" lectures by the author of them.

They do not contain, and do not profess to contain, anything new on this old and ever-interesting subject. The writer of them has, of course, a personal knowledge of the matter whereof he treats, an acquaintance with the topography of the Eternal City, and an enthusiastic admiration for her art and history. But his work is not in any sense original, and gives little more than a *precis* of Parker and other previous writers, largely helped by extracts from Fergusson. We are glad to note on page 55 a true view about the alleged superiority of ancient mortar, viz., that its excellence is in the main owing to its mere antiquity. In spite of a popular prejudice, it is quite certain that no better mortar was ever made than is now daily made by our builders. A collection of masons' marks on the stones forming part of the Servian wall discovered near the railway station will be welcome to collectors of those devices. The book is illustrated but sparingly by a few woodcuts, and is in sad need of a map. It is

rather aggravating in the author to give us¹¹ his extracts from Fergusson that writer's letters^s of reference to his plan, and not to give the plan also. In the chapter on the marbles used in ancient Rome the author omits to note the fact that many of the choicest specimens came from Britain. On the whole, the book will be most valued by those who heard the lectures delivered amidst the scenes they describe, and who will find in it a pleasant *souvenir* of what was, doubtless, an agreeable archaeological outing.

Harper's Magazine. January, 1884. London: Sampson Low & Co.

THE current number of *Harper*, while maintaining its reputation as a magazine of general interest, has nothing specially addressed to architects, unless the editor's plaintive moan over the disappearance of ancient buildings,—their modernisation,—throughout the whole of Europe, may be said to specially concern architects. They have, no doubt, been sinners in their time in this connexion, but they are all saints now, and the "restorer" is anathema on all sides. The works of man's hands like man himself must have an end, and we should hardly care to see a zinc shed erected over any old house for its preservation, as the Hollanders are said to have preserved a house once inhabited by Peter the Great. The poetry of the dwelling could scarcely survive such conservatism. Mr. Weller was of opinion that if death were abolished the undertakers would suffer, and we may, in the interest of architects at large, indulge in a cynical acquiescence in the decay and disappearance of at least some buildings, even if ever so old.

MEETINGS.

FRIDAY, FEB. 1.

Architectural Association.—Mr. J. D. Crace on "Coloured Decoration." 7.30 p.m.

SATURDAY, FEB. 2.

Association of Public Sanitary Inspectors (1, Adam-street, Adelphi).—Mr. F. T. Poulson on "Procedure in Dealing with Nuisances." 6 p.m.

MONDAY, FEB. 4.

Royal Institute of British Architects.—Mr. William H. White (Secretary) on "The Education and Position of Architects in France since the year 1671." 8 p.m.

Society of Engineers (Westminster Town-hall, Caxton-street, Westminster).—Mr. Arthur Rigg, President, will deliver his inaugural address. 7.30 p.m.

London Institution.—Prof. Ruskin on "The Storm Cloud of the Nineteenth Century." 5 p.m.
Society of Arts.—Mr. Thomas Bolas, F.R.S., on "Recent Improvements in Photo-Mechanical Printing Methods: Type-blocks from Line-drawings and Half-tone Subjects" (Cantor Lecture). 8 p.m.

TUESDAY, FEB. 5.

Institution of Civil Engineers.—Mr. F. R. Cender, M. Inst. C.E., on "Speed on Canals." 8 p.m.

St. Paul's Ecclesiastical Society.—Mr. H. W. Brewer on "Galleries in Churches." 7.30 p.m.

Royal Institution.—Dr. Archibald Geikie, F.R.S., on "The Origin of the Scenery of the British Isles." 3 p.m.

WEDNESDAY, FEB. 6.

Society of Arts.—Mr. William Westgarth on "Suggestions for the Re-housing of the Poor, and the Re-construction of Central London." 8 p.m.

British Archaeological Association.—Mr. Alfred B. Wyon, F.R.G.S., on "The Seals of Henry VI. as King of England." 8 p.m.

THURSDAY, FEB. 7.

Royal Academy.—Mr. Reginald Stuart Poole on "Ancient Egyptian Architecture." 8 p.m.

Society of Antiquaries.—(1). Mr. Edwin Freshfield, F.S.A., on "A Deed of Gift to the Brethren of the Holy Cross, Reigate." (2). Mr. B. Edmund Ferrey, F.S.A., "Notes on the Parish Church of St. Catherine, Catherington, Hants." 8.30 p.m.

London Institution.—Mr. Norman Lockyer, F.R.S., on "The Last Two Eclipses of the Sun." 7 p.m.

FRIDAY, FEB. 8.

University College.—Prof. C. T. Newton on "The Obelisk at Xanthos." 4 p.m.

Royal Institution.—Mr. George J. Romanes, F.R.S., on "The Darwinian Theory of Instinct." 9 p.m.

SATURDAY, FEB. 9.

Architectural Association.—Visit to Houses in Harrington-gardens. (Messrs. Ernest George & Peto, architects.) 3 p.m.

Miscellaneous.

Speed on Canals.—A discussion is anticipated at the meeting of the Institution of Civil Engineers, on the 5th of February, on a paper by Mr. Conder, M. Inst. C.E., on "Speed on Canals." This paper, which is to some extent a continuation of the evidence given by the author before the Select Committee on Canals, is illustrated by tables of the chronology of river and canal legislation in England, from the year 1423; by plans and details of the sizes of canal locks; and by a statement of the various speeds attained and attainable on canals, with the retardation caused by locks, lifts, or inclined planes, per foot of rise. It is also illustrated by large-sized sections of the Suez Canal, as the same was authorised by the Concession, and also as it has been actually constructed, together with sections showing how the accommodation demanded by the traffic of the world can be best provided. The writer gives mathematical rules for the loss of speed due to the restricted area of canals, and also as to the influence of depth upon the movement of vessels, whether in restricted channels or in the open sea.

Filters.—The Silicated Carbon Filter Company send us drawing and description of a filter they have just patented, the special characteristic of which is the employment of the filtering medium in the form of a flat, circular, movable block, a section of a cylinder, fitting inside the chamber of a cylindrical stoneware filter on a metal supporting frame, which can be lifted out in a moment whenever it is desired to change the block of filtering carbon for a new one. On lifting out the block, the whole interior of the filter chamber becomes exposed, and can be inspected and cleaned if necessary. The invention seems a very useful one for rendering it easier to change and clean the filter and keep it in that purity of condition without which a filter is worse than useless. Square carbon blocks are supplied, when required, with the filter. The carbon, it may be observed, is made impervious to water at its top and sides, so that the water is forced in at the bottom and made to take a longer and more circuitous course through the filtering medium than if it only filtered vertically through.

A New Public Hall at Clapham.—Opposite the Clapham Station of the London, Chatham, & Dover Railway, in Garden-road, a new public hall is nearly completed. From the main entrance in Garden-road a corridor, 6 ft. in width, leads into a spacious reception-room, whence access is gained to the hall itself, which is octagonal in form and about 60 ft. in diameter, containing a ground area of upwards of 3,000 superficial feet. It is 25 ft. in height from the floor to a handsome coffered ceiling, supported by ornamental iron columns. In the centre of the ceiling there is a spacious lantern, the hall being also lighted by windows on the east side. At the west end there is a stage or platform occupying the entire width of the area, retiring and dressing rooms being provided immediately under it. The hall, which will seat about 600 persons, has been erected from plans by Mr. Bamford, architect, Camberwell.

The Late Dean of Windsor.—A handsome memorial has just been erected at Chertsey Cemetery in memory of the late Dean Connor, Chaplain to her Majesty the Queen. It is executed in marble, and is in the form of an Irish cross, carved on the front with the eucharistic lily, palm, and a wreath of laurel. The work has been executed by Messrs. Underwood & Sons, of Duke-street, Grosvenor-square.

Croydon.—Alterations and additions are proposed to be made at the Brighton-road schools to accommodate about 300 more children, making a total accommodation for 846. A large portion of the fittings will be dual desks. The architects are Messrs. Berney & Monday, of Croydon.

A Large Clock has just been erected in Hammerwich Church, near Lichfield, by Messrs. John Smith & Sons, Derby. It is fitted with all the latest improvements, strikes the hours, and has one 4-ft. dial. The same firm are making a turret clock for a mission church at Norfolk Island.

The Stone for the New War Offices.—On this subject, on which a correspondent made some suggestions last week, we have received some interesting and important letters, which, for want of space, we have been obliged to defer to next week.

Proposed Exhibition at Buda-Pest, 1885.—In connexion with the "General National Exhibition" to be held at Buda-Pest next year, under the auspices of the Hungarian Government, it has been determined (in consequence of the limited character of the Exhibition, which is intended to produce as complete and faithful a picture as possible of the productions and handicrafts of Hungary) to organise simultaneously a separate International Section for "motors and working machines, tools, and implements for artisans, and agricultural machinery and appliances of all kinds. The General Commission have been induced to take this step because, to use their own words,—

"The greatly improved means of communication, and the great increase of international intercourse, have exposed Hungary to the competition of the more advanced foreign industry; on the other hand, a very important tendency has appeared, for raising industrial establishments on a very large scale, by the more intensive application of the powers of nature, and a more extensive employment of the principle of division of labour, which tendency is thrusting the smaller artisans rapidly into the background. With regard to the wholesale production of cheap manufactured goods, not only is it a pressing necessity, but perhaps the most important problem of the political economy of our times, to find ways and means of saving the smaller industries from certain extinction, to preserve and advance the material welfare of craftsmen, by enabling them to fill up the place in the circle of industrial productions which the large manufacturing establishments, wanting in individual character and bent on only wholesale production, are unable to occupy. In order to solve this highly important question of political economy, it is essentially requisite to put into the hands of intelligent and assiduous craftsmen such motors or perfected working machines and tools as are at the disposition of the wholesale producer, or that the methods and implements used by the wholesale producer may be so modified as to be used by handicraftsmen, and put into motion as easily and cheaply as by the wholesale manufacturer."

The General Regulations for the International Section of the Buda-Pest Exhibition (which is to be opened on May 1, 1885) may be had from the Office of the Special Committee, Buda-pest, Hungary.

Builders' Clerks' Benevolent Institution.—A special general meeting of the donors and subscribers of this institution was held at the office, 27, Farringdon-street, on Tuesday evening last, Mr. J. Howard Colls, president, in the chair, when John T. B. Miles, the only eligible candidate, was duly elected by show of hands as a pensioner on the relief fund. The committee afterwards, at Mr. Colls's invitation, adjourned to partake of supper. During the evening, Mr. E. C. Roe, on behalf of those present, acknowledged the services rendered by Mr. Colls to the charity, and concluded by proposing his health. The president, in reply, expressed the pleasure he felt at meeting the members of the committee, and of the satisfaction it had afforded him to be associated with them in the work of assisting so good an institution, and referred especially to the presence of Mr. T. F. Rider, of whom he spoke as having been a most active president, and as he might say the "resuscitator" of the Institution. Mr. Rider in reply said, he was very pleased to be present to meet the president, who was a worthy son of a former worthy president (alluding to the late Mr. Benjamin Colls). He also referred to other presidents who had rendered good service to the charity, speaking especially of Mr. Taprell Holland and Mr. Stanley Bird. He also expressed the hope that more of the builders clerks' themselves would join so excellent an institution, which was founded especially for their benefit.

Society of Engineers.—The first ordinary meeting of this Society for the year 1884 will be held on Monday next, at the Westminster Town Hall, Caxton-street, Westminster, when the statement of accounts for 1883 will be read; the president for 1883, Mr. Jabez Church, will present the premiums awarded for papers read during that year; and the president for 1884, Mr. Arthur Rigg, will deliver his inaugural address.

Nottingham Municipal Buildings Competition.—It appears that we were not technically correct in describing Messrs. Verity & Hunt's design as "described." It was "unanimously recommended" for execution by the Committee. The Corporation postponed the further consideration of the whole subject on grounds, as we understand, apart from the merit of the design.

The Constant Water Supply Question in St. Pancras.—A crowded meeting was held on Tuesday evening last, the 29th ult., in reference to the expensive demands of the New River Company, some particulars of which were given in our last number. Mr. Westacott took the chair, and gave an interesting account of the correspondence between the Vestry and the water company, contending that the Company's requirements were totally unnecessary, arbitrary, and at variance with the powers of their Act. He estimated that the cost of carrying out the requirements would be 10,000l. Mr. Robinson, who in the vestry had advocated the constant supply, considered the New River Company had not fulfilled their part of the contract, for having compelled each house to be fitted with every appliance that was deemed necessary two or three years ago, they had not sent in the constant supply, and now turned round and demanded further outlay. He contrasted the conduct of the West Middlesex Company with that of the New River Company, one of the wards of the parish having had the constant supply from the former company without any of the vexatious expense or irritation to which the other parts of the parish were subject. Other speakers addressed the meeting, and eventually a deputation was appointed to confer with the Vestry, and wait upon the directors of the water company to induce them to withdraw or modify their requirements. In the meantime it was agreed that no steps be taken to comply with their demands.

Electrical Engineering.—The fourth of a course of lectures on "Electrical Engineering," by Mr. J. C. Fell, was delivered on the evening of January 28, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Jabez Church, past-president, in the chair. The lecturer again resumed the description of the principles on which the generation of currents is obtained from dynamo-electrical machines, giving large scale illustrations of the various methods in which the armature coils may be wound. He then explained in comparative detail the distinctive characteristics of the best known dynamo machines, such as the Gramme, the Siemens, and the Edison machines, which were illustrated. Mr. Fell then proceeded with definitions of the laws of circuit resistances directly proportional to length and to sectional area of conductor, and gave some interesting examples of electric arc lamps, dating back as early as 1816. The defects in these lamps for practical lighting purposes were pointed out, and the steps of invention effecting mechanical improvement thus explained.

Manchester.—The trustees of the Manchester and Salford Savings Bank are now erecting a new branch bank in the Oldham-road on a site a little more than a mile from the head office in Booth-street, Manchester. Of the old buildings on the ground, a portion has been pulled down to make way for the new bank; and the remainder is being adapted for a caretaker's residence. The material for the bank-room is brick outside and in, with stone dressings, a superior and costly description of brick being used for the interior. An open arched winding staircase leads from the bank to the book-room in the basement and up to a gallery, where, screened from observation, yet within ear-shot and eye-shot of the depositors, a clerk may retire for his luncheon or tea. The bank is expected to be ready for occupation and business by Midsummer next. Mr. Thomas Scott is the contractor, working under the direction of the architects, Messrs. Medland & Henry Taylor.

St. Paul's Mission Hall, Surrey Gardens, Walworth.—The above Hall, for the Rev. Evelyn F. Alexander, Chaplain to the Bishop of Rochester, in connexion with St. Paul's, Lorrimer-square, was opened by the Bishop of Rochester on the 24th ult. The building will seat about 800 adults, and has cost 2,400l., including heating apparatus, gas fittings, reversible seats, wood block floors, &c. The builders are Messrs. H. Burman & Sons, of 37, De Laune-street, Walworth, and the architects Messrs. Romani-Walker & Tanner, of 19, Buckingham-street, Adelphi.

Notice of Removal.—Mr. James Hill, whose lock furniture has long been in such high repute in England and in many parts of the Continent, is removing this week from Upper Thames-street to new premises, at 100a, Queen Victoria-street.

Building Improvements in the "New Cut," Lambeth.—A new building is being erected in the Lower Marsh, otherwise the "New Cut," Lambeth, for Mr. Grove, clothier and outfitter. It has a frontage to Lower Marsh of 83 ft. in length, with a return frontage to Robert-street of 60 ft. The height of the building from the pavement-line to the cornice is 60 ft., and to the ridge of the Mansard roof 75 ft. It contains five floors, the upper floor having ornamentally carved pediment and arched dormers. The elevations are of white Suffolk brick and Portland stone, with terra-cotta bands carried across the frontages immediately under the dormers. The ground and first floor of the building contain spacious show-rooms, each having an area of nearly 5,000 superficial feet. The estimated cost of the building when completed is about 10,000. A portion of the structure is already finished and opened. Mr. Vicars, of Adde-street, City, is the architect, and Mr. E. Lawrence, of the City-road, is the contractor.

The Heating and Ventilation of the German Parliament House.—Competition is invited for plans for warming and ventilating the new buildings of the German Reichstag. Foreigners, however, need not trouble themselves in the matter, for the competition is confined to German sanitary engineers. A sum of 10,000 marks has been set apart for premiating the three best designs. The plans of the successful competitors become the property of the State.

TENDERS.

For stabling at High-street, Bromley, for the London General Omnibus Company. Mr. J. T. Lambam, superintendent of works:—

Rayner	£1,750 0 0
Gregory	2,840 0 0
Jackson & Todd	3,690 0 0
Lake & Co.	3,328 0 0
Hack	3,344 0 0
Foster & Dicksee	3,333 0 0
Haynes	3,250 0 0
Shurmer	3,240 0 0
Holding	3,437 0 0
Smith	3,212 0 0
Richardson & Munt	3,112 0 0
Walker	3,077 0 0
Garrell	3,030 0 0
Evans	3,235 0 0
Howell & Son	3,000 0 0
Parker	2,979 0 0
Garratt	2,831 0 0
Scharien & Williams	2,915 0 0

For the erection of new schools and office at Trafalgar-square, Stepney, for the School Board for London. Mr. E. B. Robson, architect:—

Harris & Wardrop	£15,550 0 0
Scrivenor	14,940 0 0
Bangs	14,899 0 0
Patman & Fotheringham	14,735 0 0
T. Boyce	14,750 0 0
W. Johnson	14,730 0 0
C. Wall	14,621 0 0
C. Co.	14,599 0 0
Kirk & Randall	14,470 0 0
Atherton & Latta	14,310 0 0
Ferry & Co.	14,157 0 0
J. & Son	14,154 0 0
W. Brass	14,134 0 0
G. S. Williams & Son	14,111 0 0
S. J.	13,989 0 0
Wall Bros.	13,934 0 0
Mark Gentry	13,917 0 0
F. & F. J. Wood	13,669 0 0
W. Shurmer	13,590 0 0

For bank premises at Ventnor, Isle of Wight, for the Capital and Counties Bank. Mr. Theodore R. Saunders, architect. Quantities by the architect:—

J. Crook, Southampton	£3,797 0 0
T. Jenkins, Newport, L.W.	3,550 0 0
A. Ditch, Ventnor	3,500 0 0
G. Hayles, Shanklin	3,267 0 0
H. Ingram & Sons, Ventnor	3,180 0 0
J. Newham, Ventnor	3,120 0 0
Elms & Russell, Ventnor	3,100 0 0
Edisbury & Kinswell, Ventnor	2,916 0 0
Isaac Barton, Ryde	2,749 0 0
Drudge & Wheeler, Ventnor	2,735 0 0

* Accepted.

For additions and repairs to Tiv Works, 27, Freeman-street, Birmingham. Mr. Edgar Farman, architect and surveyor. Quantities by the architect:—

William George (accepted)	£150 0 0
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For reinstating premises, for Messrs. Culmer & Son, Horseay-road, Mr. J. Ezer, architect and surveyor:—

Wilkinson Bros.	£69 10 0
Southcott & Co.	59 17 8
J. Harper	57 10 0
Gibbs & Imber	57 9 0

For works in erection of offices, Crouch End Station:—

Southcott & Co.	£195 0 0
Gibbs & Imber	175 7 8
Wilkinson Bros.	159 0 0
Morland & Co.	145 0 0

For alterations to the Egyptian Hall, Piccadilly. Mr. James Geo. Buckle, architect:—

D. Lang & Son	£1,230 0 0
Whitley	969 0 0
Sea, child & Son (accepted)	940 0 0

For the erection of the superstructure* of Cannon-street buildings, Cannon-street and Abchurch-lane, Mr. Geo. Sherrin, architect. Quantities by Messrs. Franklyn & Andrews:—

Corder	£12,840 0 0
Lowatt	39,870 0 0
J. & J. Greenwood	37,783 0 0
Rider & Son	37,060 0 0
Dove Bros.	36,595 0 0
Lawrence & Son	36,512 0 0
Bywater	36,337 0 0
Ashby & Horner	36,270 0 0
Holland & Hannen	35,813 0 0
Ferry Co.	35,808 0 0
Peto Bros.	31,741 0 0
Ashby Bros.	35,528 0 0
Brass	35,333 0 0
Kirk & Hamphill	33,332 0 0
Chappell	32,884 0 0

* The basement and sub-basement have been carried out by Messrs. Holland & Hannen.

For underpinning walls, and building in of iron brashers for new lights, and excavating for new basement, offices, and areas, and various alterations at 7, Angel-coat, and Throgmorton-street, for Mr. R. B. Gregson. Messrs. Geo. Barnes Williams, Frederick-place, Old Jewry, and E. A. Gruning, architects, Gresham House:—

Howell J. Williams, Bermondsey-street (accepted at schedule of prices)	£263 0 0
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For erecting villa-residence, Queen's-road, Wimbledon, for Mr. J. R. B. Pead. Mr. S. B. Grosvenor, architect, No. 23, Southampton-row, Holborn:—

Craske	£834 0 0
Burman & Sons	834 0 0
Oldis Bros.	825 0 0
Johnson	825 0 0
J. Anley (accepted conditionally)	820 0 0

For extra work in laying surface-drains, and kerbing New-road, South Wimbledon Estate, for the directors of the Birckbeck Freehold Land Society. Mr. S. B. Grosvenor, surveyor:—

Found (accepted)	£225 0 0
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For alterations at the Albion Hotel, Ludgate-circus, for Mr. T. Parker. Mr. H. I. Newton, architect:—

Royal	£635 0 0
Canning & Mullins	615 0 0
Beale	590 0 0
Mills	580 0 0
Goldson	575 0 0
Cook (accepted)	571 0 0

For alterations and repairs at the Corner Pin, St. Martin's-lane, for Mr. C. Deakin. Mr. Arthur W. Saville, architect. Quantities supplied:—

Royal (accepted)	£345 0 0
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For the extension of pavilion for the Matlock Bath Pavilion and Gardens Company, Limited, at Matlock Bath. Mr. John Nuttall, architect, Matlock. Quantities by Mr. F. S. Smith, St. Anne's-square, Manchester:—

Chadwick & Co., Rotherham (accepted)	£1,250 0 0
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For the erection of Wesleyan Chapel and schools at Cleethorpe, Great Grimsby, Lincolnshire. Mr. Chas. Bell, architect. Quantities by Mr. Henry Lovegrove, No. 26, Budget-row:—

Hobson	£5,989 0 0
Mills	5,906 0 0
Spencer	5,673 0 0
Mashford	5,647 0 0
Holmes	5,065 0 0
Grant & Co.	4,983 0 0
Baines	5,000 0 0
Snowden	4,856 0 0
Fletcher	4,817 0 0
Thompson	4,400 0 0

For new schools, for the Brighton and Preston United District School Board, Circus-street, Brighton, for 700 children. Mr. T. Simpson, architect, Ship-street, Brighton:—

Bruton, Brighton	£6,730 0 0
Cheesman & Co., Brighton	6,390 0 0
Stimpson & Co., London	6,236 0 0
Longley, Crawley	6,347 0 0
Webber & Co., Hove	6,234 0 0
Brown, Burgess Hill	6,203 1 0
Peters, Hoveham	6,123 0 0
Wright, Brighton	5,596 0 0
Creswell, Hove	5,974 0 0
Hudson, Kearsley & Co., Brighton	5,032 18 9
Reynolds, Jun., Hove	5,810 0 0
Taylor, Brighton	5,783 0 0
W. & G. Davey, Brighton	5,698 0 0
Dean, Brighton	5,670 0 0
Charlwood Bros., East Grinstead	5,245 9 0

For the erection of new schools and offices at Colla-road, Peckham, for the School Board for London. Mr. E. B. Robson, architect:—

Turtle & Appleton	£12,804 0 0
W. Sheppard	12,318 0 0
W. Tongue	12,293 0 0
J. Grosvenor	12,267 0 0
W. Scrivenor	12,250 0 0
J. Marsland	12,247 0 0
Patman & Fotheringham	12,213 0 0
Ladley	12,200 0 0
W. Brass	12,194 0 0
Bangs	12,190 0 0
Kirk & Randall	12,147 0 0
Hy Hart	12,140 0 0
C. Wall	12,090 0 0
Wall Bros.	12,085 0 0
W. Down	11,957 0 0
W. Shurmer	11,970 0 0
Stimpson	11,910 0 0
Jas. Smith & Son	11,764 0 0
S. J. Jervard	11,659 0 0
W. Johnson	11,423 0 0

For the erection of house in Addison-road, Kensington. Mr. Edward Monson, Jun., architect, Grosvenor House, The Viceroy, Acton:—

Scharien & Williams, South Kensington	£2,294 0 0
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* Accepted.

For the erection of a block of buildings for aged and infirm inmates, on the Cook's-terrace, &c., adjoining the workhouse, for the Guardians of the Poor of the Parish of St. Pancras. Mr. H. H. Bridgman, architect, 42, Poultry, Quantities by Messrs. Sandall & Corderoy, and Mr. W. T. Farthing:—

H. Hart, Great Dover-street	£36,853 0 0
Longmire & Burge, St. Pancras	34,990 0 0
G. Shaw, Westminster	34,335 0 0
Higgs & Hill, Lambeth	34,420 0 0
W. D. Fink, Gray's-Inn-road	34,085 0 0
J. Joselyne, Borough	33,960 0 0
J. T. Chappell, Pimlico	33,662 0 0
Lucas & Son, Kensington	33,227 0 0
Mowlem & Co., Westminster	32,945 0 0
Steed Bros., St. Pancras	32,998 0 0
Perry & Co., Bow	32,918 0 0
B. E. Nightingale, Lambeth	32,728 0 0
E. Toms, St. Pancras	32,634 0 0
E. C. Howell & Sons, Lambeth	32,550 0 0
C. Killingbeck, St. Pancras	32,297 0 0
T. Boyce, Hackney	32,140 0 0
R. S. Lambie, St. Pancras	32,000 0 0
Foster & Dicksee, Rugby	31,999 0 0
W. Sonvener & Co., St. Pancras	31,981 0 0
J. Woodward, Finsbury	31,645 0 0
W. Shurmer, Clapton	31,690 0 0
J. & J. Greenwood, City	31,573 0 0
M. Manley, St. Pancras	31,327 0 0
Wall Bros., St. Pancras	30,973 0 0
Kirk & Randall, Woolwich	30,720 0 0
W. Brass, City	30,597 0 0
E. Lawrence & Son, City-road	30,448 0 0

* Accepted subject to references, &c.

For the Aule Maxima for the joint use of the Episcopal Residence and Seminary in Edinburgh-road, Portsmouth, for the Rev. Dr. Virtue, R.C. Bishop of Portsmouth. Mr. Joseph Stanislaus Hanson, architect, 27, Alfred-place West, South Kensington. Quantities by Mr. Henry Smith, 8, John-street, Adelphi:—

Patman & Co.	£2,632 0 0
W. Newman	2,490 0 0
Barbridge	2,455 0 0
M. & E. Evans	2,450 0 0
J. Butt	2,408 0 0
J. Tverman	2,336 0 0
W. Ward	2,273 0 0
Light Bros.	2,298 0 0

For making up Alroy-road, Finsbury Park, for the Horsey Local Board. Mr. T. de Courcy Meade, surveyor:—

Dunmore, Crouch End	£213 9 6
Pizzey, Hornsey	195 0 0
Jackson & Son, Finsbury Park	189 0 0
Strachan, Wood Green	174 13 8
Salomon & Co., Harrow-road	170 0 0
W. T. Williamson, Green Lanes	169 0 0
G. Impey, Leytonstone (accepted)	147 17 8

For erecting iron roofs, &c., for the Alum and Ammonia Company, at their works, Atlantic Wharf, Bow. Mr. E. W. Mountford, architect:—

Mr. J. T. Newman, architect	£1,634 0 0
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* Accepted.

For the erection of a block of school buildings for 965 children, caretaker's residence, and appurtenances, on a site at the Custom House, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. Curtis & Sons:—

G. J. Hoskings	£10,068 0 0
J. Castley	9,968 0 0
W. Grogan	9,960 0 0
Hearle & Son	9,594 0 0
J. Holland	9,570 0 0
J. Brickell	9,440 0 0
J. J. Robson	9,427 0 0
E. Stafford	9,263 0 0
Magee & Co.	9,185 0 0
D. D. & A. Brown	9,180 0 0
J. G. Horlock	9,115 0 0
B. E. Nightingale	9,068 0 0
E. H. Hunt	9,065 0 0
J. Parfitt	8,989 0 0
C. Cox	8,877 0 0
A. Reed	8,700 0 0
Priestley & Gurney	8,700 0 0
Howell & Son	8,614 0 0
North Bros.	8,160 0 0
J. W. Hobbs	7,869 0 0

* Accepted subject to approval by the Education Department.

For business premises, stabling, &c., for Messrs. H. & G. Duffield, Upper East Smithfield. Mr. J. Butterworth, architect:—

C. Sharpe	£27,500 0 0
J. Garrick	6,900 0 0
Foster & Dicksee	6,000 0 0
Harris & Wardrop	4,994 0 0
B. T. Wood	4,839 0 0
S. Blow	4,703 0 0
E. Stafford	4,659 0 0
D. King & Son	4,537 0 0
Scharien & Williams	4,433 0 0
Perry & Co.	4,429 0 0
Parker	4,339 0 0
Ford & Everett	4,300 0 0
W. J. Hack	4,299 0 0
J. Gouthwaite	4,193 0 0
W. Marriage	4,150 0 0
Jackson & Todd	4,091 0 0
Bolding	4,087 0 0
H. T. Dye	4,035 0 0
W. Shurmer	3,960 0 0
Gibbons	3,950 0 0
Howell & Son	3,923 0 0
Gerrard	3,879 0 0
G. White	3,848 0 0

For the erection of a truant school at Fyfield, near Ongar, Essex, for the West Ham School Board. Mr. J. T. Newman, architect, No. 2, Finsbury, Fenchurch-street. Quantities supplied by Messrs. Curtis & Sons:—

J. W. Hobbs (reduced estimate)	£27,775 0 0
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* Accepted.

The Builder.

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SATURDAY, FEBRUARY 6,

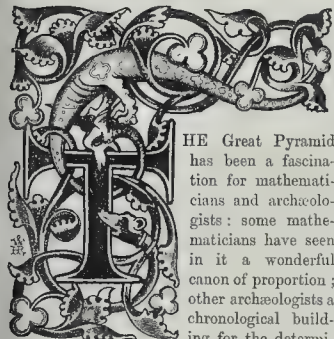
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The Pyramids of Gizeh.*



THE Great Pyramid has been a fascination for mathematicians and archaeologists: some mathematicians have seen in it a wonderful canon of proportion; other archaeologists a chronological building for the determination of the historical epoch of the earth's history. The reason of its origin to ordinary minds is, of course, evident, and its approximate proportions easily attainable; but that is not sufficient for the supersubtle minds which see through millstones, or raise the baseless fabric of untenable hypotheses. Like the exact area of the circle, and the bisection of the circle or the law of parallel lines, the lovers of paradoxes find a recondite meaning in its chambers, passages, and proportions. The code of directions drawn up by Professor Piazzi Smyth has been carried out, although it is doubtful if the results are those anticipated by Mr. Smyth.

A portion of Mr. Petrie's work is devoted to the description of the instruments used in the operation of measurement; the reasons of this are given,—that the fittings have to be experimented on, and trials made before they are used, and that the observer has better chance of correcting errors by practically dealing with them. After all, the theodolite, the plumb-line, and the measuring-rod, and the extreme care to ensure reliable instruments, conducted no doubt to minute results. The only wonder is how the Egyptians produced such results, as no very fine tools have come down to the present day; the results obtained by the ancient Egyptians could not have been due to the theodolites or theories, consequently it cannot be considered that this minute measurement throws any light upon the question.

The excavations of Mr. Petrie were carried on by shafts and casings found at the north-eastern and western sides; these casings were found all in good condition at the Great Pyramid. Similar operations were carried out at the Second and Third Pyramids, some new points were here discovered, and in the rubbish some pottery of the age of Cheops, of the

fourth dynasty. A minute examination was made of the lengths and heights of the chamber, and especial attention given to the so-called coffer or sarcophagus, which has been supposed to be a kind of inspired standard measure of capacity by former inquirers; but, considering its mutilated condition, it is only a standard of capacity of those intellects that hold so untenable a proposition. The length of the cubit used in the King's Chamber of the Great Pyramid gives a mean of 20.632 ± .004 in. The masons' marks give 3 cubits for 65 in. or 21.666 in., rather more than the average drawn from the King's Chamber,—a proof, if any were wanted, that the Egyptians did not use the unerring accuracy that has been supposed in their constructions. At the second period, beyond the wall of the peribolos, are the large barracks of the workmen discovered by Mr. Petrie. They are of pieces of limestone, buried in mud, with the floors of the galleries of mud. These barracks would hold about 4,000 men. In the *débris* here were found fragments of statues in diorite and alabaster, and scraps of pottery of a contemporaneous period. In the interior of this pyramid the chief interest was the coffer, better made than that of the Great Pyramid, and the ingenious mode by which the lid was secured by an undercut groove and pins. It appears that a good deal of crystallised salt exists in the interior,—all that remains of the mummy, whatever that may have been, placed inside it. The adjustment of the granite porticulis also exhibits great dexterity in moving heavy weights in a confined space.

The Third Pyramid, it appears, had no platform, but at a later age of the Roman period a considerable village grouped around it. This pyramid is admitted to have been enlarged after the first plan had been laid down, an important fact in considering the mode of construction. The smaller pyramids of Gizeh are not considered of great interest, no hypothesis about the object of their construction being connected with them except the historic doubts and confusion caused by the divergent opinions as to the founder of the third, started by classical authorities. The wooden coffin found in it resembles in style of art the monuments of the twenty-sixth dynasty, or B.C. 600.

The question of the orientation of the pyramids has also been touched upon to prove that it coincides with the change in the earth's axis, as shown by recent observation. The actual difference is 4' west of north, at the rate of 1' per 1,000 years: this would give about 4,000 to 5,000 B.C. for their date. The orientation must, however, have anciently been made by the Pole-star, which inquirers have supposed to have been seen from the passage of the Great Pyramid, and the Pole-star has

shifted, owing to the precession of the equinoxes. But the Egyptians at this period have not left any record of the Pole-star, and the texts of the pyramids of the sixth dynasty mention Sirius and Orion, but not the Pole-star. Still the accurate way in which their sides face the due north shows a long previous experience derived from observations, and is most remarkable, considering the early appearance of solar myths. The west or east would have naturally appeared more suitable for the openings of the tombs. On the pyramidia which capped the later tombs of the Theban necropolis the sides which faced are indicated by the presence of Ra and Tum, the rising and the setting sun.

Passing from the question of the orientation, Mr. Petrie gives a description of the granite temple, the only existing one which remains of the age of the old kingdom. This he supposes to have been cased with limestone; it measures about 140 ft. in each direction, by 40 ft. high; the roof was supported by massive stone pillars, square and monolithic. All the doorways were provided with double folding-doors, with pivot holes cut in the granite. The open-air court atop was reached by a sloping passage of alabaster, cased with limestone. The temple had no inscriptions to attest its origin, but recent discoveries show that it was not built before the reign of Khafra, and it was connected by a causeway that led up to a similar temple, which stood before the Second Pyramid, in addition to which statues of Khafra were found in it. Besides the granite pyramid, traces of other buildings were found about the Great Pyramid.

The other pyramids were also examined by Mr. Petrie. At Abu Roash he found, amidst the broken-up fragments from a granite sarcophagus or coffer, the remains of a diorite statue, inscribed with the titles of a king called Men . . . ra, probably one of the monarchs known as Menkara or Mencheres. The inscriptions of the pyramid of Pepi at Sakharah, published in the Transactions of the Society of Biblical Archaeology, it appears, were supplied by Mr. Petrie; the inscriptions were painted in bright green upon the white limestone. The diorite statues, fragments of which were found in the rubbish round the Great Pyramid, were also coloured white, but the alabaster ones had their draperies coloured green, and this colour appears to have been a favourite one at the time of the fourth and subsequent dynasties. The other pyramids have only been cursorily examined by Mr. Petrie, whose researches do not materially add to the knowledge of their construction.

It appears that there has been no perceptible change in the climate in historic times; there exists one gargoyles at Memphis to catch any

* The Pyramids and Temples of Gizeh, by W. Flinders Petrie. 8vo. London: Field & Tuer, 1883.

chance rain that might fall, the accumulation of sand went on at all times. The pyramid of Abu Roash is the only granite-cased one besides the Third, and must have been built about the same dynasty. No collateral evidence has yet been found to show how early the granite quarries of Syene were worked before the fourth dynasty. The question of the identity of Khufu and Khnum Khufu has long been settled, the fact being that the names of this dynasty are all prenoms, and that while the other names, such as Khafra and Menkaure, had the name of the sun, Ra, in their composition, Cheops or Suphis selected Khnum, the name of the deity of Elephantine, with whom he had some relation. By analogy this name should be Khufu-Khnumu, with the inversion, and the meaning appears to be "He who is protected by Khnumis"; but it is difficult to determine in all cases the sense of prenoms, besides which the diadem title of both names is the same. The Third Pyramid was, no doubt, the work of Menkaure, of the fourth dynasty. That he was a son of Cheops is impossible, as the long reigns of Cheops and Chephren required for the construction of the Great and Second Pyramids, and their extreme old age, prevent the possibility of Mencheres being his son. The step pyramid at Dashour may be of the time of the eighth dynasty.

No additional light is thrown upon the age of the Sphinx to what is already known; as it has no inscription its age period depends upon archaeological criteria, such as the appearance of the Sphinx in art, and the first instance of the head-dress *klafit*. It does not appear earlier than the twelfth dynasty.

Although Mr. Petrie is against what is called the "accretion" theory that pyramids grew with the length of the king's reign, the theory seems the most tenable hitherto advanced. Of course, subsequent monarchs may have finished the work of their predecessor after it had attained unfinished dimension, and even possibly have used it for their own interment; but there is a mystery about the burial-places of the early Apis. Belzoni found the bones of a bull or a cow in the Second Pyramid.

The chapter on the mechanical means by which the Egyptians carved hard stone is most interesting; and although it may be doubted if the Egyptians knew diamonds, it is evident that they used some of the harder stones. It is unnecessary to say that no tools of the kind have been found or depicted, and that granite is supposed to have been stunned by bronze chisels and mallets, and then faced by conical maulers or polishers. Mr. Petrie has, however, found traces of bronze saws and tubular drills, and the cores of stone in some instances remaining. He also thinks that there is strong evidence of circular saws and lathes, but the question depends on the traces left of the work, and in some instances these are unequivocal. Leaving aside the diamonds, Mr. Petrie has solved some of the difficulties about the mechanical resources employed by the ancient Egyptians, no traces of steel having been found. The theory of the object of the pyramids is temperately and fairly investigated by Mr. Petrie, but the one adopted by Egyptologists is that they were tombs, and it is confirmed alike by inscriptions, coffers, and bodies. That they were "inspired" works is not in the domain of science, but of "theology," and unsound; it has arisen from the restricted chronology considered to be necessary for such theologies as can believe in nothing historic older than B.C. 4,000, and which makes it a matter of faith that the pyramids were built about B.C. 2,000.

Mr. Petrie enters into the question of the organisation necessary for the building of the pyramids; he supposes, following Herodotus, 100,000 of the *corvée*, 4,000 of whom he considers to have been skilled masons, who would prepare 120,000 average blocks. These were trimmed and then moved by rocking with crowsbars, but Perring is said to have found plug-holes in the masonry, by which the blocks were raised from tier to tier, so that the steps formed the scaffold for its construction.

The pyramids have excited so much attention at all periods that the interest in them remains undiminished. Mr. Petrie's measure-

ment will, probably, remain as the canon of their measurement, as the care in the details is unrivalled. It may be doubted if the extreme minutiae of measurements were in the minds of the Egyptians, and if they did not work by the rule of thumb, but the work of Mr. Petrie, is one of mathematical precision and of science. The history and archaeology of the period have been long investigated, and there is little to add till accident reveals some contemporaneous monuments throwing light upon the subject. The principal facts eliminated are the numerous population required for the manual work, the high accuracy in details possessed by the workmen, and the plans of the builders and architects, and the political organisation of so remote a period.

THE FRENCH INDUSTRIAL CRISIS AND THE BUILDING TRADES.

The industrial crisis in Paris has become the subject of a prolonged debate in the National Assembly, and the facts adduced, and the problems involved, have more than local interest. Many trades are affected, but the crisis is doubly serious where it touches the building trades; first, because of the extensive interests involved, and, secondly, on account of the dangerous political action of the workmen thrown out of employment. Anything like authentic figures it is always difficult to obtain, especially in so complex a community as that of a large metropolis. M. Jules Ferry estimates the number of men employed by the building trades of Paris at only 120,000, and therefore attributes the crisis not so much to the excessive number of workmen, as to exaggerated speculation in building. M. André Cochut, in the *Revue des Deux Mondes*, states that building material to the value of about 60,000,000*l.* has been brought into Paris within the last few years. Adding to this the cost of land, which has doubled, and the increase in the rate of wages paid, he considers that from 200,000,000*l.* to 250,000,000*l.* have been spent for building purposes within the last five or six years. But this production was not only excessive, it was, to use M. Ferry's words, "badly planned and badly executed." There is a plethora of high-class residences, while the construction of artisans' dwellings has been entirely neglected. M. Th. Villard, in a report drawn up for the Municipal Council, calculates that, while the population of Paris has increased during the last seven years at the rate of 15 per cent., that of furnished and low-class lodging-houses has augmented at the rate of 80 per cent., though the number of these workmen's dwellings rose only to the extent of 20 per cent. Thus great over-crowding has ensued, and the price for the accommodation that does exist is exorbitantly high.

The actual falling-off in the building trades may be judged by a few municipal statistics. For instance, the taxes paid in 1882 for the creation and maintenance of roads in front of new houses amounted to 1,319,000 francs, while in 1883 this tax only yielded 654,000 francs. Again, the number of permissions granted by the Prefecture of Police for the building of stories to houses in course of construction has fallen from 120 or 150 per week to sixty or seventy per week. Nevertheless, M. Ferry is of opinion that the crisis in the building trade is not so acute as it might be; and, for all consolation, prophesies that matters will be very much worse in 1885. According to the accounts given by the *Crédit Foncier*, there still remains building work on hand estimated at 4,000,000*l.*, while the carpenters' and joiners' work for something like 6,000 stories or flats built during the course of last year has yet to be done. It is when all these enterprises already commenced are completed that the crisis will become most acute. To meet this gloomy outlook the French Premier can only suggest the active prosecution of public works. In this respect, at least, there will be no falling-off. If necessary, supplementary credits will be demanded to push forward the reconstruction of the Sorbonne and *École de Médecine*. In the estimates for the Budget for 1884 public buildings in Paris are put down

at 465,440*l.*, and the town has increased, rather than reduced, its expenditure in this respect. Thus on the maintenance and construction of streets, roads, &c., 2,800,000*l.* were spent in 1883, while 2,960,000*l.* are set down for the same service during the current year, and the number of labourers, &c., employed for this work will be increased from about 20,000 to 24,000. If the projected metropolitan railway was built or artisans' dwellings erected, or if the schemes for enlarging the Pont d'Austerlitz, the Rue des Filles-Dieu, the approaches of the Corn Market and the Palais Royale, were carried out, something like 8,000,000*l.* would be devoted to building purposes, and such undertakings would prevent the still greater crisis that otherwise must ensue in 1885.

Such, in a few words, is the official version of the economical crisis, so far as the building trade is concerned; and this view,—these suggestions for the future,—will doubtless be accepted by the majority among capitalists and middle classes. Nevertheless, and to do full justice to the question, we should also inquire what those who are the first to suffer have to say on the subject. The workmen themselves have not failed in this crisis to make their voices heard, and to formulate a programme of action by which they believe present evils might be remedied, and their recurrence avoided. Several Parisian trade unions have associated themselves together for the purpose of investigating the matter, and have presented a report to Parliament which we hope and believe is far from exact, at least, in its statistics. The tendency to exaggerate permeates all classes in France; but those who are the least educated naturally accentuate this national failing. The trade unionists, however, in their organ, *Le Proletaire*, state that house-carpenters and joiners employed in the building trade of Paris number, in prosperous seasons, almost 30,000. Of these, 8,000 are believed to have left the capital in despair; 15,000 are out of work, and among those who are employed half the workmen are foreigners. This decline in the trade is attributed, in a measure, to the importation of foreign woodwork. A window-frame can now be obtained all ready-made from Norway, and it does not cost more than the charge made in Paris for the mere work of hand. The number of stone-cutters in prosperous times is also estimated at 30,000, but there are now only 15,000 remaining, and of these barely a third are able to find employment. Among the masons, only 15,000 out of about 40,000 contrive to work. The difficulty with respect to these figures arises from the fact that they in no wise agree with the estimate given by the Premier. M. Jules Ferry, we have seen, considers that the building trades employ only 120,000 men; while the trade unionists declare that only one in four are at work, and reckon the number of men unemployed at 150,000.

In spite of this contradiction in the estimate of the amount of suffering, there can be no doubt but that the crisis is sufficiently serious to compromise the prosperity,—even the safety,—of the city. The Government, however, does not propose any remedy beyond the general encouragement of public works. With the workmen, on the contrary, the wildest schemes are freely discussed, and there is a dangerous tendency to believe in the power of legislation to cure economic evils. Nearly all French workmen, who are not indifferent to such matters, are socialists; but there is a great variety of forms of socialism, and the term does not generally involve revolutionary ideas. The largest section, on the contrary, of organised working-men have at last come to the conclusion that their ideal can only be attained by the slow process of evolution. There remains, however, a small minority of turbulent agitators who still rely on violence, and think it possible to establish socialism on the morrow of a sanguinary revolution. Among these the house-carpenters and joiners have played a prominent part. It was from their corporation that the anarchist delegate Tortelier was sent to the International Trades Conference recently held in Paris. These

anarchists, aided by some revolutionary collectivists, succeeded at recent meetings in passing resolutions repudiating all attempts at reform and legislation, and calling upon the people to prepare for an immediate and armed revolution. If anything was wanted to accentuate the present commercial depression, such meetings are well calculated to achieve this purpose. Fortunately, all who are acquainted with French working-class movements know that the Anarchists and Impossibilists are an infinite minority. Nevertheless, they sometimes carry with them workmen and others who have no experience in political organisation and action, and who, as in the present crisis, when so many artisans are suddenly thrown out of employ, attend public meetings for the first time. The real strength of French labour organisation will be found with the members of the *Fédération des Travailleurs Socialistes de France*. This is the party which organised the International Trades Conference; and its partisans are known as the Possibilists on account of their comparatively moderate and practical doctrines. They urge that such a crisis as the present would be avoided by more energetic action on the part of the State, and the development of greater strength among the trade unions. The State or the Municipality should, they insist, build workmen's dwellings, and open stores for the sale of meat, bread, and articles of primary necessity. This would establish a wholesome competition with private enterprise and speculation; for the State would sell at cost price. All public works, they claim, should be given to trade corporations and not to private contractors or speculators. But these corporations are too weak, in many instances, to carry out such enterprises, and hence the proposal of a subsidy of 1,000,000*fr.*, to, as it were, endow the trade unionism of Paris. To Englishmen, and even to many English trade unionists, this suggestion will seem preposterous. But workmen in England have for long enjoyed absolute liberty and freedom of association. In France, the Bill which is to render trade unionism legal has not yet been definitely adopted by the Legislature. On the other hand, the French Government did on one occasion give a much larger sum to relieve small tradesmen during the exceptional depression of the year 1848. What was done for small shopkeepers might also be done for artisans. A gift of money by the State to the French trade unions might be considered in the light of a compensation for the unfair position in which they have been placed by the denial of the right of association.

Another important phase of the question has also been brought forward. The present depression is in part due to the great number of foreign workmen who have thronged to Paris, and undersell native labour. M. Jules Ferry treats this grievance with a light heart. If foreigners come in such large numbers it is because France is, after all, a happy and favoured country. So fortunate are the French, that they will no longer do the meaner class of work, and are, therefore, glad to call in the Italian and the Belgian. There is undoubtedly much truth in this. In the South of France all the navvies are Italians, and in the north this is also very frequently the case. But the grievance does not end here. In all trades, even those where the greatest skill is required, and notably in every branch of the building trades, foreigners, especially Belgians and Germans, undersell the French artisans. Actually at the new central post-office, now in course of construction, out of forty painters and house-decorators, only five are genuine Frenchmen. Under these circumstances the Socialists argue that a law should render it illegal to employ foreign workmen to undersell native labour, and that foreigners should be paid according to the custom of the trade, or according to established tariffs, but in no case less than what was given to Frenchmen for the same class of work.

Such is the general character of the ideas and proposals which the present depression has helped to bring forward; and as the building trades are largely involved, both in the industrial depression and in the socialistic agitation resulting therefrom, the crisis deserves special

notice at our hands. Before the present agitation ceases many interesting and technical subjects will be discussed, and perhaps some practical experiments attempted. The question of the housing of the poor is involved, together with the possibility of State intervention in such matters. The practicability of co-operation among workmen in the carrying out of large building enterprises is also at issue, while the struggle between the rival doctrines of individualism and of State socialism meets us at every step. It must be acknowledged, therefore, that the difficulties now besetting the Parisians have raised problems of no ordinary interest and difficulty.

THE ASSYRIAN DEPARTMENT OF THE BRITISH MUSEUM.

THE prolific nature of the harvest of antiquities which has resulted from the explorations of Mr. Rassam in Assyria and Babylonia has necessitated a considerable expansion of the Assyrian department in the British Museum, and also a complete re-arrangement of the antiquities exhibited. The removal of the natural history collections to South Kensington placed the fine suite of rooms on the north side of the British Museum at the disposal of the Keeper of the Department of Oriental Antiquities, and Dr. Birch, aided by his two assistants, Mr. T. G. Pinches and Mr. Ernest Budge, have now succeeded in producing order out of the hitherto chaotic confusion of Assyrian, Egyptian, and Phœnician antiquities in this section of the Museum. The galleries, which have now undergone the long-necessary re-arrangement, and are now open to the public, are the Koyunjik Room on the ground floor, in which are exhibited the sculptures and inscribed tablets obtained by Sir Henry Layard in 1849-50, Mr. Rassam during his several exploring campaigns, and Mr. George Smith in 1873-4; as well as a new Assyrian Room upstairs, in which a special selected series of typical examples of the Assyrian treasures of the British Museum is placed on view. By the adoption of a definite system in the work of re-arrangement the authorities have conferred a great benefit upon all students of Oriental art and antiquity,—as well as the casual visitor to these galleries, in that for the first time since their arrival in this country the Assyrian antiquities adapt themselves to a consecutive and systematic study. The works of Mr. Fergusson in England, and MM. George Perrot and Chipiez in France, have done much to prove the importance of the study of the art of Assyria and Babylonia to those who would understand the origin of Western art, while each day the labours of the small band of Assyriologists are bringing out more and more evidence showing the importance of Assyriology to the student of philology, mythology, and the history of civilisation. The claims of Assyrian remains being thus asserted it is all the more important that the material upon which they are based should be so arranged as to admit of both consecutive and departmental study. To aid the student in the study of the collection from Nineveh exhibited at the Koyunjik Room, Dr. Birch, with the assistance of Mr. Pinches, has prepared a small descriptive handbook.* The work is based on the model of that prepared by Dr. Birch for the Egyptian collections, and is a great improvement upon the former meagre account of this section embodied in the General Guide to the British Museum, a wondrous encyclopedic production. The historical introduction to this guide-book, from the pen of Mr. Pinches, is certainly the most concise *résumé* of the history of the dual empires of Mesopotamia that has yet appeared, and indicates in a striking manner the great accession to our knowledge of the remote past, resulting from the discoveries of the last five years. The columns of the *Builder* do not admit of a review of this important section, but it may

be admissible to say that the theory as to the situation of the land of Cush which Mr. Pinches puts forward (p. 3) is one which will receive but few adherents among his brother Assyriologists, nor will it be accepted by students of Oriental and Biblical history, while the account of the Pantheon and religion is certainly not up to the standard of recent researches; and the symbols of the gods,—a most important branch of art,—are quite neglected. The description of the sculptured slabs arranged on the walls of this gallery coming from the south-west palace at Koyunjik, the greater portion of which was built by Sennacherib (B.C. 704), is from the pen of the Keeper of the department. A description of these various tableaux is no doubt a great gain to the visitor, who is unable to understand the various incidents depicted there, but we doubt if the long and prosy enumeration of petty details of dress, accoutrements, and natural features here given will not prove too much for the patience of the most studious visitor. We have in the *Builder* more than once pointed out the true position occupied by these sculptured or graven tableaux, as forming a series of folio plates illustrative of the narratives inscribed upon the obelisks, cylinders, and tablets. In these latter we have the descriptions from which the artist compiled his picture, and it is by these that they should be interpreted to the student of modern times, as they were in times past to the subjects of the great king. The value of such aids to the understanding of the artist's work cannot be too highly estimated, and consequently they should be utilised more than they are in the present edition of the guide-book. This may be exemplified in the case of the first series of slabs (Nos. 3, 26) here exhibited, which represent the wars against Merodach-baladan. Full details of these wars are found in the Taylor and Bellino cylinders, supplemented by numerous reports and despatches. Extracts from these, supplemented by such local details as might have been gathered from the works of Layard and Loftus regarding the marsh-land of Gambulu, the modern El Afadj, in which the fugitive prince is represented as hiding, would have done much to show the great historical value of these tableaux and the inscriptions which illustrate them. The same applies to the explanation of the slabs (Nos. 34, 40, 44, 50) illustrating the Elamite wars of Assurbanipal, a full description of which is found in the cylinders found by Mr. Rassam and the report and epigraph tablets. The series of sculptures exhibited (Nos. 51, 56) which represent the building of the palace of Sennacherib at Nineveh, will always be of great value, as showing the mode in which these great edifices were constructed, and the various kinds of manual labour and mechanical aids employed by the Assyrians in their public works. These we see depicted here in a most vivid manner, and a description of the work, an epitomised specification of the work, is found in the above-mentioned cylinders, and on the Nebly Yunus tablet at Constantinople. In Assyria, as in Egypt, the *corvée* was the chief source of manual labour. The *corvée* employed in the construction of this palace, we are told by the king in his inscriptions, was composed of bands of men selected from the various colonies of Aramean, Phœnician, Jewish, and Babylonian captives, and even Cyriot-Greeks (*Yathanaï*). In these sculptures we see vividly all the worst features of forced labour, such as we are familiar with at the present time in Egypt; and such as have always accompanied the exercise of this power by the rulers of the East. Such scenes as we have here may be compared with their Egyptian parallels in the tombs of Ti and Rameses at Sakkarah, or the beautiful tomb of Thothotpu recently removed to Boulak, where the *Ka* (edion) statue of the deceased is being dragged to its resting-place in the *mastaba*. The gangs of diggers are busy on the mound, while long lines of basket-carriers ascend and descend the mound with earth and rubble to build the mound, the work being superintended by "the master-builder" and a guard of soldiers. The removal of the great winged bull shows that the Assyrians, like the Egyptians, knew the value of the

* Guide to the Koyunjik Gallery. Printed by order of the Trustees, 1883.

inclined plane and the lever; while on one of the towers adjoining the river a man is hauling up a bucket of water by means of a pulley. We thus see that three of the mechanical powers were known to the builders of Assyria. The inscription over the king's chariot, on the last slab of this series (No. 56) reads:—"Sennacherib, King of Multitudes, King of Assyria, had the bulls and colossi, divinities which had been made in the land of Baladua for the palace of his lordship, which is within Nineveh, set up with joy." The land of Baladua was situated in the Zagros Mountains, and was the chief source of the white marble and gypsum used by the Assyrian sculptors and architects. It is evident that the sculptures were merely roughed out in the quarry and finished when *in situ*. The bull here has no feathers or beard, and the great bulls flanking the chief gate of Nineveh uncovered by Sir Henry Layard were found to be unfinished. In the centre of the gallery are a series of six table cases containing smaller objects of interest. The first case (A) contains the finest specimens selected from the large collection of engraved cylinder and other shaped seals. These objects are of the highest importance to the student of Babylonian and Assyrian art. As in Greek and Roman art we find the chief sources of mythological and symbolic art on the coins and engraved gems, so are these early samples of the lapidary's art the chief sources for the illustration of the legends of Assyria and Babylon. Here we have the artistic representations of the labours of Ishubar or Ninrod; his struggle with the lion (Nos. 8 and 32), as Hercules slew the Nemean lion, or the great bull of Heaven (Nos. 13, 49), the counterpart of the Cretan Minotaur. The Chaldean Noah, *Shanous napsist*, "the Sun of Life," in his ark (No. 49), the scorpion men who guarded the Sun (No. 38), and the deeds of Heabani, the satyr-like companion of Ishubar, which form incidents in the Epic of Ishubar, are all illustrated in those gems. Other seals contain representations of the worship of the Sacred Tree, of Fire, and the Sun and Moon, and one of the most interesting from a historical point of view, is the signet of Darius Hystaspes, with its trilingual inscription in Persian, Median, and Babylonian (No. 3). The stones most used in early times were green jasper, crystal, amethyst, ironstone or hematite, grey and blue chalcedony, and carnelian. As the series of seals here exhibited extends over a lengthy period from the earliest to the latest days of the empire, so the work varies. The early work is little more than deep-cut drawing, the joints being indicated by round holes, while in some of the later examples (Nos. 32, 26, 13) great skill has been attained in the representation of the muscles, hair, and features. The Babylonians, like the Egyptians, as shown by Mr. Flinders Petrie, in his work upon the Pyramids of Gizeh, used the diamond-drill for their lapidary work. The next two cases (B and C) contain fine specimens of the terra-cotta books of Assyria, the Creation and Deluge tablets, and a series of grammatical tablets. In case D are a number of the historical tablets, cylinders, &c., from which the description of the sculptured slabs may be compiled. On one side of this case are a selection of the commercial and legal tablets, sales of houses and land (Nos. 30, 44, 45), of slaves and merchandise. The contracting parties to some of these transactions being Jews and Syrians, the tablets have written upon them endorsements in Phœnician or Aramean (Nos. 29, 43, 45). Two cases at the end of the room (E, F) are devoted to bronze implements. The arrangement of this room is a great improvement upon the former one, and enables the visitor to gain some idea of the various classes of objects composing the Assyrian collections. It would add greatly to the value of the guide-book if a plan of the room were added to the few autotype plates which illustrate the work. The new Assyrian room, which contains a fine series of objects illustrative of the art and architecture of the dual empire, will be described in a subsequent notice.

NOTES.

An amusing and highly typical letter by "Ouida" appeared in the *Times* a few days ago, written in reply to a request that she would join in opposing an extension of the Skipton and North-Eastern Junction Railway over Aysgarth Force. "Ouida" thinks that railways are projected by "contractors," and to her excited imagination earth is full of contractors going up and down seeking for beautiful spots through which to run a railway, for pure wantonness. Then the railway is to cross Aysgarth Force "on skew arches," and it has been settled by "Ouida" and her compeers that there is something in a skew arch peculiarly hurtful to the higher instincts of humanity. But the best of the letter is the utter want of perception of the supply and demand aspect of the matter. "Ouida" thinks it wrong that railways should be made through beautiful spots merely because they pay; she forgets that they will only pay because people in the district want them. She undertakes to assure the world that the farmers there cannot want a railway. Does "Ouida" seriously suppose that directors (not "contractors," Ouida) expend money in a new railway project without ascertaining first whether they will get a return for it? And whence does she suppose they look for the return? Let "Ouida" and her anti-railway allies go round among the inhabitants of the threatened district, and get them all to sign a paper saying that they do not feel the want of a railway, and will not purchase a single ticket on it if it is made, and they may rest secure that the railway company will trouble them no more. As to the wholesome sneer at a system of locomotion which has done more to advance civilisation, and has called forth more healthy human energy and ability, than anything else in modern times, such feelings are only the product of ignorance and narrow-mindedness. The work of railway engineers has had, to say the least, a more wholesome influence on society than the tawdry sensational literature to which "Ouida" herself has so largely contributed.

Under the title "The Possibilities of a Revived Industry," *Harper's Magazine* for this month contains some remarks on the prospects of the use of terra-cotta in American architectural design, and two or three illustrations of what has been already done. An engraving of one of the windows of the Art-Museum at Boston shows what a direct influence South Kensington has exercised there. The style is more Gothic, the arches being pointed, but otherwise the first impression is that it is a bit from one of the inner cortices of the Kensington Museum. The only building in the States which has been carried out entirely in terra-cotta, as far as external design is concerned, is the building for the Long Island Historical Society at Brooklyn, which is referred to as recently erected. The architect's name is not given. Among the novelties of American spelling we notice "bass-relief" instead of "bas-relief," a very awkward and illogical innovation.

Messrs. Gouffé & Co. have on view at present Lefebvre's life-size figure, entitled "Psyche," which was in last year's *Salon*, and is a good example of the school of which he has been the most eminent exponent, and which aims at combining the study of the nude with the expression of poetic feeling in the figure. Psyche sits on a rock looking over a dreary leaden sea, a casket in her hand, a star on her forehead, a mass of hair falling down over her shoulders; the face has a very pathetic and spiritual expression. There is something not quite satisfactory in the modelling of the feet and of the legs, which seem too long from knee to ankle, and the figure generally is not powerful as a figure in regard to drawing. It is very fine in colour, and there is an imaginative character about the whole conception which renders it a very interesting work.

We may return to the subject of Sir J. Bazalgette's presidential address the other day

at the Institution of Civil Engineers (see p. 53, *ante*), to comment on the remarkable appendix which is annexed to the printed abstract of the paper. This includes forty pages of sanitary statistics, collected from the five quarters of the world. Some of the details are of startling novelty. Thus it will be new to most of our readers that Genoa has two and a half times, and Turin six and a half times, as many inhabitants per house as are to be found in Pekin. Yet the death-rate of Pekin is twice that of Turin. With the exception of Christiansia, which has a death-rate of 20.4 per 1,000, and a density of 23.5 persons per house, London is the healthiest city out of forty-five which are tabulated. The death-rate is 20.4, and the number of persons per house 8. Turin has 65.5 persons per house, and a death-rate of 25.1. There is no very apparent connexion between death-rate and numbers, either per house or of the entire city. Delhi, with 5.6 persons per house, has a death-rate of 47.86 per 1,000, among its 173,393 inhabitants; while Rome, with 27 persons per house, has only a rate of 26.1, among 304,458 souls, and Paris, with 29 persons per house, has the nearly equal death-rate of 26.3 among its 2,240,000 inhabitants.

The Institute of Architects have recommended the presentation of the Royal Gold Medal this year to Mr. Butterfield. In choosing for this honour an English architect who is not a member of their own body, they have acted in a liberal-minded and dignified spirit, and we hope one effect of this may be to induce some of the architects who stand high in the profession, but are not in the ranks of the Institute, to reconsider their ways and join hands, and, instead of standing aloof and idly complaining that the Institute is not truly representative of the professional ability and artistic culture of the day, to endeavour themselves to assist in rendering it more so, which would certainly be the more chivalrous as well as the more practical course to pursue.

The passing of the Metropolis Water Bill by the Examiner for Standing Orders is calculated to increase the perplexity with which that tribunal is regarded by all who are interested in promoting, or in opposing, new public works. The object of the Standing Orders of Parliament we take to be mainly twofold, viz., to prevent any vexatious trifling with the public in the way of inviting subscriptions, and to prevent any surprise to the owners of property, by giving them ample notice of what is proposed to affect them. To this end Clause 3 provides for notices of application to amend or repeal any former Act; Clause 17 is yet more explicit to the same effect; and Clause 36 provides for the delivery of an estimate of the expense of the undertaking to be lodged by the 31st of December. The Metropolis Water Bill of this year by Clause 4 proposes to amend or repeal all the Acts of the Water Companies by which their rates are now regulated; and by Clause 18 it seeks to appropriate to dividend the chartered real property of the New River Company. Yet the Examiner is reported to have found that this was not an alteration of any statutory provision for the benefit of the Companies requiring notice under the Standing Orders.

From the *Gazette des Architectes* we learn of the creation in Paris of a "Société des Amis des Arts Parisiens," having much the same objects as our "Society for the Preservation of Ancient Buildings," though to be conducted, we trust, with less zeal (in one sense) and more knowledge. The Society includes painters, architects, politicians,—whoever are interested in the preservation of the monuments of Old Paris, though, in the list of members of the committee of organisation (not yet filled up) the architects greatly predominate. The association proposes, however, to include other arts besides architecture under its care, and is thus distinguished from the "Commission des Monuments Historiques," the objects of, at the least, the operation, of which would, probably, be considered by our

English Society as of a hostile and nefarious character; but, as no such insinuation is made against them, we may presume that the new French association is swayed by more rational and less prejudiced counsels than those of the cognate English Society. The secretary of the Paris Society is M. Normand, to whom inquiries may be addressed at the Cercle Historique, which has been placed at the disposal of the Committee as their headquarters for the present.

The drawings sent in competition for the Pugin Travelling Studentship were exhibited at the last meeting of the Institute, and were to be seen during subsequent part of this week, in the Arbitration room on the ground-floor at Conduit-street. There were seven competitors: Messrs. Sankey, A. B. Pite, Strong, Edwards, Simon, Kemp, and Sirr; the first-named gentleman being the successful competitor. The drawings sent by Mr. Sankey and Mr. Pite are unquestionably the best sets of the series; the general average of the other work is fairly good. For reasons which we need not specify, but which some of our readers will understand, we prefer to decline giving any detailed criticism of the sketches, or any direct opinion as to the decision of the Council; merely observing, to prevent misunderstanding, that our reticence is not to be construed as implying any kind of censure on the award.

The Lower Thames Valley drainage scheme appears to be exciting an opposition which we imagine to be more according to zeal than according to knowledge. At the Meeting of Inquiry held at Kingston on the 6th inst., there were counsel representing various private landowners, the East Molesey Local Board, the Thames Conservators, the Commons Preservation Society (what their *locus standi* was we cannot make out), and forty-seven rowing-clubs, all in opposition to the scheme, as calculated to spoil the Thames for recreation purposes. The matter is, no doubt, a serious one and demands careful consideration on every side, but it is certain that something must be done with the drainage of the Lower Thames Valley district. No alternative plan seems to be proposed, and we are inclined to believe that the alarm raised is, at least, much greater than is actually called for. "Effluent" has become a disagreeable sounding word with disagreeable associations; but, as a matter of fact, the chemical and mechanical purification of sewage has been carried so far now that we doubt whether those who are so much alarmed on the subject would really know when the effluent was turned into the Thames if they were not told. They had better get fuller information, and consider the subject more calmly, remembering that "effluent" is, at all events, a far less deleterious addition to the river than gross sewage, the influx of which is at present being winked at by the law, simply because there is no doing anything else with it.

On dit that the Wellington statue is to go by safe and easy roads to Aldershot, and be set up on a site overlooking the North Camp. This is perhaps the best destination that has been proposed for it. From its colossal size, the statue would be out of scale with any site surrounded by buildings on which it might be placed, while on an open space this difficulty will be got rid of. We have all along said that to melt down the statue, which, whatever its defects, was modelled from the living man and the living horse, would have been a mistake; and it is gratifying to hear of a site being found for it, which will be unexceptionable in regard to association, and about the best-circumstanced site in regard to effect.

We regret to have to note that the Parkes Museum of Hygiene is in danger of succumbing for want of funds to keep it in operation, unless the Council can obtain at an early date some more definite and liberal support towards the cost of carrying it on. Such a museum is so valuable, in these days of experimental sanitation, as a centre for the exhibition of methods and materials, and still more as a

suitable and convenient place for the delivery of lectures on sanitary subjects, in which capacity it is needless for us to observe how well it has recently been made use of, that it will not be creditable to our day and generation if the Museum is allowed to be closed from no deficiency on the part of its managers, but merely for want of practical interest in it on the part of the public.

The Council of the Institute of Architects have sent a circular to the former winners of the Pugin Scholarship inviting them to compete in designing a medal to be presented to all Pugin students, past and future. The only suggestions are that an inscription, which should form part of the design, should, "in some fashion," clearly state the objects of the medal; that if a shield be adopted as part of the design, the Pugin motto, "*En avant*," must be introduced, and that the words "Pugin Travelling Studentship, founded 1864," must be on the obverse or reverse of the medal. The size is fixed at 2½ in. diameter. Surely a bas-relief portrait of Pugin would be a very suitable feature in such a design; the rather as Pugin's ardent, courageous, and chivalrous character falls in so fitly with that manner of commemoration. In that case, however, the judgment of a sculptor should be called in before making the award.

JOHN HENRY PARKER. IN MEMORIAM.

ONE more familiar figure has quitted the stage, having played well his part in life's great drama. At Oxford, on the last day of last month, somewhat suddenly, but quite peacefully, full of years and of honours, died the subject of this brief memoir. The grave must not close over one who has done so much for art without a sympathetic tribute from our pen. As an antiquary and archaeologist working in a somewhat restricted field, he has left but few superiors, and his presence will henceforth be painfully missed at our congresses; and so too will that fund of archaeological and architectural lore which was always at the service of his many friends.

Mr. Parker's fame will probably rest most popularly upon his first literary work, the well-known "Glossary of Gothic Architecture," published in the very earliest years of the "Gothic revival," now nearly half a century ago. There are few living architects who will not gladly own that a very large proportion of their knowledge of Gothic architecture was gathered from the pages of this the earliest, and in many respects the best, work on the subject.

It was Mr. Parker's good fortune to be associated in the production of the "Glossary" with such draughtsmen as Blore and Delamotte, and such an incomparable engraver of architectural drawings as Orlando Jewitt; and it may be doubted whether any subsequent work of the kind has been embellished by more faithful or artistic renderings of examples of English Mediaeval art.

Following the "Glossary," at an interval of thirteen years, Mr. Parker published his "Introduction to the Study of Gothic Architecture," a handy volume, based in some degree upon his earlier work. The completion of Hudson Turner's "Domestic Architecture of the Middle Ages" next engaged his attention, and these works, with an edition of Rickman's "Gothic Architecture," together with a multitude of contributions to antiquarian and other periodicals, provided constant employment for his active mind and facile pen.

For many years Rome absorbed almost all his interest, and his courageous and persistent exploration into the secrets of the early history of the Imperial City were not unrewarded with success. He succeeded, at least to his own satisfaction, in vindicating the historical accuracy of the legends which had previously only been regarded as "legendary." On this his favourite theme his opinions were apt to harden into dogmas, and he grew a little impatient of controversy and contradiction. The list of his works on this subject, headed by his well-known "Archæology of Rome," is a long one, and he has left others "in the press." The King of Italy decorated him with the order of SS. Maazilio e Lazaro, expressly for

having "demonstrated" the truth of those incidents in the city's history which had heretofore been regarded as merely fabulous. Pope Pius IX. hailed him as a "benefactor of Rome," and awarded him a medal. Foreign societies were liberal in their recognition of his services to history and art. He was made an Hon. M.A. of Exeter College, Oxford, and Keeper of the Ashmolean Museum; and, what was more prized by him than all—his own gracious Sovereign bestowed upon him, especially for his researches in Mediaeval art and archeology, the Companionship of the Order of the Bath.

We have, on many occasions, freely expressed our regard for Mr. Parker's many estimable qualities, both personal and professional, and we have never shrunk from expressing our dissent from some of his inferences, while fully admitting the trustworthiness of the facts upon which he based them. He was gifted with keen insight, a wide and various knowledge of his subject, a large measure of enthusiasm, and great tenacity of purpose. He was ardent in the accumulation of data; but, in our judgment, the logical faculty was not equally strong in him, and it remains for others profiting by his immense labours to follow and revise, in some points, the lessons he drew from the stores of facts which he accumulated.

Mr. Parker was born in 1806, and educated at the Manor House School, Chiswick. He entered upon the business with which his name is identified in 1821. He married Miss Frances Hoskyns, a daughter of the Rev. J. W. Hoskyns, D.D., and he leaves behind him in works of permanent value, of which we append a catalogue, the evidences of a long, well-spent, industrious, and honourable career.

List of Works by John Henry Parker, C.B.

- A B C of Gothic Architecture. First edition published June, 1881.
- Introduction to the Study of Gothic Architecture. First edition published 1840.
- Glossary of Architecture. First edition published June, 1836.
- Rickman's Architecture. Fifth edition. Edited by J. H. Parker. Published 1848.
- Domestic Architecture, 3 vols., published 1857-60.
- Viollet le Duc, Military Architecture, translated from the French. Preface by J. H. Parker. Published December, 1867.
- The Mediaeval Architecture of Chester, 8vo. Published June, 1858.
- The Architectural Antiquities of the City of Wells, 8vo. Published September, 1856.
- Mosaic Pictures at Rome and Ravenna, 8vo., 2s. 6d., Reprinted from the *Gentleman's Magazine*. 8vo. Published July, 1849. Afterwards incorporated in the volume "Church and Altar Decorations," Part XI. of "Archæology of Rome."
- Archæology of Rome -
 - Vol. I., containing Parts 1, 2, and 3. Published December, 1873.
 - Supplement to Vol. I., Part 4, "Egyptian Obelisks." Published December, 1875.
 - Vol. II., containing Parts 5 and 6. "The Forum Romanum," and the "Via Sacra." Published August, 1876. Afterwards published separately.
 - Part 7, "The Colosseum." Published October, 1876.
 - Part 8, "The Aqueducts." Published December, 1876.
 - Parts 9 & 10, "The Tombs." Published August, 1877.
 - Part 11, "Church and Altar Decorations." Published December, 1874.
 - Part 12, "The Catacombs." Published August, 1877.
 - Part 13, "Early and Mediaeval Castles." In the Press.
 - Part 14, "The Mediaeval Churches." In the Press.
- Plan of Ancient Rome. Published March, 1879.
- Architectural History of the City of Rome. Abridged from the "Archæology of Rome." Published November, 1881.
- A Catalogue of 3,300 Historical Photographs of Antiquities in Rome and Italy, taken under the direction of J. H. Parker. Published 1879.

PORTLAND CEMENT.

OWING to the extending use of this material in modern architectural and engineering constructions any information respecting its chemical constitution and characteristics, the processes involved in its preparation, and the means of ascertaining its value as regards its strength, and its resistance to the effects of the atmosphere, fire, or water, is of the highest importance.

Prior to the exhaustive and systematic tests conducted by Mr. Grant during the construction of the Metropolitan drainage works, contractors knew very little respecting the real qualities of Portland cement, as to its powers of resistance and durability, and it is not surprising that some of the original applications of the material were not successful; indeed, so numerous were the failures that the material was discredited by many. Fortunately, Mr. Grant's experiments left no doubt as to the unquestionable value of the material when properly made and used. The small volume before us, by Mr. Fairf, C.E.,*

* Portland Cement for Users. By Henry Fairf, C.E. Second edition. (Weale's Series.) London: Crosby Lockwood & Co.

is intended as a guide to the user of Portland cement. The author in the chapter on the weight of cement, as a test of its quality, usually taken at 112 lb. per struck bushel, points out that inasmuch as by various means of filling the measure a difference of from 10 to 15 per cent. in the weight of the material can be obtained with the same cement, and as the weight also varies with the degree of fineness of grinding, the weight alone cannot be considered a reliable datum from which to judge of the quality of a cement. It is suggested that the specific gravity might be taken as a guide to the extent of calcination which a cement has received: by this method the two elements of error mentioned as incidental to the weight standard of value are avoided.

The finer and more uniform a cement is ground the better; in properly made concrete or mortar each particle of sand and aggregate should be in contact with cement, and this desideratum can only be obtained when the cement is finely ground, and here it may be added that the degree of fineness of the sand also and its absolute purity are of equal importance; indeed, unless the same care is observed in selecting the sand for actual use, the chemical and crystallising action of setting is never thoroughly effected. Mr. Grant specifies that Portland cement is 'to be gauged with three times its weight of dry sand which has passed through a sieve of 400, and been retained upon one of 900, meshes to the square inch.

Mr. Faija mentions a not generally known peculiarity attending the sifting of cement, viz., that when the cement is sifted, the part of the cement which does not pass through the meshes of the sieve has practically no setting power. Mr. Faija concludes from this that cement to be effective must be ground to an impalpable powder, and that granulation is ineffective.

The principal points to be considered in the process of gauging are, first, the careful manipulation of the materials, the proportion of water, and the form of briquette, or the form of cement-mould to be tested. The briquette should be of such a form that the strain under testing shall be entirely one of tension, and the briquette should be easily removable from the clips and mould. The proportion of water to the cement should be carefully arranged, from 17 per cent. to 18 per cent. of water is the usual quantity for cement, to be tested neat, or without sand. Slow-setting cements require less water than quick-setting ones. When the cement is mixed with sand, in the proportion of three to one, about nine per cent. of water only is required. Before being placed in the mould, the cement should quickly, and with a minimum quantity of water, be brought into a pasty tenacious mass that will remain in any position it is beaten; by a little practice with a trowel this is easily done.

The cement may now be placed in the mould; the exclusion of the air may be assisted by gently tapping the sides of the mould.

The following are the visible changes which occur during the chemical action of the setting of the briquette after being withdrawn from the mould:—

The water is exuded to the surface to be again absorbed, heat is now generated, resulting from the chemical action, and when this is completed the mould gradually cools to its normal temperature, and is then technically termed set. Of course, the more active the chemical action the higher the development of heat; hence the quick-setting cement develops more heat in a given time than the slow-setting one.

The freedom of cement from liability to contract and expand may be ascertained by carefully examining the mould. If defective in those respects, fine hair-line cracks, or an alteration in the form of the mould, will be apparent. Portland cement should always be kept stacked for a considerable time before it is applied for constructional uses; if used too soon after being made, air is evolved from the cement, causing part of it to shell or flake off.

Formerly, Portland cements were usually tested seven days after being properly gauged; but owing to the fact that many cements have not attained their ultimate strength in that time, twenty-eight days from the date of gauging has become the acknowledged period. The test briquettes are now made so as to have one square inch of sectional area subject to tensional strain, and not $1\frac{1}{4}$ square inch as formerly.

Mr. Faija is not very sure as to the advisa-

bility of testing cement with sand,—the plan adopted by Mr. Grant and the German Government,—for the reason that sand of uniform character is difficult to obtain; but this reason is hardly sufficient to outweigh the advantages attending the method of testing the cement with sand, as this test is most decidedly superior in enabling the user to ascertain the quality of cement when applied. Moreover, many cements, although having an inferior cohesive strength, show a superior adhesive strength. The difficulty as to the sand might be overcome by users specifying pure white granite sand which will pass through a sieve of a given number of meshes.

Little is said in the volume before us of the chemistry of Portland cement. Although the exact and complete chemical action involved in the setting of cement has not as yet been defined, it is generally acknowledged to be a combination of the silica with the lime.

The following is an analysis of English (Thames) Portland cement taken in 1881 (Dingl. Polyt. J. 246-539):—

Insoluble	S ₂ O ₃	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO
2.84	21.307	6.593	5.386	61.450	0.449
	So ₃	K ₂ O	Na ₂ O		
	1.422	0.437	0.429		

=100.376.

The principal constituents are the Silica S₂O₃ and the lime (calcium CaO), and the most active agent in the setting of Portland cement is the Calcic Silicate, S₂O₃. 2CaO. This, by contact with water, produces a substance crystallising in hexagonal plates and playing the chief part in the hardening of the cement. A singular deficiency in Mr. Faija's book is the absence of information as to the adulteration of cement and the means of ascertaining if adulteration is practised.

The material most commonly used for adulterating Portland cement is blast-furnace slag dust. The presence of this substance in cement can be ascertained in three ways.

The specific gravity of Portland cement is 10 per cent. less than that of slag dust. Under the microscope Portland cement forms porous lava-like grey granules; slag dust, vitreous sharp-edged white or greenish granules. Pure Portland cement extemporaneously mixed with 33.3 per cent. of its own weight of water forms a liquid paste, whilst slag dust requires 40 per cent. to 45 per cent. So common has become the practice of adulterating cement with slag dust, Roman pozzolana, glass, flint, trass, &c., that the Society of German Cement Manufacturers has resolved to consider the sale of cement adulterated with more than 2 per cent. of foreign bodies as a fraud on the buyer, unless the nature of the mixture be made clearly known on sale and delivery.

The specific gravity of Portland cement may be taken as from 3 to 3.1. It is of a cold grey colour. The darker it is the more calcination it has received, the lighter the colour the less the calcination. According to Mr. Faija,—"All over-clayed cements have a tendency to contract, never attain any very great strength, and are always quick-setting. An over-limed cement has a tendency to expand, has a tendency to blow, and is always slow-setting. The presence of too much lime is actually destructive.

Mr. Faija says that a good cement should possess the following properties:—

1. Fineness.—To be sufficiently fine to pass through a sieve having 825 holes to the square inch, and leave only 15 per cent. of residue when sifted through a sieve having 2,500 holes per square inch.
2. Weight, per struck bushel, to be not more than 116 lb. nor less than 112 lb.
3. Specific gravity to be between 3.00 and 3.05.
4. Set.—A pat made with a minimum quantity of water to set in not less than three hours, nor take more than six hours.
5. Tensile strength.—Briquettes which have been placed in water sixteen or seventeen hours after gauging to carry, at the expiration of seven days, 400 lb. per square inch without fracture, and at the expiration of twenty-eight days from gauging to have increased in strength at least 25 per cent.
6. Expansion or contraction.—Pats left in air or placed in water not to show cracks or other signs of deviation in form.
7. Colour.—The cement to be of a cold grey colour, not to show change whether in air or water.

The chapter on the application of cement, although not sufficiently comprehensive, is of some value. Mr. Faija considers, and with truth, that the great enemy of cement is loam clay or dirt, and lays proper emphasis on the importance of having perfectly clean aggregates. The water should be added to the concrete gradually, whilst the mass is being continuously turned over with a spade, in order that all the constituents may be thoroughly well wetted. It is a mistake to add the water too quickly. Mr. Faija rightly condemns the custom of tipping the concrete into position from a height, seeing that when a barrowful of concrete is so tipped, the larger pieces of the aggregate fall to the ground first, the smaller pieces next, and last of all the mortar or cement, so that the aggregate and matrix become separated, and the value of the concrete is all but destroyed.

The use of concrete applied to walls, beams, or floors is not considered; but Mr. Faija has expressed his views in the instructive correspondence on this subject in these columns, by which this application has been well discussed, and a formula advanced by Mr. B. H. Thwaites. The chapter on the various forms of briquette testing-machines is useful, but not so comprehensive as one could have desired.

In the appendices are a valuable series of tables of tests on the strength of various cements, and also a series of analyses of various cements, clays, and limestones, and tables giving the specific gravities and adhesive powers of cement and building stones. To those who are not in possession of the papers and discussions on this subject contained in the Minutes of the Proceedings of the Institution of Civil Engineers, or of Mr. Reid's valuable treatise, we can recommend this little work. By the following process Portland cements are said to be rendered less subject to atmospheric influences:—The cement materials should be allowed to remain in a cold solution of 1 part ferrous sulphate, in 3 parts of water, for twenty-four hours, after which they are dried in the air. The compound of iron hydroxide formed renders the cement firmer and harder, and less subject to atmospheric influence.

MR. RUSKIN IN THE CLOUDS.

THE audience who squeezed and struggled into the lecture-hall of the London Institution last Monday afternoon to hear Mr. Ruskin discourse on "The Storm Cloud of the Nineteenth Century," must have been considerably surprised when they were told at the outset of the lecture that there was no *arrière pensée*, no double meaning concealed behind the title of the lecture, that he had not announced one thing with the intention of lecturing on another, though, as he candidly admitted, it would have been "very like him" to do so. The storm-cloud of the nineteenth century was a physical storm-cloud, which came into existence during the last decade, or a little earlier, patently to Mr. Ruskin's observation, though unnoticed by those of only ordinary perceptions. So thoroughly is Mr. Ruskin a *laudator temporis acti*, that, like the man who declared there had been no good weather since the Whigs were in power, he has discovered that in these latter days even sunsets and cloud effects have lost their beauty, and that a special form of storm-cloud has arisen, in harmony with the mean and unrighteous spirit of these latter days. That there were once fine sunsets and grand effects to be seen, even from storms, was made apparent by quotations from Homer and Byron, which left the matter in no doubt whatever, in addition to the evidence of Mr. Ruskin's own observations in earlier life. But in walking from Oxford to Abingdon in 1879, he was disgusted by the formation of clouds in a manner which he had not observed before, and of which no record existed in literature. These were only small clouds, but they formed unexpectedly in a serene heaven, without Mr. Ruskin's leave, and in a manner which displeased and dissatisfied him very much, and were accompanied by a peculiar blighting wind. Since then the phenomena had been constantly repeated in a much more intensely disagreeable form, and in a manner quite different from that in which a good old-fashioned storm or cloud used to do its work. In healthy weather the sun was hidden behind a cloud as behind a tree, but when the cloud had passed the sun came out again as bright as before. But in "the plague-wind" the sun was choked out of the whole heaven all day by a cloud, which might

be 1,000 miles square and five miles deep. And yet that thin, scraggy, filthy, mangy, miserable cloud, for all the depth of it, could not turn the sun red, as a good business-like fog did with 100 ft. or so of thickness. In a coloured drawing which was exhibited of the effect of sunset in entirely pure weather, the smoke in the horizon, though hiding the sun, yet hid it through gold and vermilion. But if they wanted to see what the sun looked like through the plague-cloud they had only to throw a bad half-crown into a basin of soapy water. What was the reason of this? He could tell them a sufficient reason. For the last twenty years England and all foreign nations, either tempting her or following her, had blasphemed the name of God deliberately and openly, and done iniquity by proclamation, every man doing as much injustice to his brother as it was in his power to do; and all prophets had said in all time, in various language, that under such a state of things the light should be darkened in the heavens, and the stars should withdraw their shining. Let us regain the paths of rectitude and piety, and, perhaps, the promise of old would be fulfilled and the windows of heaven be opened again.

Such is an outline of the substance of the discourse which several hundred people listened to with outward seriousness for an hour and a quarter. Not that the lecture was by any means without real interest in parts. The drawings of sunset skies and cloud effects, enlarged by Mr. Severn and Mr. Collingwood from Mr. Ruskin's original sketches, were very fine, and well worth seeing, and the picturesque language in which they were described and commented upon was worth hearing; and in the description of the march of a stupendous mass of cloud, as he one day saw it, sweeping over Westminster, "precipice keeping pace with precipice," and the Victoria Tower looking "like a mere lamp-post" in front of it, Mr. Ruskin was at his best of poetic and fervid word-painting. Very amusing, too, in a sense, were his schoolboy jokes and skits at the men of science, and very edifying they must have been to two or three of the leading men of science of the day, who were prominent amongst the audience. In one happy moment the lecturer came very near scoring off the "men of science," when he convicted them of using "vibratory" and "undulatory," as synonymous terms in reference to the theory of light; but he spoiled it by going into detail, and describing wave-action in water as a process by which the water was taken from the trough of the wave and placed on the crest, which is by no means a true definition, unless in the case of a breaking wave, where the upper portion of the mass of water is impelled over the lower through the cheek given by the shore or rock against which it breaks. In ordinary wave-action, the same particles of water rise and fall perpendicularly, and are alternately trough and crest. He went beyond his tether again in asking scornfully what vibratory motion there was in a billiard-ball, for example? Perhaps Sir William Thomson could give him a little information on that point. Mr. Ruskin's positive assurance that insight dwells only in his own mind, and that all who differ from him are "blockheads," gives, no doubt, a certain point and vivacity to his discourse, though that is not the kind of thing that people ought especially to look for in a lecture given at an important educational institution. But when we turn from the occasional bursts of eloquence which were impressive, and the numerous wrong-headed sarcasms which were amusing from their very absurdity, to consider what was the real scope of the whole bundle of talk, one can only express astonishment, not unmixed with contempt, at the sort of follow-my-leader fashion in which a number of people will scramble after each other like so many sheep, to hear a man who has got a name deliver out to them sentiments and opinions which, when divested of the cloud of prismatic word-painting in which they are wrapped, appear to be little better than "old wives' fables."

Herr Julius Pintsch.—The German technical press has given prominence to the death of Herr Julius Pintsch, whose efforts to accomplish the illumination of railway carriages by means of compressed gas met with deserved success at last year's Berlin Hygienic Exhibition. There was then exhibited a marine buoy, where a receptacle for 300 cubic feet of gas would keep a light burning constantly during four months.

ON "COLOUR DECORATION." *

IN laying down rules for practical decoration, the subject must be divided under various heads. There are certainly rules which are generally applicable, but there are also those which must be applied under conditions of limitation. Among the latter must be classed those which concern the purpose of the room or building, the style of architecture employed, and the manner of lighting both by day and night.

Let us take first the rules of general application. Under this head may be ranked those which affect the expression of proportion and of form, and those which concern harmony of colouring.

That the proportions of any interior may be very largely affected by the scheme of decoration is, of course, very well known to you, as are also, no doubt, a few of the broader rules bearing on this axiom. It may also not have escaped your observation that they are constantly disregarded, even by architects, when they dabble in colours, who seem too often to be carried away by a love of some particular arrangement of wall surface; sometimes a wide frieze, at others a high dado being indispensable to their content, whatever the height, or size, or style of the room. Now, I shall ask you to make it your fixed rule to begin by considering the size, proportion, and other conditions of your room, and then to determine whether it is desirable to express or add to its apparent height, or its apparent width and size. You can, if necessary, considerably increase either, but not both. It will generally be found that, speaking broadly, what you add to one you take from the other. When this point has been decided, you will find it a much easier matter to deal consistently with the arrangement or division of the surfaces presented to you. Observe, I by no means insist that a room must be made to look higher, but I do insist that you should know whether you intend it to look higher or not, and that your distribution of surface decoration should not be entirely regardless of proportion.

It is a very common fallacy that to colour a ceiling is to lower it. Still more often is this result expected if projecting ribs or mouldings be added to divide the blank surface. Yet it may easily be shown in argument, as it is constantly exemplified in practice, that the opposite effect is quite as often produced, colour being the determining agent. Let us assume the walls of a small private library, 12 ft. high, to be hung with one of the embossed leather papers now in frequent use: the pattern brown and gold on perhaps a warm green ground; the bookcases below, of oak or walnut wood, with their contents, maintaining a quiet similarity of general tone. The cornice is say 9 in. deep. If you leave it a light tint and the ceiling plain, the room will appear quite 9 in. lower than it would were the cornice brown, like the bookcases. And if this brown is continued on to the ceiling by means of wooden ribs, the room will gain at least another 6 in. in apparent height.

The fact is, that the point at which the attention is arrested by a marked contrast is that by which the eye assesses the height; and since the mouldings of the cornice project inwards to the room, even more apparent height is gained (than is marked in vertical distance) when the contrast is placed high, since advantage is taken of an apparent perspective.

On the other hand, if it be desired for other reasons to retain the wooden ribs and cornice, yet not to add to the apparent height, a corrective is readily applied in colour,—either in the form of a narrow frieze, of sufficiently emphatic contrast, below the cornice, or by contrasted relief of colour at the same point as the cornice itself. Even a line of gilding may suffice.

In the same way the influence of a wide frieze or a dado on the proportions of a room is largely controlled by the colouring. A wide frieze may be used of the same colouring or even of the same depth of tone as the wall below, without materially affecting the apparent height; but a

very small amount of contrast in tone will be sure to tell in the case of a large plane surface. Hence, if a frieze with some contrast be used where height cannot be sacrificed, it is essential to place its brightest contrasts as high up and as near the cornice as possible, lest the eye be arrested at the bottom, and the frieze itself, together with the cornice, be relegated to the ceiling. Some rooms are high enough to bear this sacrifice of wall, in which case they largely gain in apparent width and space.

So much for the horizontal lines, which are the most important; but the vertical lines and the manner of dealing with them must not be forgotten. Perhaps, during the last few years, they have been rather unreasonably ignored. Of course "pilasters" are not always essential or desirable,—in many rooms they are absolutely out of place,—but your modern "art decorator" seems to have forgotten that such a feature is available anywhere; and your modern "lady of taste" hears you utter the word "pilaster" with the same suppressed emotion which she would exhibit if she heard a sailor swear,—she only excuses it "as language belonging to the profession." My advice to you is by no means to discard so useful a means of expressing height or symmetrical arrangement. It is especially useful where you want the dignity of architectural expression in a limited space. In the case of a long unbroken wall, pilasters are a useful means of preventing that apparent sagging of the cornice line which is apt to trouble the eye, and which the Greeks were so well aware of as to substitute a gentle curve for the weak horizontal line.

I must be understood, when speaking of "pilasters," to use the word in the decorative sense, not in the architectural. I do not necessarily mean a feature having capital and base. A narrow vertical panel, distinguished from the larger wall-spaces which it divides, is equally a "pilaster" to the decorator. If ornamented, its ornament must have a vertical direction.

There are in most rooms certain features which may be made to aid in the expression of proportion. Such are doors, windows, and chimney-breasts. In nine houses out of ten the dimensions of the door have no relation to those of the room. There are many ready methods of getting over this difficulty, such as the addition of door-head or frieze, with capping moulding; or, in some cases, continuing the framing of the door so as to enclose a panel above it, to be treated distinctly from the other wall-surface. Then, again, the windows may, by the arrangement and colouring of the draperies, be made to distinctly influence the proportion. And so with the chimney-breast, a marked feature in most ordinary dwelling-rooms. A sense of size and importance may often be given by treating the whole breast as a part of the fireplace arrangement, or, at any rate, as a distinct feature. Examples of the effect of such treatment will occur to you in several of the old public buildings of France or Flanders. You remember the magnificent one at Bruges; and this arrangement in various forms occurs constantly in the French palaces and châteaux from the Medieval periods down to the expiration of the monarchy. In the elegant decorations of the "Louis XVI." period, the full height of the wall above the chimney-piece is constantly associated with it in one group; and our own Elizabethan examples are so numerous as hardly to need mention.

I have dwelt thus on the question of proportion as influenced by the colouring and decorative features, because I see it so constantly disregarded, and it appears to me that it should be the decorator's first problem.

After all, it is the ceiling which is in most cases the decorator's great opportunity. Where it is already divided into panels or ornamented in relief his first consideration will be how to do it most justice,—to express it in the best way, and to emphasise the right points. Apart from the actual harmony of colouring, the good management of light and dark tones is of the first importance; to give point without producing patches of colour, and obtain a sufficient uniformity of effect without tameness or monotony. It is astonishing how a ceiling may be lifted out of mere flatness by the judicious disposition of its leading lines. If these are rightly expressed much may be forgiven in minor defects of ornament or colour. The ceilings of the great majority of our rooms are flat, owing to the exigencies of space, no less than to those of cost. Let us therefore con-

* A paper by Mr. John D. Crace, read before the Architectural Association on the 1st inst. In the course of his prefatory remarks Mr. Crace referred to two former papers read by him before the Association on the subject of colour decoration, and in which he treated the matter of its study from two points of view,—one as affected by the study of art examples, the other as affected by the study of nature. See *Builder*, vol. xxxi., p. 245 (March 21, 1874); and vol. xxv., p. 613 (June 16, 1877).

sider what variety of effect is attainable with ceilings of flat construction.

In the first place, where a perfectly flat plane of plaster is presented, there are the alternatives of treating it with colours alone, or of previously subdividing it by mouldings or relief ornament. The latter treatment is the one which obviously recommends itself where there is not too close a limit of cost, and especially if the area of ceiling be large. It is indeed most difficult to treat satisfactorily, with colour alone, a large area of plain flat ceiling, and such treatment should really be limited to ceilings of small dimensions. I will return to this point. The methods of division are numerous enough, and the decorator will be guided by several considerations in deciding on which to adopt. The amount of relief must be determined, firstly, by the height and size of the room, especially by the height, but also by the depth and richness of the colouring intended for the walls. Here, again, comes in the question of the ultimate use of the room; for a light and gay colouring is not compatible with the use of heavy mouldings or deeply-recessed panels in the ceiling. This is one reason why the relief ornament of the ceiling should either be designed by the decorator or in co-operation with him. To be successful it must form a part of the colour scheme. The light and shade of the relief ornament and mouldings are a most important factor in any scheme of colouring.

Like the walls, a ceiling may be so divided and subdivided as to materially affect its apparent length and breadth, and upon the same general principles. This, whether with or without any relief of mouldings, but preferably by their aid. It has already been explained that height is to be given by attracting attention to some feature high up in the cornice, but you may go further and place your decisive contrast in the margin of the ceiling itself. From this point you may, if the area of the ceiling be square or nearly so, either maintain a flat or horizontal effect, or you may impart to it an appearance of rising from wall to centre.

Where the intention is to maintain the effect of a horizontal ceiling the principal lines (if firmly expressed) must be distributed with even impartiality over the surface in a design consisting of a repetition of geometric forms, or of forms having the appearance of repetition, or monotonous in their degree of relief. Or, again, very marked straight lines, taken from cornice to cornice across the ceiling, will emphasise the horizontal sufficiently.

When, on the contrary, it is wished to raise your ceiling in the centre, it will be necessary to take care that your main lines are clearly marked by vigour of relief or express a growth from sides to centre. Your colouring must be so adjusted as to keep, firstly, the sharpest contrasts to aid in expressing their growth; secondly, the weight of colour gravitating towards the angles. In like manner the ornamentation, whether in colour or relief, should be made to assist in the effect of growth towards the centre; in fact, to flow with the same motive or tendency as it should have were the ceiling actually concave.

It may be useful here to lay down an axiom in reference to moulded ceilings. It is this:—"For light tints of colour, and with bright, gay tones, the relief of moulded surface should be very moderate. Strong relief of moulded surface is compatible with the use of powerful colour in masses, and with dark low tones. It may, moreover, be taken as a general rule for any situation that "strong shadows are incompatible with the use of light tints."

What I have already said as to moulded ceilings applies almost entirely to the distribution and character of the dividing main lines. The ornamentation of the intervening spaces may be left almost untrammelled by rules, if it but retain a subordinate position, except only where special accentuation of the general design is required.

Now, providing that the surfaces be not too large, precisely the same general rules will apply to the decoration in colour only of plane flat ceilings, without the aid of relief. Lines of expression must be used of colour so firm as to lead the eye with decision, and to take the place of the mouldings whose direction we have been considering. The emphasis yielded by light and shade being lost, the whole treatment must be lighter and simpler. A subdivision into monotonous repetitions of form is rarely pleasing in colour only. A greater freedom is,

for the most part, desirable. Once the spectator is aware that it is by the brush alone that the surface has been treated he expects, to some extent, the freedom of hand that the brush suggests. You find this admirably exemplified in the Greek work of Pompeii, and no less in many of the best works of the Renaissance. This freedom applies perhaps more to the treatment of ceilings than of walls; but in a less degree it applies to walls also, if other conditions do not impose some severity of treatment.*

ARTISANS' AND LABOURERS' DWELLINGS.†

THE BUILDINGS OF THE PEABODY TRUST.

THE present condition and future improvement of the dwellings of the poor is a subject which may be compared not inaptly to a patient generally out of health, and requiring special treatment for its restoration. It has lately occupied more than usual attention, in consequence of the notice which has been attracted to it by the able and comprehensive articles of Lord Salisbury and Sir Richard Cross.

Much has been both said and written regarding it since these articles appeared, and many important suggestions have been made at the public meetings which have been summoned to discuss it, but these suggestions are, as they were necessarily intended to be, only general, and the working out of the details required to turn them to profitable account has been left to the consideration of others.

Before proceeding to inquire of what these details consist, and how they can be best applied, it may, perhaps, be well to endeavour to obtain as clear a conception as we can of what is meant by "the dwellings of the poor." To render this less difficult, some definition is required, in the first place, of the meaning of the word "poor."

It may be taken for granted that there are few who will venture to regard the poor as a homogeneous whole,—a sort of conglomerate of human beings to be treated as if they were altogether, or even in a great degree, without individuality. If, therefore, the whole is to be benefited, it must be admitted that the parts which comprise it have to be considered, and must be dealt with separately. These parts, sections, or classes are so numerous, that it would be very difficult even to specify them, and to describe them fully and accurately is, indeed, almost impossible, owing to the variety of opinions which is held regarding them. Those who compose them differ widely in their habits, modes of living, and wage-earning powers, and these differences are increased by the circumstances of locality and occupation. A merely superficial acquaintance with them often leads to conclusions which are far from accurate. Opinions are formed from outward appearance and other misleading characteristics, which become modified after more experience, but which often create a good deal of mischief in the meantime. A short time ago costermongers and sweeps became objects of especial sympathy, and strong opinions were expressed in consequence of no provision being made for their especial convenience and accommodation. Too often these members of a respectable fraternity would be classed among the very poor, because they are so often very far from clean; but they would be indignant indeed if they knew the opinions expressed upon the position they are supposed to occupy in society. Were this position dependent solely on their annual income, they would rank far above many a young curate, barrister, or aspiring artist. Their "weekly" wages certainly vary, but during the summer months a costermonger's earnings are very considerable, and a provident sweep may become in these days a landed proprietor. They are among the aristocracy of the poor, and generally held themselves superior to the attractions offered by the buildings we are about to describe. Among the most really poor are the scavengers; but the philanthropic public do not care very much about them, partly, perhaps, because their appearance is somewhat piebald, clean and dirty alternately, according to the weather. They are, however, deserving of more sympathy than they receive, because they are generally men whose bodily

infirmities unfit them for other labour, and their earnings are precarious: the weather which contributes to the peculiarity of their appearance, unfortunately affects their pockets much more seriously.

Recognising, therefore, the great variety of opinion which exists as to the proper classification of the poor, and believing that so long as these various opinions influence those to whom the subject of their dwellings is one of especial interest, so long will there be a difficulty in dealing with it in a satisfactory and practical manner, let us inquire whether there be one opinion among this great diversity in which all can agree, and of whose truth there can be no question. Who will not willingly concede that of all the classes which constitute the poor, two sections, and two only, stand prominently forward, and declare themselves to be the most important, namely, the poor who work and the poor who do not? It is with reference to the former class,—the poor who work,—that the following remarks are offered.

The working or industrious poor may be defined as those who endeavour to obtain a living by honest exertion, who receive payment for their labour with more or less certainty all the year round, and whose wages are sufficient to keep them free from parish relief. This class is very large, and in dealing with it it is necessary to divide it into sections. This necessity has been proved by experience. Subdivision lightens the labour with which all are acquainted who undertake any important philanthropic work, and, without its aid, it too frequently happens that the best intentions will only result in failure and disappointment. If one subdivision or class be selected as the recipient of the benefits to be conferred by one individual, or one associated body of individuals, the probabilities are that much substantial and lasting good will be accomplished, provided that as full information as possible be obtained in every particular relating to their antecedents, habits, and occupations, before endeavouring to supply their wants.

The class provided for to try the dwellings we are about to describe is that which consists of artisans and labourers, whose weekly earnings do not exceed 23s. or 24s. per week. This wage-earning limit relieves the work to be undertaken of much of its difficulty, but it does not entirely remove it; for as Sir Richard Cross has truly observed in his admirable article in the *Nineteenth Century*, people have to be dealt with as well as houses; the people to be dealt with in one part of London may be (and experience shows that they are) "totally different in character from those who have to be dealt with in another part, and as with people, so with houses, it is impossible to apply one general rule in all cases." Frequent intercourse with the working men, to whichever class he may belong, amply confirms this statement. It is remarkable how the habits, ideas, and what may be termed the social position and prejudices of men earning the same wages, may differ in different localities, especially if engaged in different occupations. And in this consists the difficulty as to how the wants created by this great variety of requirement are to be met in the most judicious and satisfactory manner. It is an old proverb, but a very true one, that "habit is second nature." And as habits are not altered by mere change of dwelling, if the improvement offered by the dwelling is to be acceptable, the accommodation must, to a certain extent, harmonise with the requirements and habits of its occupant. Moreover, the improvement must be gradual; otherwise those who would make too great and sudden a change, and attempt too much, will end after experiencing loss and disappointment in accomplishing nothing. It will hardly do to accept as an axiom that every working man must have a self-contained tenement with a living-room, scullery, wash-house, closet, and at least three bed-rooms for himself, his elder children, and his babies. Those are luxuries which, were they at his disposal, would in many cases add nothing whatever to the real comforts of his life, unless he were first educated, through custom, to use them without abuse. To place him in such a dwelling, after occupying a tenement of one or at most two rooms in a slum at the far East of London, where he and his wife and family have been in the habit of herding together without any of the appliances of domestic decency or comfort, would be simply to make him miserable; and instances can be

* The remainder in our next.

† A paper read by Mr. H. A. Darbishire, F.R.I.B.A., Architect to the Peabody Trustees, at the Farkes Museum, on the 31st ult.

quoted of entire families of young and old preferring to remain crowded together in one room not more than 10 ft. square, and divided by only a miserable curtain, rather than exchange it for the better accommodation of a so-called model dwelling. Such people cannot be expected to know how to accustom themselves all at once to the conveniences of decent living, the use of which they hardly know. It is a mistake, too, to assume that he will be grateful, at all events at first, for any extension of his domestic limits, especially if this be attended by the very smallest additional claim upon him in the shape of rent. A single room, which serves him as "parlour, and kitchen, and hall," has its charms, which a larger tenement may deny him, and one of these, and to him a very important one, is *warmth*. Cold and fresh air are too often regarded as abominations and plagues to be avoided—an antipathy supposed to be attributable to the fact that, while he is at work during the day his body becomes warm, and is kept warm by his exertion, and when his labour is over the blood loses its high temperature, and he becomes very sensitive to cold. Again, with regard to his rent, it is so serious a draught upon his earnings that, if he can see any means of reducing it, he will certainly avail himself of them, and it is with difficulty that he can be tempted to increase it by the offer of additional space or of the luxury most esteemed by his wife, ample washing accommodation.

Having regard, therefore, to his wants, habits, and inclinations, it is necessary to render his dwelling acceptable to him under difficulties which are not always very easily overcome. The number of the rooms must not be more than he can use for living purposes. Their size must not be too great, nor their shape too irregular to prevent his scanty furniture from being placed and easily adapted. The general structure must be solid and plain, and the fittings simple and substantial, free from complication as much as possible, and capable of easy repair, especially the cooking arrangements, the water-supply; and, lastly, the rent must be low, and well within his means.

Before entering into a description of some dwellings which have been provided by the Peabody Trustees to meet these requirements, at least to some extent, a few words must be said regarding the sites upon which it is most desirable to build. If it be required to be freehold, or if it be sought in a particular locality for the convenience of one particular class of poor, it may be both very difficult to obtain and very high in its price. The character of its tenure may possibly affect the construction of the buildings which are to be erected upon it. Those who would be disposed to build very substantially upon a freehold site might hesitate to do so upon one that was held under an unfavourable lease. It may be subject to a high or a low ground-rent; it may be in a crowded thoroughfare or in a suburb which can only be reached by railway, and therefore useless for the purpose of dwellings for those who are obliged to be near the manufacturing and shops which afford them employment. It may be surrounded by lofty buildings, which not only impede the free circulation of air, but exclude the daylight at an early hour, and render it unfit for the use of those who are engaged on any kind of work at home; it may be covered by old buildings, which, with any subterranean works connected with them, must be cleared away before it can be available for the new; it may possess a valuable subsoil, or it may prove to have been the receptacle of all the refuse of the neighbourhood for years, which must be removed, lest on its being disturbed its miasma produce sickness and disease. Two important requisites, however, it must possess,—namely, sufficient size, and a convenient shape.

It has been calculated that the population of London and its suburbs is little short of four millions and a half, and that of this number three million live in cottages only two stories high. As this huge population is daily receiving a large increase to its numbers, and as each foot of building space is daily rising in value, it is evident that two-story cottages must be abandoned in favour of buildings which occupy a smaller area and provide much greater accommodation. After the most economical plan of one of such buildings or blocks has been determined, the site which accommodates the greatest number at the least sacrifice of space, air, and light, is the best and most desirable. The superficial contents of two sites may be

the same, but the shape of one may render it only half as available for building upon as the other; therefore area alone cannot be accepted as a correct standard by which its value can be estimated.

The dwellings referred to as having been provided for the artisan and labourer class are built in blocks, each occupying 2,197 superficial feet. They are 75 ft. 9 in. long; their greatest width is 33 ft.; and their least width 26 ft. 9 in. Their height is 48 ft. from the ground-line to the eaves of the principal roof. These dimensions allow each block to contain fifty rooms, viz., ten on each floor, exclusive of cupboard spaces, sinks, and water-closets. They are convenient, and are useful in supplying a datum by which the accommodation of a site intended for the erection of this class of associated dwellings can be tested; for this reason they have been adopted and generally adhered to as far as practicable. The blocks are generally detached, and wherever the conditions of the site admit of this arrangement, it is very desirable to adopt it. Detached blocks should be at least 15 ft. from each other, and from their surrounding boundaries, unless these be public thoroughfares. Where it is necessary to economise space, two or more blocks may be joined together longitudinally, but each extension in length should be equal to that of an entire block, viz.,—75 ft. 9 in. if possible. When this cannot be done, the extension should not exceed 18 ft., which allows two additional bedroom, 9 ft. wide, to be added at each end. If the extension be greater than this, the bedroom accommodation will be undesirably increased, because there will be an unnecessary addition to the size of the tenement, and a certain loss of remunerative rent. From this it will be seen that the economical disposition of the blocks is very dependent on the facilities offered by the site. If it be too small, either full-sized blocks cannot be placed, or larger and less remunerative ones must be provided; and if its shape be irregular either space must be lost or the architectural disposition of the blocks will suffer.

Each block contains a basement, with two dust-cellars, and a store for the general use of the tenants; five stories of dwellings; and an attic, in which the washing and drying accommodation is provided. The basement, which occupies only a small portion of the block, and is situated immediately under the staircase, has a separate entrance at the back, so as to allow of the direct removal of the dust from the cellars. These receive the dust from two shafts 14 in. by 9 in., ventilated above the roof, and furnished at each floor level with iron trays, or hoppers, into which the dust can be swept by the tenants. The shafts are situated on each side of the staircase, so as to be equally accessible to all the tenants, and the hoppers are arranged so as to prevent, as far as possible, any large obstruction from being introduced into the shafts, but the most carefully-considered precautions are sometimes skillfully evaded, and broken pieces of furniture, old clothes, pots, pans, kettles, brushes, and other household refuse find an entrance, and often cause serious trouble before they can be successfully removed. In order to meet this difficulty, square holes, fitted with iron frames and doors, very similar to ordinary soot-doors, are provided at intervals throughout the length of the shafts, so that when a stoppage occurs its position can be ascertained and removed. The cellars are emptied once a week, and the separate entrance already mentioned facilitates the removal of the dust, without causing annoyance to the tenants. The remaining portion of the basement, not occupied by the dust-cellars, serves as a store for perambulators, and other cumbersome articles of furniture, which the tenants cannot accommodate in their rooms, and are unwilling to part with.

The ground-floor is raised 1 ft., or two steps above the datum, or ground line. The principal entrance is in the centre, and affords direct access to the staircase, which is opposite to it; this is 7 ft. 9 in. wide, and extends from basement to attic. On each side of it are recesses, leading from a central landing-space to the water-closets and sinks.

The arrangement of the dwellings is not uniform, and they vary in accommodation. Some consist of three rooms, some of two rooms, and some of only one; where the datum dimensions of the blocks cannot be adhered to with advantage four-roomed dwellings are provided, but these are the exception. This variety of accommodation has several advantages.

A working man, if unmarried, may first become a tenant of one of the single-roomed tenements which will supply him with all the conveniences a single man may require; should he marry he finds that he must leave this for a dwelling of two rooms, which will answer his purpose so long as his children are small, but, as they grow up and can add to the family store by their weekly earnings, however small, his two-roomed dwelling must in its turn be given up for one of three or four rooms. This ability to increase his house-room without having to leave the building in which he first established himself is found to act as a strong inducement to him to remain in one locality and to identify himself with it and his fellow-tenants. This all tends to increase his self-respect, and creates a feeling of attachment to his home which is not only beneficial to himself, but has a good influence on those with whom he is associated either during his hours of labour or relaxation. It not unfrequently happens, also, that his original tenement of a single room is taken by an old or dependent member of his family who wishes to be near him, and who is unable or unwilling to provide other accommodation. There are several instances of groups or colonies of families in the same block which could not occur were the dwellings uniform in size or arrangement.

All the rooms are 9 ft. 6 in. high from floor to floor; the living-rooms are 13 ft. long by 11 ft. wide; the bed-rooms are generally 13 ft. long by 9 ft. wide. Though these dimensions may not be the same in all cases, any departure from them which it may be found expedient to make is not appreciable, for they give a regular shape to the rooms and allow a fair share of wall space for the convenient disposal of the larger items of furniture. Carpets can be easily adapted to them without the necessity of cutting or fitting, which is a consideration much appreciated, especially when the occupation of the tenant necessitates a frequent change of residence. Moderate-sized rooms are more manageable than large ones, and two small rooms are more easily kept tidy than one large one. In a large room the space is generally wasted, the furniture carelessly disposed, and the heavier and more bulky portions are huddled together so as to make their removal a matter of difficulty on cleaning days. In small rooms space must of necessity be economised, cumbersome pieces of furniture are consigned to the store in the basement, and the wall spaces are sufficient for the disposal of those which cannot be dispensed with. Unless the furniture of a room be easily movable the probability is that dirt will be suffered to accumulate; and this probability will be strengthened if the room be insufficiently lighted. One large room is less likely to be well lighted than two small ones, and, as even a little sun will discover dust in a small room where a good deal would be wanted to find it out in a large one, so there is a better chance of general cleanliness and order being established in the one case than in the other. Again, in two rooms there are sure to be two windows; in one room the chances are that there will be only one; and, although fresh air may be jealously excluded during the later hours of the day, when work is over, a favourable moment may possibly occur when one of the two windows will be accidentally left open and establish a current between itself and the fire, and the entrance door, which will be beneficial to the health of the occupants.

Each living-room has a fireplace 3 ft. wide, furnished with a cooking-range, containing boiler, hot-plate, and trivet. The fireplace,—that is, the portion of the range which contains the fire,—measures 8½ in. by 8½ in. at the top, 8½ in. by 4½ in. at the bottom, and is 9 in. deep from the bottom to the top fixed bar, and 13½ in. from the bottom to the top fall-down bar, which serves as a trivet. Before these dimensions were adopted, the space occupied by the fire, which had been purposely made large to encourage the ascent of the smoke, was considered extravagant as requiring too much fuel, and smaller dimensions created difficulties as to the disposal of the necessary pot and kettle, which, for some unaccountable reason, are almost invariably so large as to cover the entire fire-space and prevent the smoke from finding its way up the chimney. Even the adoption of these dimensions, which resulted from repeated and patient experiment, has not met with the entire success which was anticipated. The large pot and kettle, the scanty and defective fuel, and not unfrequently inattention to the

diameter of the flue, all contribute to a state of discomfort which might be mitigated or altogether banished by the exercise of a little more care and a little less indifference on the part of the tenant. In order to obviate it as far as possible, the living-rooms on the topmost story of dwellings are provided with close ranges instead of open fires, and their flues are furnished with purposely-made chimney-pots. Smoke is almost always a trouble in the dwellings of the poor for the above reasons, but unless it be very bad indeed, it is one to which less objection is made than to others which might be regarded as much less serious.*

LYCIAN ROCK TOMBS.

PROFESSOR NEWTON continued to discourse on this subject in his fifth lecture on "Monuments of Lycian Art,"† delivered at University College on the 1st inst. Speaking on the so-called *block-haus* tombs, he referred to a portfolio of drawings made by Sir Charles Fellows, among which was a section of a tomb at Myra, showing the chamber within the structure in which the body was deposited, there being another chamber in the lower part of the tomb, entered by a square aperture. This aperture was obviously too small for the insertion of the body. What, then, was its purpose? In his opinion it was intended for the reception of the offerings brought to the dead. On this supposition the heavy top of the tomb would have to be placed *in situ* after the body of the dead had been placed in the chamber, and it would of course have to be lifted and replaced whenever another body was deposited in the tomb. The tomb known as the Chimæra Tomb, in the British Museum, was so called because the principal subject upon the carved portion of the roof was Bellerophon slaying the Chimæra. On other parts of this tomb were a battle scene, and a peaceful scene, representing the crowning of a youthful athlete. The Lycians attached great importance to these agonistic victories, and it was singular to note the frequent recurrence of such scenes in their sculptures. When we examine the subjects of the friezes on these tombs we find that they possess in common this general feature,—that the principal subject is a battle scene, or something else strictly personal to the life of the deceased, the figures represented as mourners being subordinated to the others, as if mourning were the least part of what was due to the dead. Without doubt the main idea which dictated the subjects of the sculptures was that of pleasing the dead, as well as cheering the living. In the Chimæra Tomb in the British Museum, Bellerophon was represented on both sides of the structure, in his chariot of four horses driven by a charioteer. The Chimæra was under the feet of the horses, and Bellerophon was aiming at it with his spear. That was not the ordinary way in which this subject was represented. The ordinary representation made Bellerophon a horseman, mounted on the famous winged horse Pegasus, and attacking the Chimæra with a lance. At first sight it might, perhaps, be thought that the representation of Bellerophon, in a four-horse chariot, represented a version of the myth peculiar to Lycia, but the lecturer was not inclined to think that was the case. The principal points of this myth of Bellerophon were made up from several sources. First of all there was the story, well known to Greek scholars, told by Homer, which dealt chiefly with Bellerophon's adventures in Lycia. Then again there were the myths which connected him with Corinth and Sicyon. Now a constant, and, indeed, perpetual type on the silver coins of Corinth was the Pegasus, while on the coins of the neighbouring city of Sicyon a constant type was the Chimæra. Corinth claimed descent from Bellerophon. According to Apollodorus, Bellerophon was the son of the Corinthian King Glaukos, and grandson of Sisyphos, or, according to another myth, son of Poseidon. He committed a murder, then fled to Proetus, King of Argos, whose wife, Antea, fell in love with him, but her advances meeting with no response, she made a false accusation against him, and demanded that he should be put to death. Proetus sent him to Jobates, King of Lycia, whom a female brings an offering. On his other side is a smaller draped male figure. Two tombs excavated in the rock at Telmessos,—one having a Doric and the other an Ionic façade, having been referred to, the lecturer suggested that the interior arrangement of these rock

against the Amazons. He was victorious in both those contests, and on his return, being attacked by an ambuscade contrived by Jobates, slew all his foes, the bravest of the Lycians. Homer described the later life of Bellerophon, saying that he drew on himself the hatred of the gods and wandered through the Aleian plain. It should be noted that although Homer did not mention the story of the Chimæra slain by aid of Pegasus, the myth occurred on coins, gems, terra-cottas, and Lycian reliefs. Bellerophon was stated to have assisted Proetus in his claims on the Kingdom of Argos. The Lycians were said to have made those remarkable Cyclopean fortifications at Tiryas. On the coins of Sicyon the Chimæra was represented to be a monster having the head of a lion, the body of a goat, and the tail of a serpent. Similar representations had also been found on vases and monuments. Such a representation of the Chimæra was to be seen on an archaic terra-cotta now in the British Museum. According to one legend, the monster breathed forth fire, and Bellerophon destroyed it by passing lead into its mouth, the lead becoming melted by the breath of the beast, and being swallowed. In reference to the origin of this myth of the Chimæra, it should be noted that a commentator on Virgil mentioned the existence of a mountain in Lycia which had a volcanic fire and which was frequented by lions towards the top, by goats in its middle parts, and by serpents at its foot. Other ancient writers spoke of fire on a mountain on the eastern coast of Lycia, and of a temple dedicated to the god of fire, but little more light was thrown upon the subject until Sir Francis Beaufort surveyed the coast of Lycia. Being not only an extremely good hydrographer, but a very well-read man, Beaufort was induced to look out for the fire on the mountain spoken of by the ancient writers, and he succeeded in finding it, issuing from a fissure in the rock, which exhibited marked evidence of what geologists called Plutonian disturbance. The fire was afterwards seen by Spratt and Forbes. Forbes, who was a geologist, was of opinion that the gas which supported combustion at the fissure may have been evolved by the collision of limestone with Plutonian serpentine and stated that in the Apennines the same phenomenon occurred with the same geological formation. Another traveller, Mr. Albert Berg, a German artist, who was sent in 1854 by the King of Prussia to examine the fire and make drawings of the site, had published an interesting account of this fire in the *Zeitschrift für Allgemeine Erdkunde* for 1866. It was not difficult, by the light of these authorities, to come to the conclusion that the Chimæra was a monster suggested to the fertile Greek imagination by natural phenomena. Reverting to the tombs themselves, the lecturer mentioned one at Myra with a *block-haus* façade. It consisted of an ante-chamber cut in the rock, within which was an inner chamber, constituting the tomb itself. On entering the ante-chamber the following reliefs were found,—on the left, a male figure bearded, and holding in one hand a drinking-horn, in the other a cup (Texier, pl. 230). This figure, in the facsimile in Fellows ("Lycia," p. 198), is painted,—the body a flesh-colour, the lower half draped in a violet mantle, the ground red. Next to him, and close to the door leading to the inner chamber, is the figure of a boy, quite naked, holding in his hand a stick, and with his head shaved all but a tuft (Texier). On the opposite side of the ante-chamber is a seated female figure, behind whom stands a female attendant, in front of whom stands a naked youth, holding in his left hand a astrigil and aryllos. His head is shaved all but a tuft (Texier, pl. 239). The ground on which this group is relieved is painted blue. The figure of the youth has the natural colour of flesh. The female figure wears a red chiton and a mantle, in which white, violet, and saffron are combined. The female attendant has a white chiton and yellow mantle (Fellows, p. 198). Outside the tomb, on the left, is a bearded male figure, the lower half draped, and holding in his right hand a sceptre sculptured on the rock. On the right of the entrance outside is a draped female figure, holding by the hand a smaller female figure (Texier, pl. 231). At right angles to this group is a male figure leaning on a staff, to whom a female brings an offering. On his other side is a smaller draped male figure. Two tombs excavated in the rock at Telmessos,—one having a Doric and the other an Ionic façade, having been referred to, the lecturer suggested that the interior arrangement of these rock

tombs might throw some light upon the probable internal arrangement of such structures as the Tomb of Mausolus. The evidence afforded by the tombs of Etruria and other parts of Italy was also useful in this connexion. At Tlos, a city of remote antiquity, situate near the River Xanthos, and discovered by Sir Charles Fellows, there was a most interesting tomb with a tetrastyle portico, which was curiously left unfinished. Inside the portico, on the left hand, was a relief, also unfinished, having for its subject Bellerophon slaying the Chimæra, and there were animals on each side of the doorway. Tlos or Tros was said to have been the progenitor of the Trojans, and there must have been some connexion between the Trojans and Lycia; for Homer told us of two Lycian heroes, Glaukos and Sarpedon. A rock-tomb at Pinara was next described. It had a pediment and portico. On the right-hand side was a seated female figure receiving something from an attendant. On the left-hand side were three standing figures. Below the dentils was a frieze; on the left a mounted figure, and several figures in front and behind him; on the right, figures apparently dancing, or warriors escorting captives. Inside the portico, on the opposite walls, were views of cities (Fellows, p. 141). According to Spratt, the ruins of Pinara are the most considerable in Lycia. The Lycians, according to Stephanus, called all round things "Pinara," and Spratt reports the existence of an almost cylindrical hill there. Pinara was a colony from Xanthos.

Professor Newton's next lecture, to be delivered this Friday, the 8th inst., will be on the great inscribed stele of Xanthos, of the four sides of which there are casts in the British Museum.

POLICE AND FIRE BRIGADE STATIONS, NEWCASTLE-UPON-TYNE.

WE illustrate this week the design placed first by Mr. Worthington, the architectural assessor retained by the Committee to advise on the merits of the drawings sent in for this competition. The instructions to architects were for a combined Police and Fire Brigade Station, with residences for two superintendents and barrack accommodation for constables and firemen above; the cost of the building not to exceed 7,000*l*.

The amount of accommodation required, and the limited area of the site, necessitated the utmost economy of space in the internal arrangement of the building. The Fire Brigade portion of the building is designed with a view to general convenience and a quick dispatch in case of fire.

The building will be carried out in red brick with stone dressings, and will be roofed with Westmoreland green slates.

Mr. A. B. Gibson, the author of the design, has received instructions to complete the working drawings, and the building will be commenced in the early part of the year.

The other design which we illustrate was submitted under the motto "Ad Rem," and was selected for the second place, conjointly with that of Messrs. Clark & Moscrop, of Darlington. In the Fire Brigade Station, on the first-floor, are placed apartments for married and single firemen, baths, and lavatories. On the basement are the laundries for both departments, &c. The roof is an asphalted flat for drying the hose, above which rises the watch tower which is a feature somewhat necessitated by reason of the hose hoist.

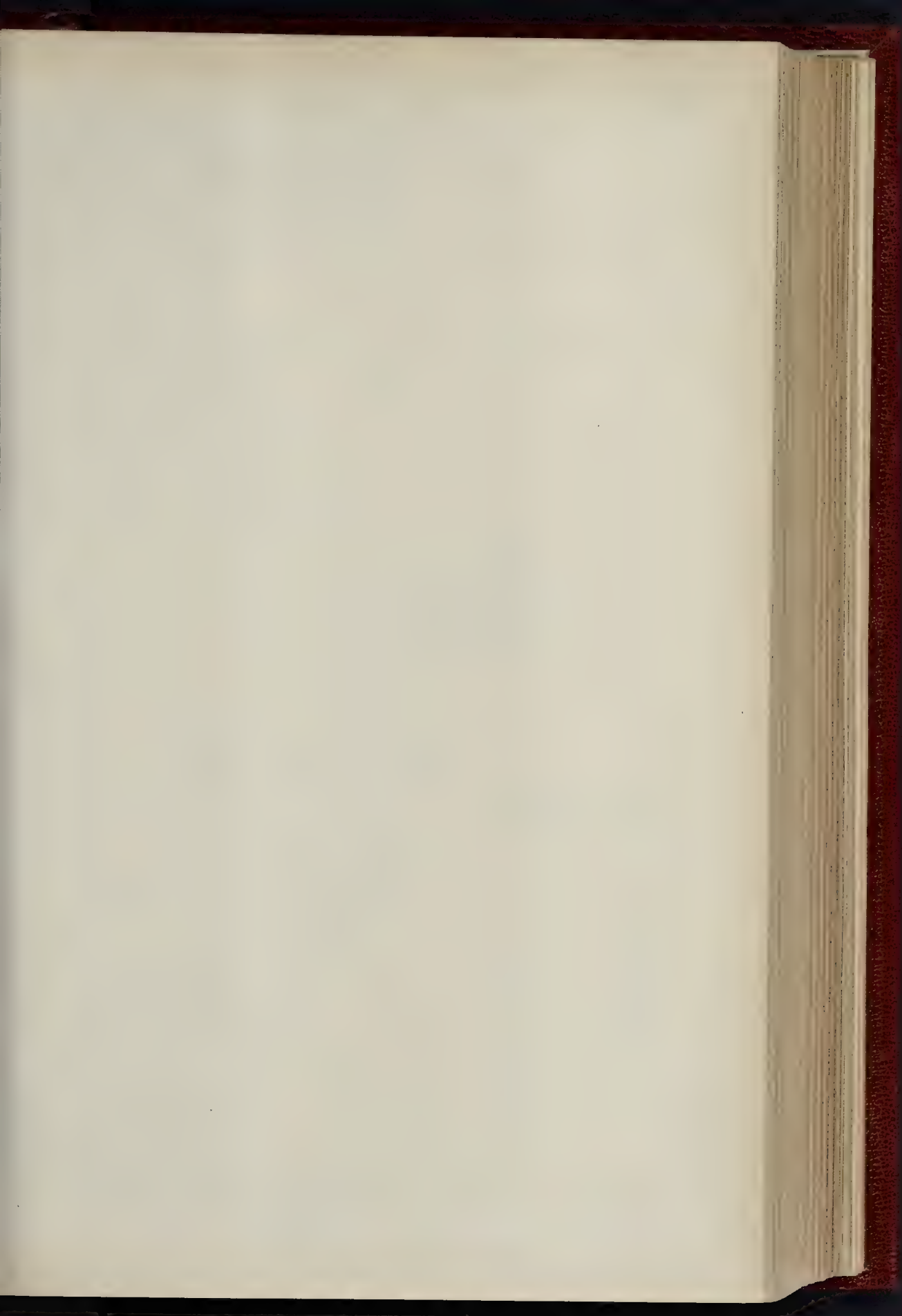
In the police department, on the first floor, is the general mess-room and its adjuncts, billiard-room, library and sitting-room, and cleaning-room, with bed-rooms in the attic.

THE EASTER SEPULCHRE IN HECKINGTON CHURCH.

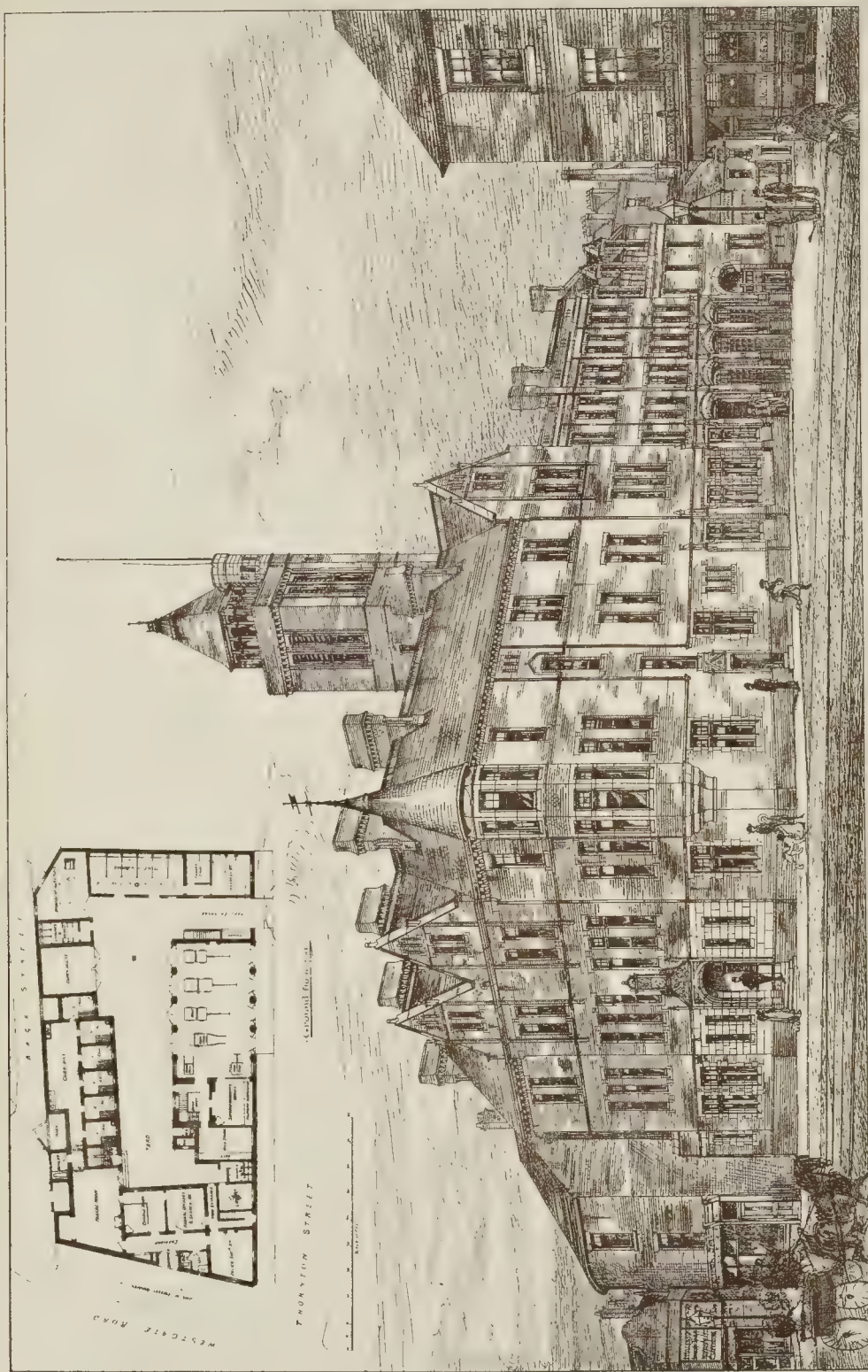
THIS Easter Sepulchre possesses special interest, apart from the comparative rarity of examples in England, in its great elaboration and unusual design. The artist seems to have purposely disjointed the architectural features of the upper part in order to emphasise the value of the long flowing lines in the foliage. The crockets and small grotesques are very similar to the carvings on the screen at Lincoln Cathedral, a likeness which the figure-sculpture does not possess.

* The remainder in our next.

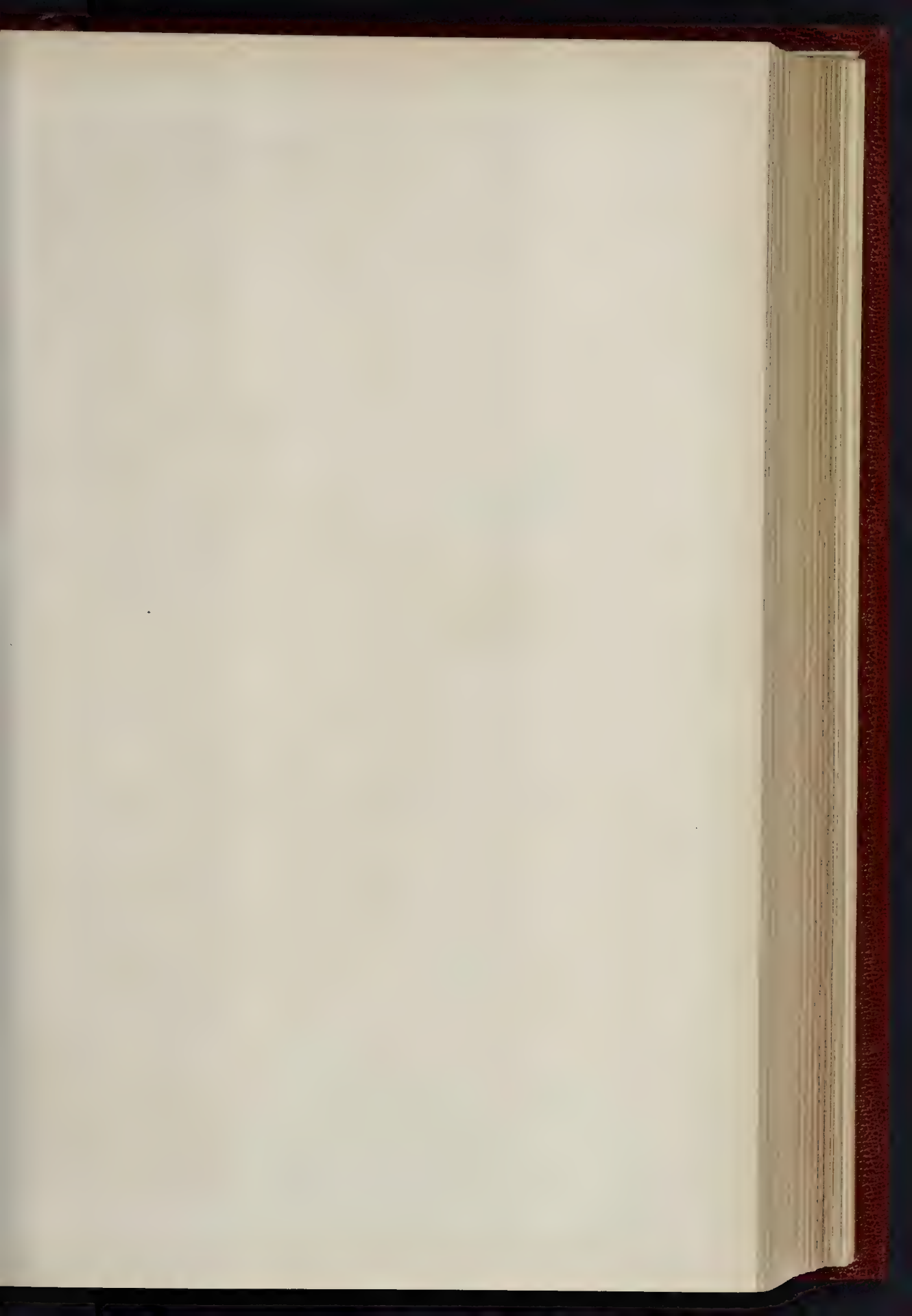
† See *Builder*, pp. 92, 142, 181, ante.



THE BUILDER, FEBRUARY 9, 1884.



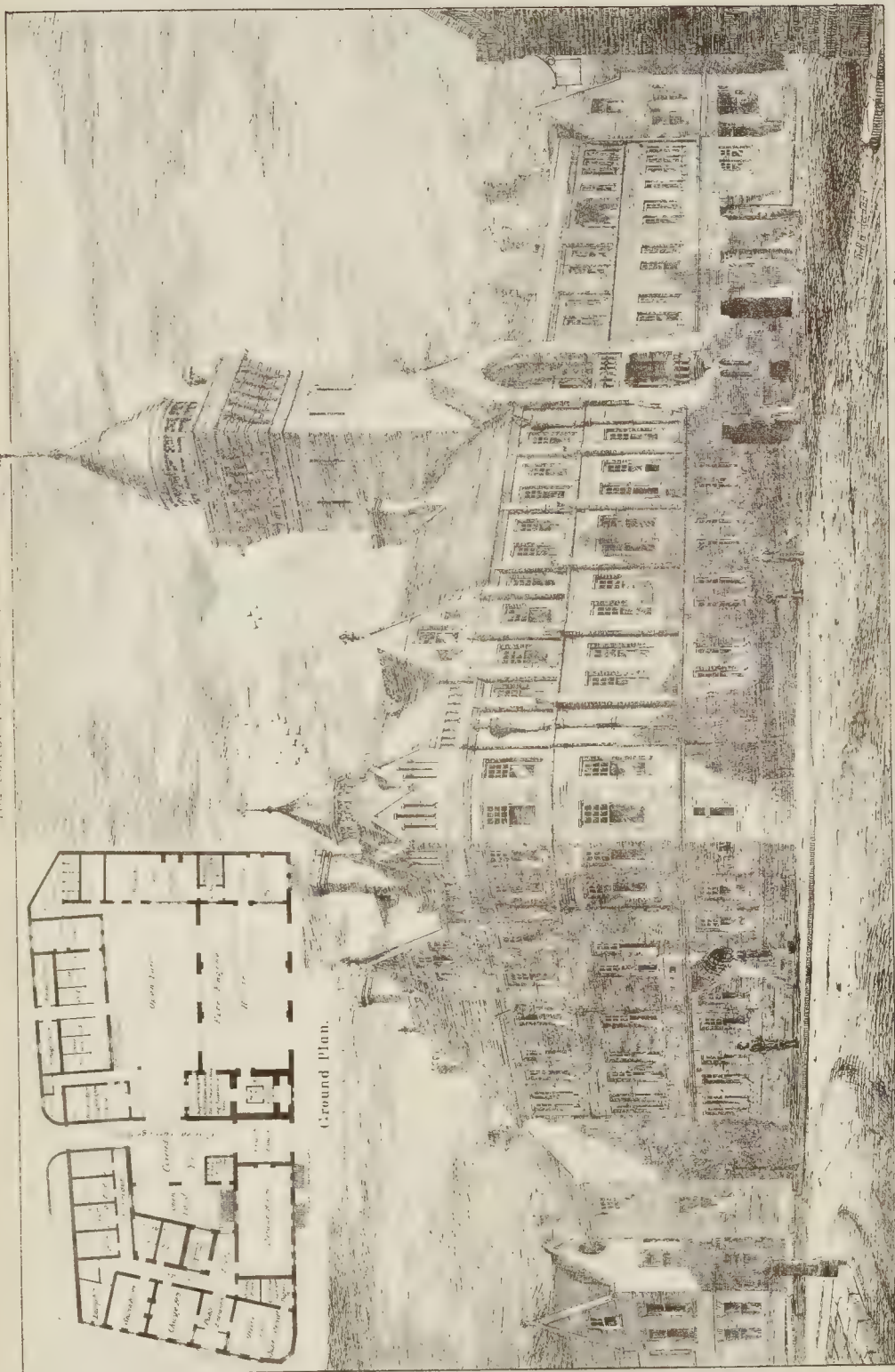
* Newcastle-upon-Tyne. Police and Fire-Brigade Stations. First Premiated Design. Mr Arthur B. Gibson. Architect *



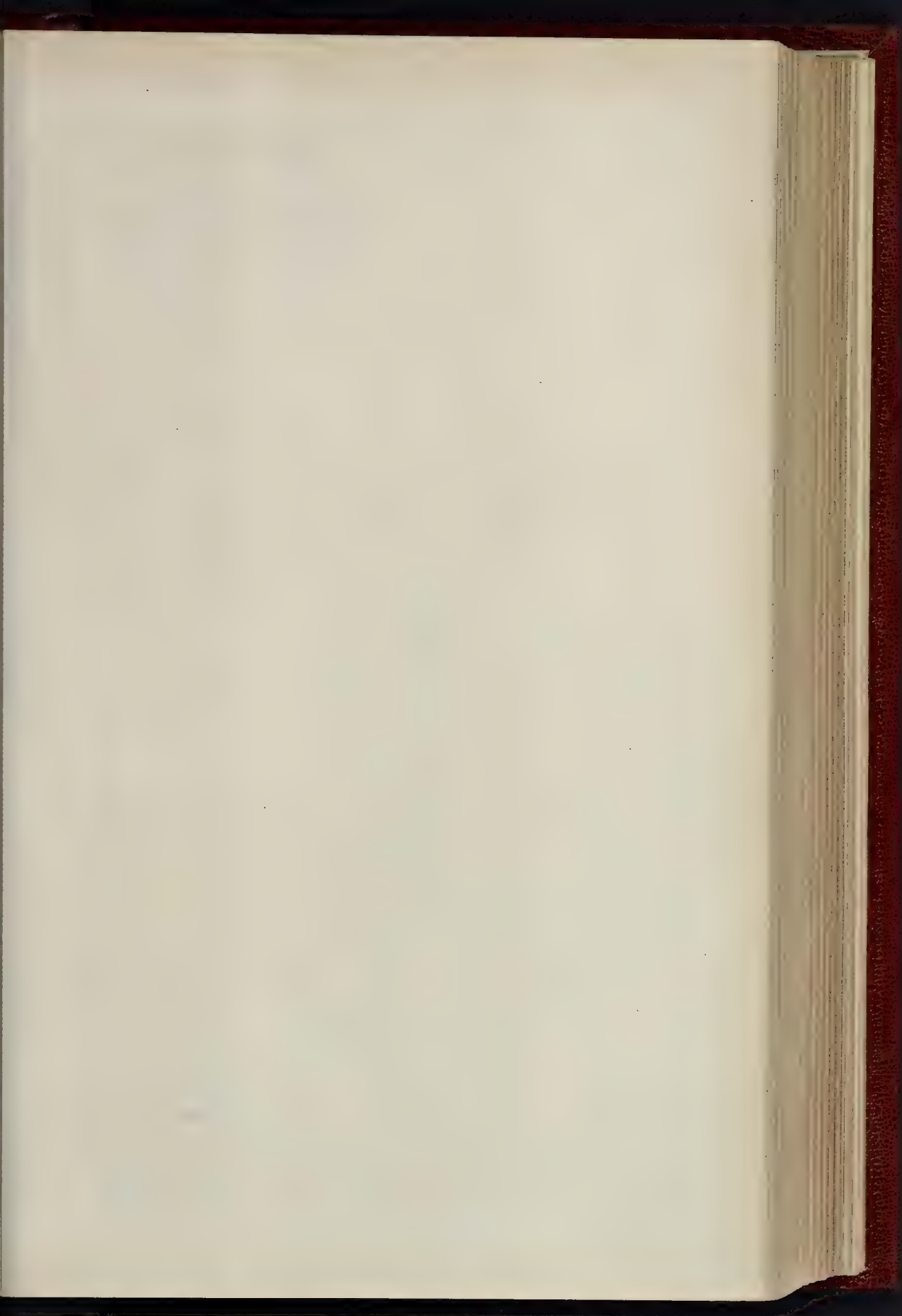
THE BUILDING, FEBRUARY 9, 1883



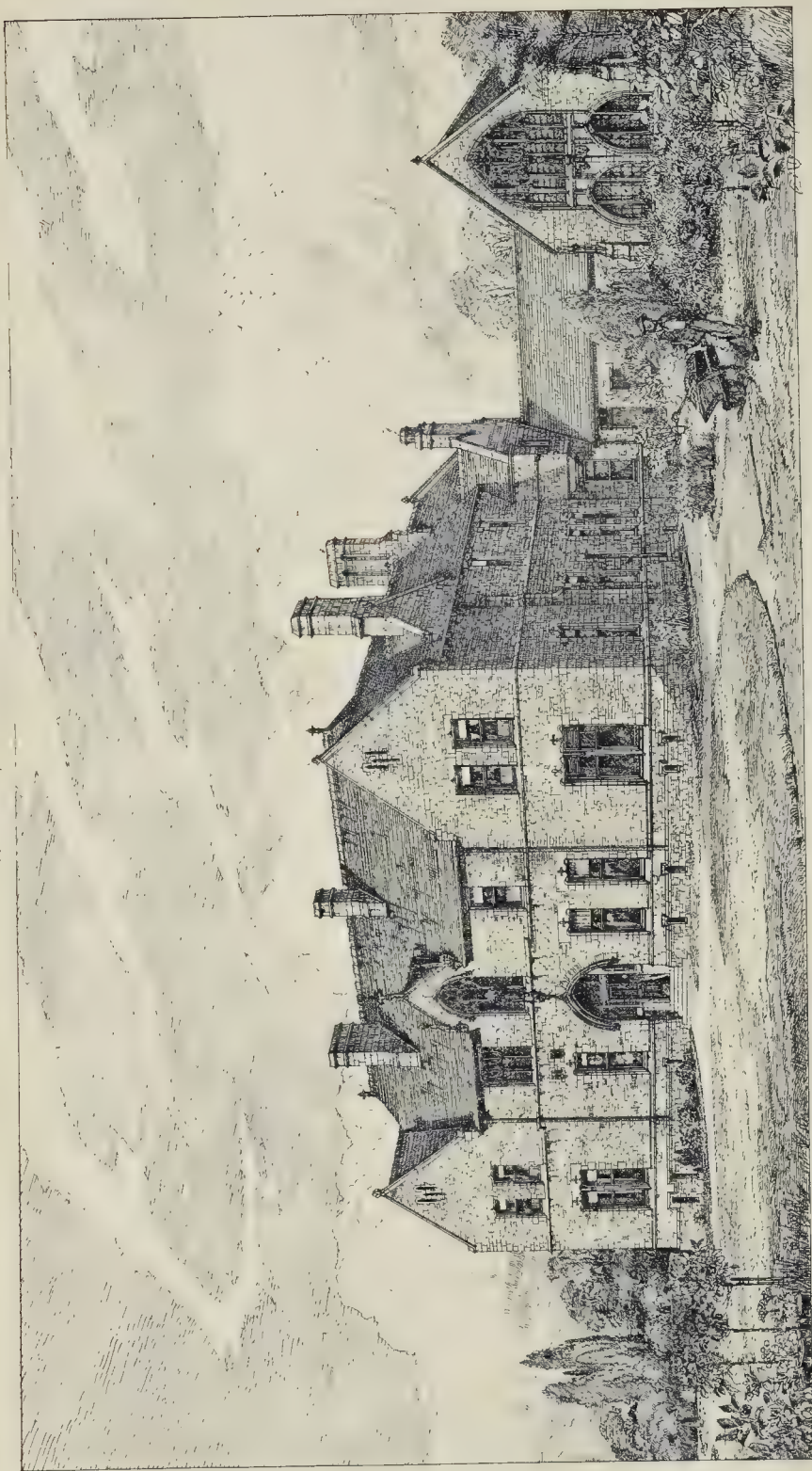
Ground Plan.



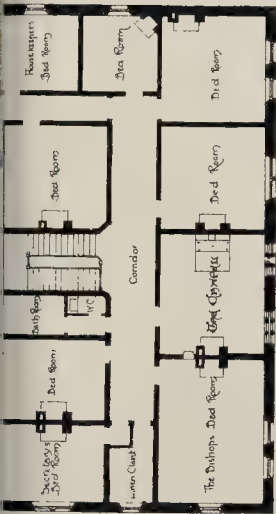
THE BUILDING, FEBRUARY 9, 1883



THE RUILDER, FEBRUARY 9 1884



House for The Rev. A. Riddell, D.D.



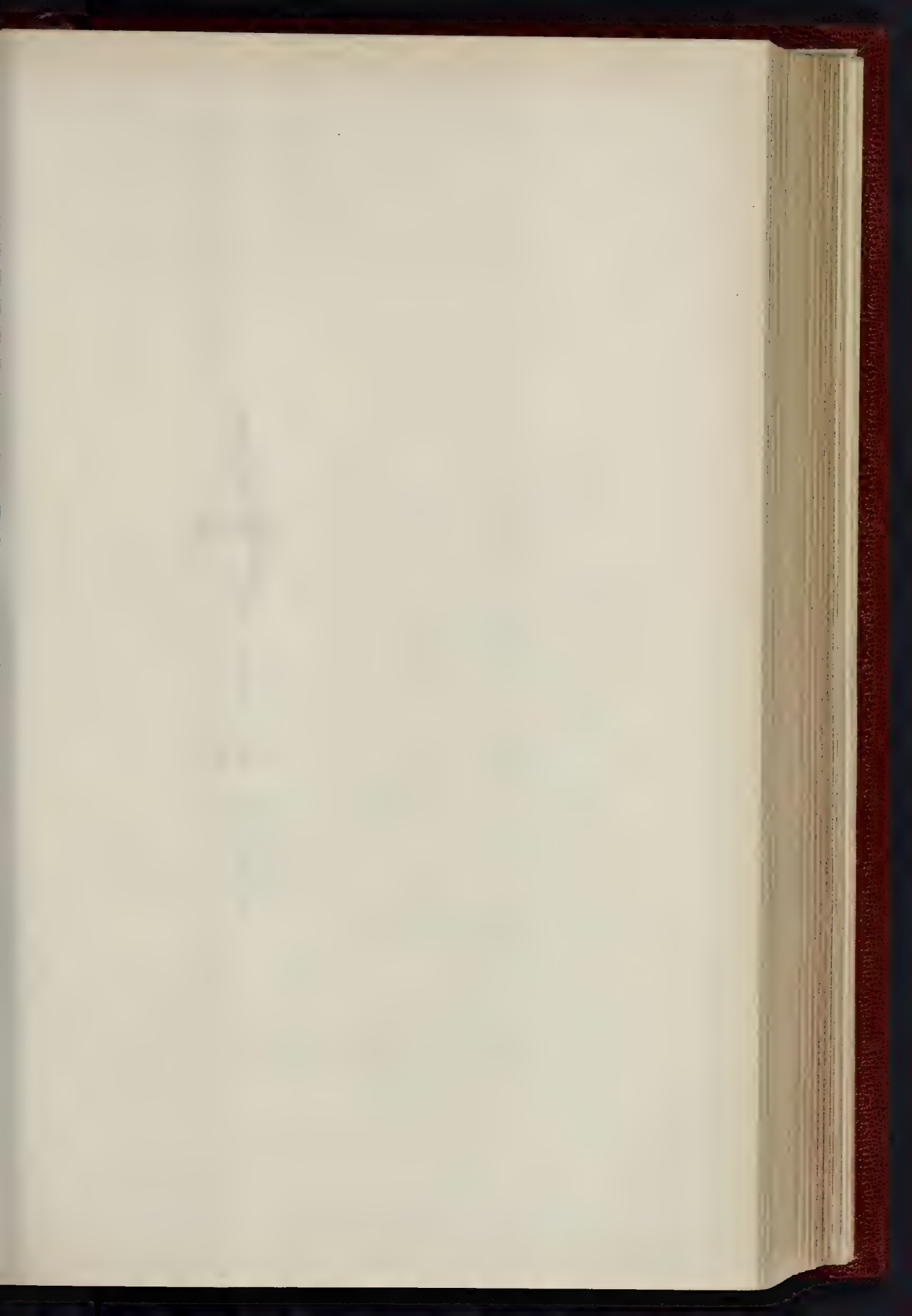
GROUND FLOOR PLAN

SCALE OF 10 20 30 40 FEET

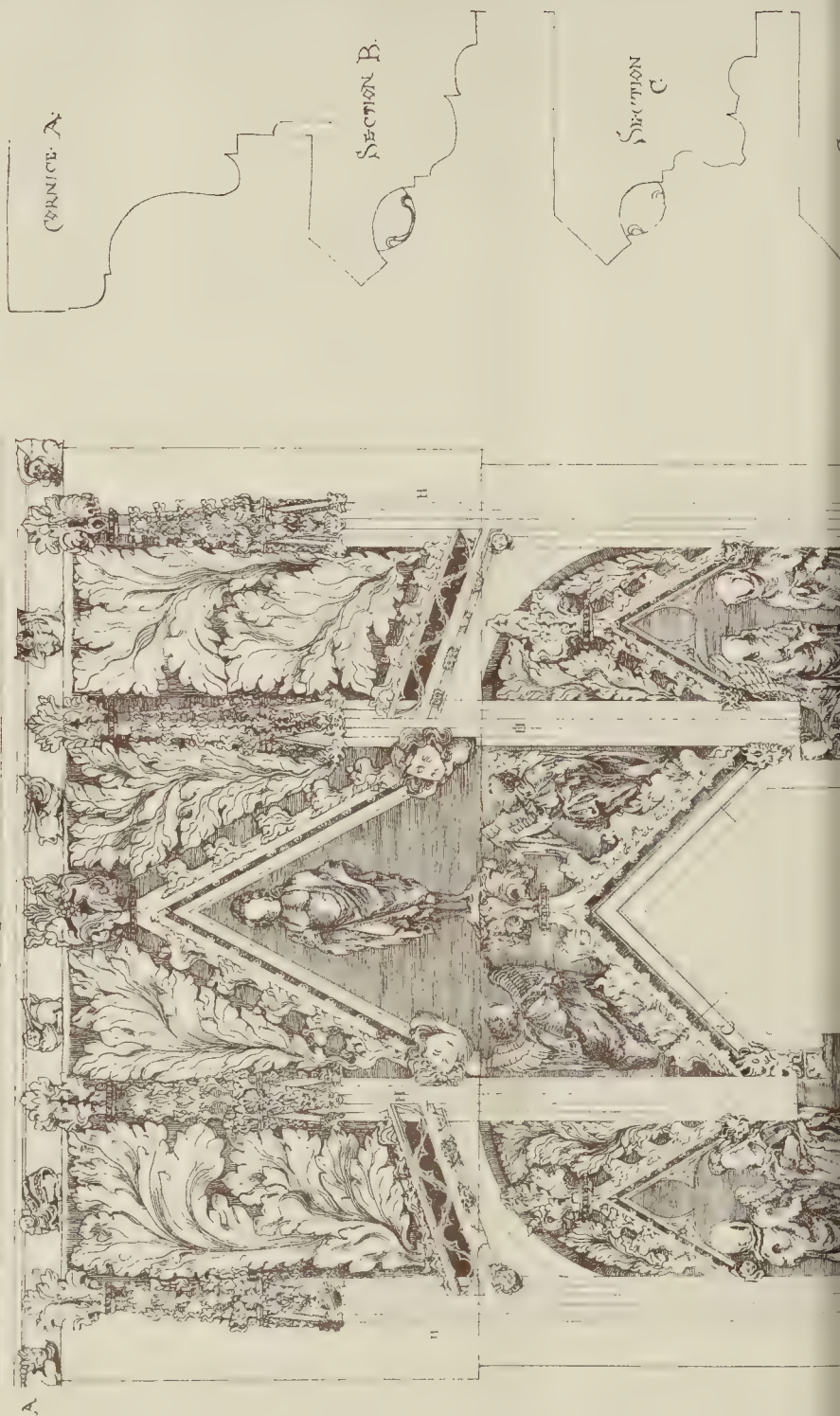


MRS J NICHOLL Architect
1 Conisbary Road NW

GROUND FLOOR PLAN



THE HASTERS SEPULCHRE.
IN HUCKINGHAM CHURCH, LINCOLN'S.

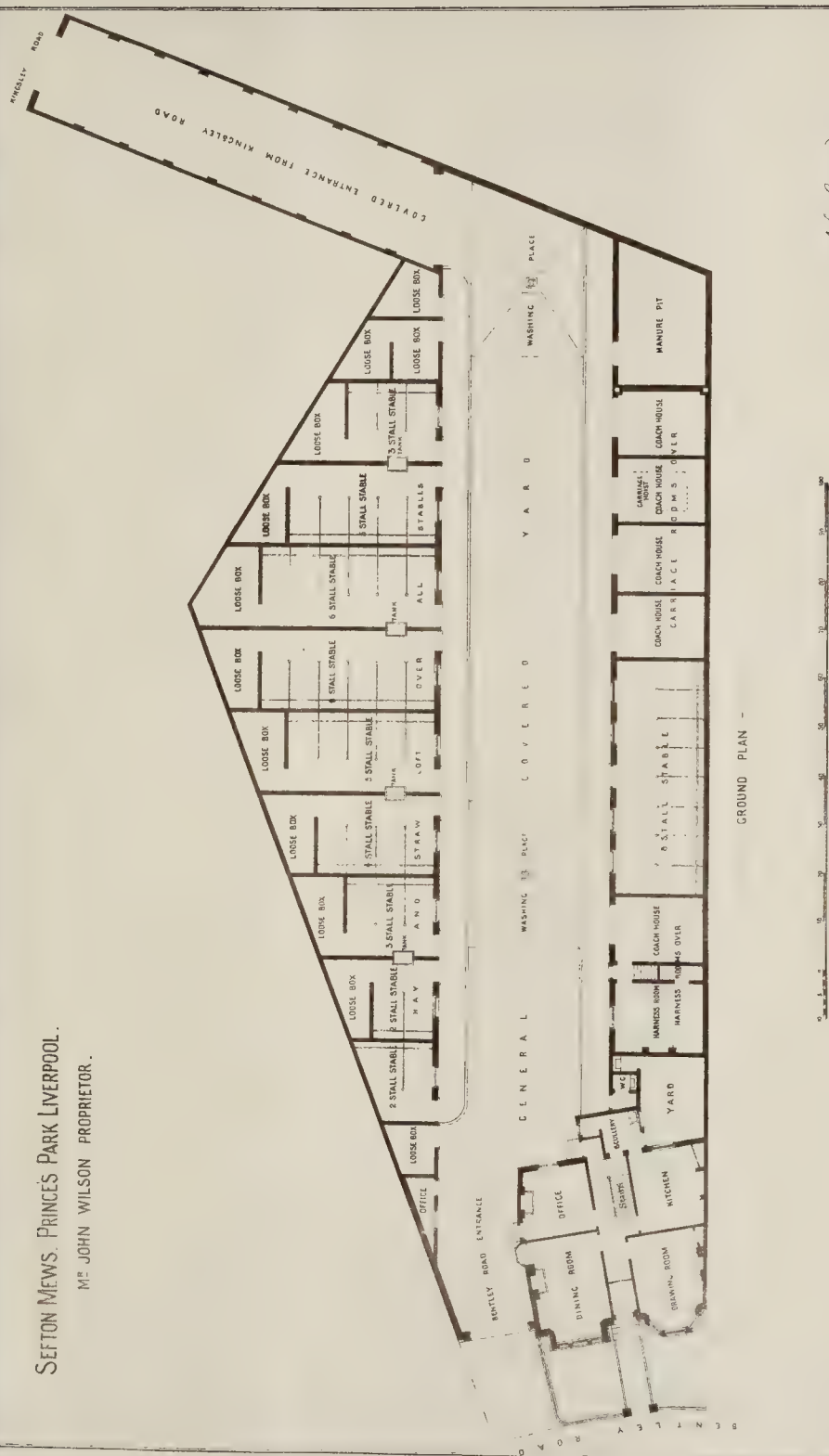


MR. JOHN WILSON PROPRIETOR.

Anne E. Spivey
Archibute 25 Church Street
Liverpool

WYMAN & SONS PHOTO LITHO

Geon S' London, WC



GROUND PLAN -



WYMAN & SON'S PHOTO-LITHO

SEFTON MEWS, PRINCES PARK, LIVERPOOL.—MR. JOHN E. REEVE, ARCHITECT.

© Queen St London W.C

THE BISHOP'S HOUSE, NORTHAMPTON.

The house now in course of erection by the R.C. Bishop of Northampton, as a residence for himself and his successors, has been carefully designed upon lines laid down by the Bishop, after due consideration of the wants of the diocese. The site, which has been newly purchased, adjoins the Cathedral grounds. The house is so planned that the principal rooms face the south and west, and will be connected with the cathedral by a cloister and sacristy for the Bishop, shown in the view, but not yet commenced.

The rooms are spacious and lofty, the ground floor being 12 ft. 6 in. in clear height. The floor-line is raised well above the ground-line, and the whole area is provided with a basement, and covered with concrete as a security against damp. The walls are thick-faced with local stone, and lined with brickwork; the roof will be tiled; the corridors are to be paved with tiles, bedded on concrete arches, the whole construction being of the most solid and durable nature.

A general effect has been aimed at in the design which would be well in harmony with the cathedral and adjoining convent, but with a more domestic character. The chapel is marked on the exterior by a concentration of ornament, and the whole of the detail and fittings of the interior have been specially designed in the same spirit.

The general contractor is Mr. Robert Finnegan, of Northampton; the contractor for the masonry, Mr. F. G. Anstey; the clerk of the works, Mr. P. Shaw. The whole is being carried out from the designs and under the superintendence of the architect, Mr. S. J. Nicholl.

NEW STABLES, SEFTON PARK, LIVERPOOL.

ONE of the many petty worries of fashionable life is the administrative paraphernalia connected with "keeping a carriage." The bother of the horses periodically falling ill, each time on the very day you most especially wanted them; the anxiety of damaging the market value of the beasts by late hours in the cold and wet; the high jinks of an intemperate or dishonest coachman (recommended to you, doubtless, as an A 1 in the coachman world); the mysterious and expensive ways of forge-contrabactors, veterinary surgeons, and livery-stables, all make up a sum total of botheration and annoyance which hundreds of people have found quite past endurance.

This has led many gentlemen of average means to buy their own vehicles and have them housed and attended to at livery-stables. The animals are guaranteed to be always in good health and at hand, the men likewise; and the yearly cost can well be, for obvious reasons, much under that of amateur horse-keeping, and yet yield a good profit to the stable-keeper.

What is, however, wanted in order to let the public have a fair trial of this less harassing and more economical way of keeping a carriage is for large livery establishments to be built in the various centres of fashion, specially designed for the particular work required. The experiment, we hear, is being tried in Liverpool on its scale by Mr. Wilson, a well-known horse-dealer of that town. He has erected for the purpose a building, of which we give this week an illustration of the ground-plan and a view of one of the elevations. It is situated in the Sefton Park district,—the Belgravia of Liverpool,—so the site is a good one for the undertaking. Some idea of the size of the structure may be gained by the fact that the floor-space covers over 4,000 square yards. The carriages are taken up on a lift to the first floor, and the conveniences for doing so are such that the chieftains will keep their smart newness much longer than they possibly could in any ordinary private town coach-house.

Full dressing-room accommodation has been provided for the staff of men who are going to perspire the troublesome "family coachman," and we understand that a firm of tailors in the way has contracted to supply, not simply a new pair for each of them, but an assortment of liveries for gentlemen to choose from, so that each customer can have a distinct family livery.

The stables are furnished, it is believed, with every fitting and modern improvement which has yet been brought out. Amongst these may

be noticed the method of water supply. Between each stable, in the inside thereof, is an open tank, built half in the thickness of the wall, from which the men obtain water direct, without splashing or loss of time. These tanks are all served from a central one. By the arrangement the water reaches the horses at an average level temperature throughout the year, which is a most desirable thing to secure.

The buildings were designed by Mr. John Elliott Reeve, architect, of Liverpool, and the entire work has been recently carried out under his superintendence.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of this Institute for the present session took place on Monday evening last, Mr. Horace Jones, the president, in the chair.

The late Mr. J. H. Parker.—Mr. Macvicar Anderson (hon. secretary) said that since they had last met a well-known name had been removed by death from their list of members. It was not customary, nor was it his desire, to enter into any particulars or details, but it would not be seemly if a man so well known as John Henry Parker were to be allowed to pass away with merely the usual official obituary announcement. Mr. Parker was born in 1806, and succeeded to the business of his father as bookseller and publisher in Oxford. In 1836 he published a book known to all students of architecture,—the "Glossary" of English Architecture,—which showed a vast amount of industry and research. This was succeeded by many other works in subsequent years. Mr. Parker at the time of his death was President of the Architectural Society of Oxford, Vice-president to the English and American Archaeological Society of Rome, and was one of the very few Honorary Members of the Institute. Thus had closed the career of one who, in his day and generation, had done much good for the increase of knowledge in connexion with architecture and art. It was with great regret that he had to announce the decease of Mr. Parker.

English Travelling Studentship.—The Chairman announced that the English Travelling Studentship had been awarded to Mr. Joseph Gibbons Sankey, 36, Maitland Park, Haverstock-hill, there having been seven candidates.

The Godwin Bursary.—It was also announced that the Godwin Bursary had been competed for by 36 candidates, and had fallen to Mr. Frederick Richard Farrell, 32, Craven-street, Strand.

This Year's Royal Gold Medallist.—The Chairman said that the Council proposed to submit the name of Mr. Wm. Butterfield, architect of All Saints', Margaret-street; of Keble College, Oxford, and various other colleges and domestic buildings, to her Majesty the Queen, as the recipient of the Royal Gold Medal for the current year. While honour would be conferred upon Mr. Butterfield in receiving the medal, he would also confer honour upon it, and upon the Institute, by accepting it. [The announcement was received with much applause.]

REVIEW OF THE EDUCATION AND POSITION OF ARCHITECTS IN FRANCE SINCE THE YEAR 1671.

Mr. William H. White, Secretary of the Institute, then read a paper bearing the above title. He said that although much had been done to establish academies in France before Jean-Baptiste Colbert became Minister of State, he was still considered to be the founder of the academical system, which had passed scatheless through periods of monarchical disorder, general confusion, and revolutionary tumult, which had been overturned for a time, set up again by the nation, consolidated by successive reforms, and recently developed by wise and generous measures. The French Academy was instituted in 1635 under Cardinal Richelieu, but to Colbert was due the Academy of Inscriptions and Science, and he first established the Academy of Architecture. In 1661 the French king ordered that prizes should be given to those who succeeded best, promising that a certain number of young men should be sent to Rome at the royal cost, and who, on their return, should be employed upon the royal buildings. At the same time he commanded that through the means of public lectures the sciences necessary to the study of architecture should be taught, and what these were must be learned from an examination of

Blondel's course of lectures. When they remembered the state of French and English society in the latter end of the seventeenth century, and what was the condition of the great mass of mankind in the different countries of Europe, it was impossible to regard the literary performances of Blondel, Perrault, Félibien, and others, with other than sentiments of admiration and humility. The acknowledged excellence of many of the public buildings, executed throughout France during the seventeenth and eighteenth centuries was largely due to the influence of the Academy of Architecture, and to the wise control exercised by successive Ministers of State. Nowhere was this better shown than in the orders to Perrault to report, amongst other things, upon the quality of the stones used in the churches of Paris and its environs. So thoroughly had this been done, that M. Viollet le Duc had stated that time had only confirmed the observations made in the Academician's report. Mr. White next referred to the charters of the Royal Academy of Architecture in 1717 and 1776. A generation of *rococo* had come and gone when Voltaire wrote his famous letter, "Des Embellissements de Paris," in 1749. Nevertheless, the architects were neither unskilful nor inactive, though the style might be burdened by misplaced ornament, and the Academy was producing no better adaptation of ancient architecture than it had hitherto done. It was recorded that in St. Petersburg, Berlin, and other places, the principal architect was then a Frenchman. The fresh lease of the patent presented to the Academy in 1775 declared that it should be composed of Academicians who were architects, of Associates who should be non-professional, and of Correspondents or Associates who should be both native and foreign. The Academicians were divided into two classes, each of sixteen members, the Hon. Associates to be sixteen, chosen from persons who, without professing architecture, were distinguished by their knowledge of it or the allied arts, and a rank was allotted to them between the first and second classes of Academicians. The Revolution, which suppressed all academies, served to restore the development of French supremacy in the arts. On the 23rd of August, 1795, the National Institute of France was founded by a decree of the Republic. It was to be composed of 144 members residing in Paris, and the same number of Associates scattered over the provinces. In 1816 the *École des Beaux-Arts* was organised. Each academy was allowed independent action and free disposal of its grants. Since then the Institute of France had consisted of five academies, one of which was the Academy of Fine Arts, which was composed of fourteen painters, eight sculptors, eight architects, four engravers, with ten important Academicians, ten foreign Associates, and a corresponding Secretary. In course of time the Government, recognising the necessity of possessing some central institute in which architecture could be taught, set apart certain rooms in the Collège des Quatre Nations. The *École des Beaux-Arts* may be said to date its existence from the beginning of this century, when the present buildings were commenced. The Ordinance of Louis XVIII., which determined the rules of the new school, divided the section of Architecture into two classes, leaving the direction of the school in the hands of the Academy of Fine Arts. This lasted until 1863, when a decree of Napoleon III. virtually separated the school from the Academy, setting up the former as an independent institution under the immediate control of the State. The adjudication of the Grand Prix de Rome was taken out of the hands of the Academy, and had to be decided by nine members for painting, nine for sculpture, nine for architecture, five for plate-engraving, and five for engraving of medals and gems. Mr. White next quoted the rules of the schools. The section of architecture was divided into two classes, without a limit being put on the number of students. A diploma was granted by the school, and for the Grand Prize of Rome only Frenchmen were allowed to compete. The conditions were very simple. In March of every year a preliminary trial took place, the candidates having to make a sketch in twelve hours. From the best of these sketches the jury selected twenty-five, who had to undergo a second ordeal, consisting in making another sketch in twenty-four hours. From these last ten were chosen, entering *en loge* for several days. Three candidates were

then premiated, the first obtaining a gold medal and leaving early in the following year for the Academy at Rome, while the other two also gained medals. At Rome the student had a bed-room and private studio allotted to him. He was compelled to conform to the rules of the Academy, and to submit to the orders of the director, but so long as he fulfilled his obligations in the matter of drawings, little restraint was put upon his actions. On the return of the student from Rome he got professional employment in some of the public buildings in course of construction. Mr. White continued that he had been describing a system of organisation totally foreign to this country. It might be said that the Great Prize of Rome could be gained by only a few men, and that it was in most cases a chimera to those who competed for it. Yet the pursuit of this chimera kept 500 students on the benches of the schools for ten years, and those who did not succeed in gaining the Grand Prix found themselves good painters, good sculptors, and good architects. The student at Rome also made what our grandfathers called the "Grand Tour," and brought back in his portfolio not mere bright-coloured sketches, but genuine architectural drawings, such as delighted the English masters of an earlier day. The advantages of the system were patent, and the magnificent results could be judged by a study of the national edifices of eminence in France. Many people in France, and a much greater number in this country, were satisfied that state-supported academies and schools were mere derelicts of Protection; but, to his mind, the difference between a body of architects under the Academy system which had flourished in Paris, and those left to pick up knowledge in a speculative scramble for employment, was not unlike the difference between an army of soldiers fit to take the field, and a scratch gathering of men with muskets. If any plea were needed at the present time in favour of English architects possessing early in life a scholarly acquaintance with the French tongue, it might be found in the existence of the splendid literature which during the last 250 years had helped to raise France to artistic eminence; and it might be found in the pleasure and profit to be derived from the true appreciation of the fine understanding, the polite consideration, the charm of manner, with which men of science and letters in that country treated the noble subject of architecture. On the other hand, if anything could add to the depression which a reference to architecture occasioned amongst similar kinds of people in England, it might be found in the avowed opinions of many eminent men, successful in their own walks of life. In France each Academy in turn presided over the whole Institute, M. Gounod, the composer, being president last year. Men of science and art occupied a position in France to which there was nothing comparable in this country. This had grown out of the system which had prevailed for two centuries, by which the monuments of Greece and Rome had been brought to the knowledge of Frenchmen, and had conferred upon them an inheritance which enabled the little Republic to divide with Imperial Rome the homage of the modern world.

The Chairman, in inviting discussion, said that the paper they had heard was a charming, complete, and comprehensive essay. Embodying as it did so much in so small a space, it would afford the members plenty of room for thought and consideration.

Mr. R. Phené Spiers considered it would be valuable to go slightly more into detail as to the operations of the French Academy, in which he had studied in France, with regard more especially to the peculiar system organised there for the teaching of students in architecture. Mr. White had, perhaps, not drawn sufficient attention to the question of the free ateliers. Mention had been made of certain free ateliers which had been started probably with the cognisance of the schools. The students in many cases clubbed together and appointed a patron of their own. The patron of the atelier to which he belonged succeeded to another, and other ateliers were formed, and in 1863 there must have been as many as twenty. These had no recognition in the school except that students were allowed to add to their names at the bottom of their drawings "Pupil of M. So-and-So." Every student was permitted to study where he liked, but in making out a complete

design the student had to attend *en loge*, and in the course of twelve hours to complete the design, taking a tracing to work out in the atelier of his patron, and to obtain his advice on the various modifications. At the same time he was not permitted to depart from the design in any material way. At first sight of a large studio with 150 students, it might seem impossible for busy men to give the time to the students which would be necessary; but that was not required in the French atelier. As there were many men who might not obtain the prize of Rome without studying for ten or more years, there were always in each atelier a number of men of different stages of power. The Professor gave his time only to the seniors, while the seniors gave advice to the juniors, so that there was an accumulated mass of advice. Each man was in friendly rivalry with his brother students, and each atelier was in rivalry with the others, and therefore they all worked together to raise the character of the designs. It was impossible to describe the extraordinary effect of this system of emulation, and no possible mastership in a school could produce such results in so short a time. This year for the first time there had been a competition at our own Royal Academy, somewhat similar to those in the French schools,—the painters, sculptors, and architects competing together for a design for a wall painting; and although the painters were at present too strong for them, he was not without hopes that the prize would occasionally be wrested from the painters by the architect students. One of the great difficulties they experienced in their offices in this country was the absolute ignorance of drawing in the case of the young men at first, but in France this was not so. Almost every young man studied drawing, and in every province there were schools of drawing formed at the expense of the Government, and it was certain that some of the evenings of the student would have been spent there in gaining preliminary knowledge. The result of carrying on the school from the time of Blondel was that the tradition which designs had been kept up,—that tradition which in England was stopped by the death of any of the great masters. Men studied up to the age of thirty, went to Rome, and came back at thirty-five with scarcely any idea of construction beyond the broadest principles, and without any economical knowledge of material. But the Government recognised that the man who had sacrificed so much of his time to the fine arts had a great claim on the assistance of the State, so that he was invariably appointed to some public place where there were clerks of works or building inspectors from whom to pick up his practical knowledge. Mr. Spiers concluded by proposing a vote of thanks to Mr. White for his excellent paper.

Mr. Arthur Cates referred to the recent introduction of the examination for the *Diplôme d'Architecte*. This was a point of great value, and one to which this Institute might well address itself. He hoped when Mr. White's paper was published he would give in the appendix some details of this examination. As long ago as 1854-5 the Architectural Association was much agitated upon this question of the diploma of an architect, the examination being then willing to submit to an examination as to their professional merits and attainments. At that time M. Adolph Lance had published several articles on the subject, and in 1855 Mr. Tite, then president of the Institute, expressed his sympathy with the views of the Association, saying that the members seemed to feel the need of some diploma, as a recognition of their attainments. Mr. Cates then quoted from M. Lance, according to whom it appeared that even in France, as soon as a mason knew how to draw he gave himself out as an "architect." M. Lance repelled most decidedly every proposition which would tend to establish a distinction between the man who was called the purely artistic architect and the architect who was the constructor, and affirming that there was only one architect. The step which the École had taken with regard to the examination for a diploma was one which interested this Institute greatly, because within the last two or three years, after a struggle extending over twenty-seven years, they had listened to the memorial of the Architectural Association, and had established, first, a Voluntary, and now an Obligatory Examination for Associates of the Institute. It had been said, with some scorn, that

it was a "mere surveyor's examination"; but there was not a single item in the whole curriculum which it was not necessary for the architect to be familiar with. He only regretted it was not far more extended, following the lines which were now laid down by the École des Beaux-Arts. Mr. Cates seconded the vote of thanks to Mr. White.

Mr. E. C. Robins said he had lately visited Germany, where he found architecture taught most effectively. There were professors of it, from the fine-art and practical points of view, in every college and technical school, and the drawings he inspected struck him as being of great excellence. Every drawing prepared by the students showed the treatment of the constructional portions, the calculation of the strengths of the materials being put as an appendix at the bottom of the drawing. The result of all this was most satisfactory.

Professor Korr said he would like to move the adjournment of the discussion. A very important national question had been raised, and they had before them two great points, viz., whether in this country something could not be done to advance their organisation as an artistic profession; and, secondly, whether the time had not arrived when they should take a new step in a fresh direction as regards the conditions of an architect.

Colonel Lenox-Prendergast, Hon. Associate, seconded the motion for the adjournment of the discussion, which was carried.

The vote of thanks to Mr. White was then passed, and the proceedings terminated.

THE SANITATION AND RECONSTRUCTION OF CENTRAL LONDON.

This was the subject of a paper read before the Society of Arts on Wednesday evening last by Mr. William Westgarth. Commencing by referring to the insanitary condition and rapid growth of the metropolis, and to the congested state of the central parts, he traced the "chance-medley" process by which its irregular streets were evolved, and argued that, although the London death-rate had been materially reduced of late years by the improvement of the sewerage and other means, better things, even in this respect were to be hoped for. Coming to the subject of "Central London as it ought to be," Mr. Westgarth continued:—

I must content myself with very general remarks on this part of my subject; for, although it may be called the most important of all, as embodying the final outcome of result, it is much too technical in character for any closer treatment at my hands. I speak, however, as a London citizen of long standing, who aims to rise to an adequate idea of all the greatness of his adopted city, and who has been long impressed, and each succeeding year more and more strongly, that its accommodation and its general aspect fall utterly short of the needs of its millions of people, and of its surpassing position in the wealth and commerce of the world.

I have spoken of the hap-hazard direction of our original City thoroughfares. In this comparatively limited area, with which our project has more especially to do, two chief centres stand before us. The lesser of the two, comprising the site of St. Paul's, I would distinguish as the art centre; the greater being, of course, the great centre of the world's commerce as finance which is now indicated as the fertile site of our Royal Exchange and Stock Exchange, of Lloyd's, of the Bank of England, other chief banks, and " Lombard-street," the Mansion-house, and of the City Branch of the General Post-office, with the ever-increasing marvels of its vast business. Is it too much to London to claim that these two chief centres should be connected by the grandest of streets, not merely of London, but of the world? For these centres, but especially from this last business centre, should radiate all the chief thoroughfares of London. Sir Christopher Wren, and others after him, have in draughted plans for a reconstructed London. The Great Fire of two centuries ago might have given a fitting opportunity, but it was availed of. To-day, in attempting the work, would not have quite the same freedom of ideal, for there are not only the many bridges to be considered, but well-nigh a half of great railway stations penetrating

renewing London. The plan of a reconstructed London of to-day must be, therefore, an artistic-economic contest mainly with reference to those bridges and stations.

But let me return for a moment to the great business centre. When our noble St. Paul's has been "unstaffed" by concession of some little more of surrounding breathing-room, when we have the finest of streets running from the noble cathedral to that other centre, what ought we to aspire to as worthy of the latter? Our climate is suggestive of the comfort and convenience, to say nothing of modern possibilities of elegance, of the arcade form of edifice. Repeatedly, as I stood under the beautiful new structure of this kind in central Milan,—constructed, too, as I was told, by English enterprise and capital,—I have asked why London should be so contemptibly inferior in that way. If we, then, are also to have a central arcade, let us hope that it is to excel in magnificence even that of Milan by as much as London excels in population, wealth, and commerce, her fair rival of Northern Italy.

But I have yet another idea with regard to London's grand business centre. It is already, as we have seen, the common meeting-ground of many of our leading city interests. I would complete, as far as might be, this central representative character, by providing accommodation for every kind of institution with which the public were largely or frequently concerned. There would not, of course, be full accommodation for all, but all might "enter an appearance," and the modern facilities of telegraph, telephone, &c., would do the rest. I do not limit this idea to public institutions, such as Parliament, the various Government offices, the legal and judicial, the postal, the customs and excise, and so on. The chief trading interests might be there also, including even hotels, theatres, &c. The railways also, of course, must enter their appearance here, and perhaps adequate subterranean accommodation might permit of a convergence of all the lines to this great centre.

When we have once experienced the incredible business facilities of this centralising office system, we shall look back with amazement upon our present utterly unsystematic scattering of all these public and business interests, and the time and trouble which are thus involved to everybody. Indeed, I have long entertained the still larger idea, in the interests of economies and conveniences of every kind, of bringing together all the chief public offices into one great commodious common edifice. No central site is now possible for so comprehensive a structure, but a near suburban site might still be found, and a special railway service at nominal charges might bring these collective offices, as a whole, much nearer to every citizen than at present. Of course, one hope for this very disturbing idea arises out of a reconstructing of London.

I must now hasten through some other chief considerations of a reconstructed Central London. As we are to indulge in unprecedented width of our chief streets, we may recompense the sacrifice of accommodations in one direction by seizing upon more of them in another; that is to say, by giving a greater height to our new buildings. We have plenty of room both towards heaven above, and in the earth beneath, and the modern facility of perpetually-going lifts will almost abolish wearisome staircases. Let us begin with our subterranean. We must eject all the old poisoned oil, and in so doing, institute a new level of construction. An ample subterranean will give us at once business storage, and the due facility or availing of all the progress of art and science in the future, in our lighting, watering, sewerage, and the application of energy or power in all ways, without the heretofore incessant breaking up, over and over again, of our streets.

Next, we have a lofty ground-floor,—so lofty as to allow, without serious reduction of light, of that floor, a terrace or upper promenade, with bridged connexions for foot passengers, and so as to put an end to those countless street dangers and accidents which already cost to London and its suburbs the yearly sacrifice of 70 lives. This level, as well as that of the round, will have its shops and traffic, to swell to a remunerative rent-roll.

We continue our ascent through successive floors of offices or dwellings, until the public lands us, without fatigue, upon the roof. There is something entirely new to London experience, and possibly to any other as yet, but

entirely attainable under a systematic reconstruction. In short, the roofage of our chief streets is a public promenade, a continuous park or garden. The original idea in this grateful direction is due, I believe, to Dr. Richardson, who, in removing the too savoury kitchen from the very bottom of the house to the very top, would have the house surmounted by a garden. The chief or only obstacle in the way of such enjoyments is the difficulty of dislodging the ordinary Englishman from his accustomed groove of comparative discomfort. In this time of scientific promise and attainment, we may venture to prohibit smoke entirely to the new city. The sanitary conditions will thus combine with the scenic to give us, with these "hanging gardens" of the modern Babylon, a new era of health and enjoyment for its crowd of citizens.

The project we are now discussing involves the turn over of probably not less than one hundred millions of money. How is all that money to be duly found, and how is the great work, with all this great cost, to be remuneratively executed? This may seem, at first thought, the most difficult section of the whole project. But after much consideration of the subject, based on large business experience, I feel myself on surer ground and more at home in this section of my project, than in the somewhat technical bearings of the other sections, to which I have already alluded.

The great difficulty hitherto in the way of the much-needed clearing and improving of the congested centres of our larger towns has been the terrible amount of the unrecovered balance of the cost. The famous Paris reconstruction has certainly given a most enviable result, so far as regards improvement, but it has been at the cost of a very onerous heritage of City debt. In proposing, as I now do, to execute all the reconstruction of Central London without any such undesirable heritage, and even without appeal to the State for any pecuniary help whatever, I must explain how very differently we are to conduct the proposed work from the methods adopted in Paris and elsewhere, and even in London itself, so far as reconstruction has yet proceeded.

A chief factor in the great reconcept question is what economists have termed the "unearned" increment of site value,—of the value generally of our real estate,—due to the simple effluxion of time in any progressive society occupying a limited site area. The theory which underlies this increment is neither uncertain nor unintelligible, but until quite recently it was left all but entirely to the theories of economists, and anything approaching a practical application of its principle was hardly dreamed of. The past experience of the advance of London site values and rentals, and more especially of those of the central areas of the City, indicates clearly to us now that the cost of a great reconstruction scheme, such as that here proposed, would have been entirely recouped within any thirty years of the past of this century. I mean that if, for instance, in the year 1854, such a great project of reconstruction as I now suggest had been actually undertaken, the present enhanced values of the expropriations, had these been held over until now, would have recouped the whole cost after the fullest compensation at the time to all the expropriated parties. The practical question for us is as to this "unearned" increment of value, or as I would less invidiously call it, this natural increment, continuing to be a feature of the future as of the past. We can hardly doubt that this will be the case, seeing that the causes to which it is assignable are still in as full force as ever; namely, the increase of commerce, wealth, and population, upon a site area which is itself inextinguishable.

We are to bear in mind, however, with regard to this said future increment, that the more it is explained and generally understood, the more will the effect be to convert future value, by intelligent speculative anticipation, into present value. But, on the other hand, there will always still remain a substantial future increment, both because the calculation must ever be wanting in elements of precision, at least, as regards any particular cases of site investment, and because present values and rentals will always depend more upon the present scale and returns of business, than upon any speculative estimate as to what these may possibly attain in the next generation. And, again, behind this prospect of recouping increment, we have in store all the additional value of a resanitized London, a value which, in its

heretofore unknown quantity and power, may possibly prove the most secure and effective factor of all.

ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this Association, held on Friday, the 1st inst. Mr. Cole A. Adams, president, occupied the chair.

The Hon. Sec., Mr. Appleton, announced that the next Saturday afternoon visit of the members of the Association to works in progress would take place to-morrow (the 9th) to some new houses in Harrington-gardens, designed by Messrs. Ernest George & Peto.

The Chairman referred in feeling terms to the death of Mr. John Henry Parker, the eminent archaeologist. He said Mr. Parker had been a friend to all the leaders of the Gothic revival, and his name would live long in the memory of all students.

Mr. J. D. Crace then read a paper on "Colour Decoration," the first part of which we print on another page.

In the discussion which ensued,

The Chairman said Mr. Crace spoke from the valuable stand-point of experience, and was a man who had distinguished himself in the profession which he adorned. He was exceedingly glad to hear Mr. Crace lay so much stress on the decoration of ceilings. He had found amongst those who had not devoted much attention to the study of decoration that the invariable idea amongst people was that to decorate a ceiling was to bring it down on one's head. There was a great deal of truth in the remark that decoration in art must be founded on the uncommon sense of common sense, and they must treat the decoration as they would build a house. A previous paper had raised a discussion on "swags," or curved sprays of foliage on flat surfaces, and he would like to hear Mr. Crace's views on that point. He ventured to differ a little with Mr. Crace on the question of gilding. He believed that gold, as a precious metal, could be employed sparingly and yet produce a brilliancy which was perfectly legitimate. He entirely agreed with Mr. Crace in his remarks upon mosaics. His own feeling had been often one of disappointment at the effect produced by mosaics when used in re-cesses and other places. Mr. Street had said in a paper read before the Institute that mosaics should be used on a large scale, and on curved surfaces at a distance from the eye.

Mr. Stannus complimented Mr. Crace on his able paper. Referring to the matter of the festoons or swags, he ventured to think they were allowable, especially when they were near the margin of the ceiling. Mr. Crace had laid stress on the fact that he wished to give height to the centre by emphasising the margin. The result would be to suggest that the ceiling went slightly up, and then curved round in the form of a barrel vault. In fanciful decoration, such as specimens in the Pompeian and Roman manner, they would be allowed to use the swag festoons. They would not expect him to go into the question of cupola decoration, for obvious reasons; but he was glad to hear Mr. Crace lay down rules on that point with which he entirely agreed. He would query very much whether it was desirable to decorate staircases so much as to call attention to them, especially when he considered the number of accidents that happened in going up and down stairs. Mr. Crace had put the matter well when he spoke of reserving the decoration for the landings. The Association was much indebted to a man like Mr. Crace for coming and giving them the benefit of his experience and observations, and he had therefore much pleasure in proposing a vote of thanks to him.

Mr. A. B. Pite remarked that colour was a study well worthy of the attention of architects, and it was a subject free from the control of District Surveyors and the Board of Works. They were in the realm of artistic elements when dealing with colour, and the right way to study it was not in its relation to bare architecture, but rather to learn from nature. It was not necessary, in doing this, even to travel to Switzerland, for wonderful lessons in colour could be learned even in London, as, for instance, from the late magnificent sunsets. Colouring in nature showed an entire disregard for form.* They would observe this in the case of the parrot, the bird of Paradise, and the quagga, which latter was coloured without regard for

* Mr. Pite had better study nature a little more carefully, and reconsider his statements.—Ed.

regularity of form. Colour was given in nature so that we might enjoy it for itself and not for the forms with which it was associated.

Mr. J. G. Crace, who was called upon to speak, said he had little to say, because his son and he were both of one mind; but the gentleman who had last spoken had raised a spirit within him which compelled him to make a few remarks. He admired what Mr. Pite had said, because it showed an independent mind, for it required considerable spirit to say that they should use colour independently of form. He disagreed with Mr. Pite, because colour could not be well applied if it did not in some degree harmonise with the forms which it sought to delineate and emphasise.

In this country we neglected too much the use of colour. Every ceiling might be vastly improved in grace and wealth of tone and form by the proper application of coloured ornament, suitable to the size of the room. But the one should be applied in harmony with the other, and art, as applied to decoration, would add very much to the appearance, comfort, and brilliancy of the houses of the present day.

Mr. Millard had come all the way from Liverpool to hear Mr. Crace's paper, which he considered excellent and really beyond all criticism.

Mr. H. W. Pratt thought that those who had listened carefully to Mr. Crace would carry away the idea that they could help the decorator very much in his art if they designed their buildings with an eye to their decoration. He had not quite gathered whether Mr. Crace considered it advisable in domestic art that the ceilings should be treated with mouldings, or panelled in some way. He seemed to convey the idea that no ceiling could be satisfactorily treated in a small space if it were flat without any relief at all. As a rule, when the decorator was called in, and there was no shape or form of moulding in the ceiling, he was seldom expected to put anything in that way. Mr. Crace did not say how he would treat the mouldings.

Mr. Appleton thought that it was a mistake to attempt to give a reason for what we liked in colouring, although, at the same time, it was necessary to have certain rules. He believed that in regard to colour, what was one man's meat would be another man's poison.

The Chairman then put the resolution, which was carried by acclamation.

Mr. Crace, in reply, expressed his thanks for the compliment which had been paid him. The first point raised had been as to the use of festoons or swags on ceilings. The point of view from which Mr. Stannus had treated it was correct, if qualified to this extent, that in some cases there was almost an impression of a slightly curved ceiling. All ceilings as they receded from one appeared to have the edge which was furthest away lower than the centre, unless they were badly treated, and for that reason it was necessary to have the direction of any design precisely opposite to what it would be if designed for a carpet. In putting a monogram into the border of a carpet, the bottom of the letters must be towards one; while if the same thing were done in the edge of a ceiling, it could not be done, for the reason that the top edges of the letters must be towards the centre of the ceiling. The edge of the ceiling furthest from one was for all artistic purposes the lower edge, and in that sense the use of festoons had its justification. In regard to the amount of decoration on the staircase, as a rule, the average London staircase was a most disagreeable thing to decorate, and the only thing to be done was not to make it worse than before. If it could be relieved a little, and an appearance of width given without absolutely ornamenting it, this was probably the best that could be done. Mr. Pite had said that in nature all colour was disregarded of form, but he (the speaker) could not read nature in the same way. The forms of nature and of architecture were essentially different, and if they took the case of the quagga they would find the alternation of yellow and black distributed systematically in opposition to the direction of the limbs or the length of the body. Those limbs were not like columns or arches; they did not represent mere stability, but were moving things. And inasmuch as the surface on which the colouring was distributed did not continue in the same shape, the colour was not applied in geometrical forms, which would be unsuitable, but in such a way that the alternation of the surface did not matter. The distribution of colour in the quagga showed, there-

fore, that nature was by no means disregarding of form. In buildings there was an opposite set of conditions, as their elements gave the impression of immovable stability. A small ceiling would be better left without division than a large one. In the latter case it was necessary to supply the place of mouldings by some equivalent lines or divisions.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, the 5th of February, Sir J. W. Bazalgette, C.B., president, in the chair, the paper read was on "Speed on Canals," by Mr. Francis Roubiliac Conder, M.Inst.C.E.

The important question of the resistance to the movement of vessels due to the size and form of channel, or to the depth of open water, through which they passed, was one as yet but little studied. It was only about seven years since the researches of the late Mr. W. Froude threw an entirely new light on the relations existing between speed and the proportions of vessels. A similar study was desirable as to the relations between speed, and area and form of waterway. It was known that a great loss of speed occurred when a steam-vessel passed from open water into a more or less restricted channel. Instances of this had been given in the Proceedings of the Institution. It was also known that a sudden and remarkable increase of speed accompanied the passage of a boat over an increased depth of water, even if it were a mere ballast-hole in the bed of a river or canal. But neither the ratio nor the mechanical cause of this phenomenon had been clearly ascertained by hydraulic writers. In the most important inland navigation of the day, that of the Suez Canal, the low speed attained in the transit was one of the causes of the dissatisfaction felt by the commercial world, and the very small capacity of the canal, for transport was painfully evident. The average speed at which vessels passed through the Suez Canal in 1882 was a little under two miles per hour; and if the speed were taken, not for the whole transit, but for the portion of time during which the vessels were actually in motion, it was only $5\frac{1}{2}$ statute miles per hour, in the year 1882. The greatest speed recorded as having been attained on the canal by any vessel since the opening of the route, was 8.016 statute miles per hour, in the year 1870.

The cross-section of the Suez Canal was about one-half the area on promise of which the concession of the enterprise was sanctioned by the Porte; being 72 ft. wide at a depth of 26 ft., instead of 144 ft. wide at that depth. The sides were constructed with flat shallow shoulders, the rush of water over which at once eroded the slopes, and dragged back the vessel under way. The sides were now being gradually protected by artificial stone. If a cross-section of a semi-elliptical form had been adopted, with adequate side-wallings, in the first instance, for an equal quantity of excavation below the water-line to that of the present canal the hydraulic radius would have been double what it now was; the resistance to propulsion would have been proportionately less; vessels of 4 ft. greater draught of water could have passed, and traffic in both directions at the same time would have been uninterrupted. By giving a larger cross-section of the same scientific form, any conceivable amount of traffic could be carried on. The cost of the canal, as constructed, was returned at 143,585, per mile for execution (to the end of 1882), and 56,466, per mile for management, financing, and interest of money, making 200,051, per mile in all. The cost, at fair contractor's prices, of the walled semi-elliptical canal, 163 ft. wide at the top, and 30 ft. deep, came to 80,682, per mile; and that for the large section, 240 ft. wide, and 30 ft. deep, to 112,280, per mile. The area of the present cross-section of the canal was only three times as large as the immersed cross-section of such a vessel as the *Warrior*. It was impossible for modern vessels like the *City of Rome*, or the *Alaska* (to say nothing of the *Great Eastern*), or for any vessel drawing more than 24 ft. 9 in. of water. A mathematical calculation of the retardation caused by back-current in the canal showed that in the case of such a vessel as the *Warrior*, the retardation from this cause, due to the small size of the Suez Canal, was such as to reduce a speed in the open sea of 14.356 knots, to one of

9.812 knots per hour in the canal. This was independent of the further retardation due to the bad form of cross-section, and also of the direct retardation from shallowness and narrowness, which formed the subject of a separate mathematical investigation.

The various speeds attained on river and canal navigations in different parts of the world had been collected, and were shown in a tabular form. The sizes of locks; the time consumed in passing through locks, hydraulic lifts, and hydraulic inclined planes; and the dates of the River and Canal Acts of Parliament authorising improvements in the inland navigation of the United Kingdom, were also tabulated. The loss of time at present experienced was reduced to a function of the change of level overcome by a canal. The heights to be surmounted by different canal routes crossing England were indicated, and the conclusion was arrived at that by a scientific construction of canals and the application of steam power, a normal speed of five miles per hour, which was equal to the terminus to terminus speed of the mineral trains on certain English railways, might be readily attained on the inland water-ways of the country. For the cost of constructing and of working canals, reference was made to the thirty-seven pages of the Report of the Select Committee of Canals in 1883, contributed by the author of the paper, and to his Reports on the Comparative Cost of Transport by Railway and by Canal, which were reprinted by that committee. The cost, both of construction and of working, on the railways and canals of the United Kingdom, France, Belgium, and the United States; on the railways of New South Wales, India, and Pennsylvania; on the canal and lakes of America by steam colliers and sea-going ships, was given in the Appendix to the Report of the Select Committee; and there was a statistical comparison between the capital cost and net earnings of the French and English railways; and of the mineral-carrying and non-mineral carrying trunk-lines among the latter. The cost of one-third of a penny per ton of cargo per mile was shown to pay working expenses, and five per cent. interest on capital for canal transport, being about one-third of the cost of corresponding transport by railway. The actual limit of the work done on a double line of railway in various countries was shown in a table, and might be compared with the almost unlimited capacity for traffic of a first-class canal.

SOCIETY OF ENGINEERS.

The first ordinary meeting for the present year of the members of the Society of Engineers was held on Monday last, February 4th, at the Town-hall, Westminster.

The statement of accounts for 1883 was read after which the President for the past year, Mr. Jabez Church, M. Inst. C.E., F.G.S., &c., presented the premiums of books awarded for papers read during that year. These were Mr. George Bower, for his paper on "The Bower-Barff Process of Preserving and Ornamenting Iron and Steel Surfaces"; to Mr. Christ Anderson, for his paper on "The Feasibility of Construction of Deep-Sea Lighthouses"; and to Mr. Hamilton W. Pender, for his paper on "Designs, Specifications, and Inspection of Ironwork."

Mr. Church announced that Lady Siemens had kindly presented to the Society several volumes on engineering subjects from the library of her late husband, Sir William Siemens, in remembrance of his long connexion with the Society of Engineers.

Mr. Arthur Rigg, the new president for 1884, then delivered his inaugural address. After referring to the work of the past session, and stating that the short educational courses of lectures commenced during the late president's term of office showed the interest taken by the Society in the education of engineers, the speaker referred to the extended cosmopolitan characteristics of engineering at the present time, and showed how it now embraced subjects so widely separated as the constitution of matter and the dynamics of the heavenly bodies, and the relations of chemistry and other sciences are now intimately related to engineering. Tracing the progress of engineering education in England from the great movement in Lancashire in 1839, which resulted in the establishment at Chester (und-

late Rev. Arthur Rigg) of what developed into the first engineering school in England, the speaker next showed how the superior technical training of Continental schools had influenced the English system, and how now the City guilds were as concerned to make trade secrets generally known as their predecessors were concerned to keep them in the knowledge of few. Regarding the older classical system, it was stated to be produced a higher order of men, endowed with more real wisdom than any mere technical training can supply; and the conclusion was reached that it would be far better to engraft technical education on the well-tryed system of our ancestors, as this would be better suited to English temperament, than slavishly copying a Continental method, too often destructive both of originality and genius.

In illustration of the all-embracing character of modern engineering, the four substances, oxygen, hydrogen, carbon, and iron, were passed in review; and some of their extraordinary physical and chemical characteristics were pointed out. It was also shown how easily the engineer, in carrying out his designs, can bend the "inflexible" laws of nature to his varied requirements, simply by regulating the conditions under which they operate; how the electrical properties of iron, now under investigation, are revealing secrets related to its inner constitution; and perhaps to the anatomy of all matter. It is also bringing under prominent notice that mysterious ether which fills the voids of every substance, and apparently knows no bounds but the confines of infinity. This ethereal thing seems the vehicle through which the powers of nature act, though subject itself to none of their laws; and to appreciate its existence seems as far removed from our powers as to trace the essence of life.

The President remarked on theories, that they are the only guiding lights by which we can penetrate the gloom of all that is unknown, and that their value is only so far as they attain this end. The theorist deserves our gratitude, and may not be blamed if his ideas become shattered as the dust for others of wider scope and more general application. Nor can we wonder at the mistakes of science in its greater generalisations, when it is so profoundly ignorant of things open to its view on every side. If, then, such things as these, it is surely better than a great collection of undigested knowledge, to possess more of wisdom to apply such facts as we really know to practical account.

THE NATIONAL ASSOCIATION OF MASTER BUILDERS.

On Wednesday, the 30th of January, at the Alexandra Hotel, Bradford, there was held the first meeting in that town of the National Association of Master Builders of Great Britain. The meetings of the Association are held half-yearly in different parts of the United Kingdom for the transaction of general business. Delegates were present from London, Manchester, Birmingham, Liverpool, Salford, Lancaster, Leeds, Bolton, Huddersfield, Stalybridge, St. Helen's, Northampton, Hull, Bristol, Blayton, Macclesfield, Lincoln, Warrington, Doncaster, and Bradford. After the report and accounts had been passed, a discussion arose with regard to forms of contract and tenders, and the mode of making out quantities. It was decided to appoint a sub-committee to confer with the committee of the Institute of British Architects upon the point. It was resolved that if a Bill making it compulsory that certificated engineers should be put in charge of boilers on land should be again introduced into Parliament the council of the Association should take steps to oppose it. Mr. Stanley Bird, of London, was elected president of the Association for the forthcoming year, and Mr. Cowlin, of Bristol, and Mr. Neill, of Liverpool, vice-presidents. Mr. J. C. White, of Liverpool, was re-elected treasurer for the year. The council is comprised of the same members as last year, with the addition of another representative each from Bradford and Manchester, the president of each local association being a member of the council, *ex officio*. In the evening the Bradford Master Builders' Association entertained the delegates to dinner at the Alexandra Hotel. More than eighty persons sat down to a substantial repast, Mr. John Beauland, of Bradford, presiding. After dinner the customary loyal toasts were drunk, and the Chairman proposed the toast of

the "National Association of Master Builders." He said that the association began its existence at Birmingham, and had gradually increased in importance. The benefit derived from the Association in the present day was many times greater than that which accrued from it when it first started. He did not wish it to be understood that the associations was got up for the purpose of oppressing the men in any way. Its aims were just the opposite to that; they were to get the men well employed, and give them good work and wages, and preventing them from walking about the streets as they had done in the past. But it was also for the purpose of preventing unreasonable men from driving them into a difficulty, and the Association had been very useful in that respect. He hoped that the representatives of the Association which met in Bradford for the first time under its present name would go away satisfied with the Bradford builders, and that the local associations would be convinced that there were advantages to be derived from joining the general one which could not be gained in any other way.

Mr. Stanley Bird, of London, responded on behalf of the Association, and said that it was principally through the efforts of Mr. Beauland that the National Association had its birth. He also referred to the advantages to be derived from the connexion of a local organisations with the National Association, and pointed out that after its formation, and in his opinion to a great extent as a result of that, there had been no serious and general strikes in the trade. They were now frequently able to talk over grievances with the men, and, by reason of their combination, to settle differences in an amicable way. That was very much better than the protracted strikes which they had had in the past, and which brought nothing but misery and ruin to all concerned. After commenting upon the change in the attitude of the architects towards builders, he concluded by advising them to be always ready by means of thorough organisation, so that if the necessity came they could meet either the men or the architects.

THE HOSPITALS ASSOCIATION.

A MEETING was held on Friday, the 1st inst., at the Mansion-house, for the purpose of establishing a Hospitals Association, to consist of gentlemen connected with the various branches of hospital administration, the objects of which should be to facilitate the consideration and discussion of matters connected with hospital management, and, where advisable, to take measures to further the decisions arrived at, and to afford opportunities for the acquisition of a knowledge of hospital administration, both lay and medical.

The meeting was presided over in the first place by the Lord Mayor, and afterwards by Earl Stanhope.

Major A. H. Ross, M.P., chairman of the provisional committee, in an explanation of the objects of the association, said he hoped that the offices of the association would act as a storehouse where those interested in hospitals might find the plans of the newest and best systems of building, draining, and ventilating those edifices. Inventors of surgical appliances might submit their productions to the association, and thus gain publicity.

Sir T. Fowell Buxton moved the following resolution:—"That in the opinion of this meeting it is desirable to establish, under the name of the Hospitals Association, and on the basis of the constitution prepared and adopted by the provisional committee, an organisation for the consideration and discussion of matters connected with hospital management," which was seconded by Sir R. Alcock, and eventually carried; and the preliminary arrangements were, by another resolution, entrusted to provisional committees.

The Cost of the Rathaus at Vienna.

According to a statement in the *Deutsche Bauzeitung*, the Municipality of Vienna has granted a further sum of 210,000*fl.* for the completion of the above building. It is, however, remarked that this estimate includes internal work of a technical and artistic character, the introduction of electric light, &c., so that the payment of the amount will necessarily extend over a more or less protracted term. The sum brings up the total cost of the structure to 1,250,000*fl.*, as against an original estimate of 825,000*fl.*

THE SURVEYORS' INSTITUTION.

PRELIMINARY EXAMINATION, 1884.

Of fifty-one candidates who presented themselves at the preliminary examination of the Institution, held on the 22nd and 23rd ulto., the following satisfied the examiners:—

Adkin, Benaiah Whitley	Lansdowne, Harold Walker
Burrows, Alfred John, Junr.	Lowe, Charles Robert
Callendar, William Jackson,	Perkins, Walter Frank
Cross, Arnold Charles Martin	Picks, Sydney
Dalton, Seymour Grant	Phillips, William Dearlove
Eve, Herbert Trustram	Physick, Walter Frederick
Eve, William Harold	Puckridge, Percival Martin
Goodwin, Edward	Turner, Percy
Halton, Harry Russell	Vaie, Henry
Hay, Mountford Henry	Vowler, G. Reginald
Homan, Hubert Franklin	Warton, Wilfred
Hussey, John Walton	Watson, John, Junr.
Jonas, Harry Marshall	Whalley, Frederick Herbert
Junkison, Albion	Williams, Sydney
King, William Isaac	Worthington, James Scott

* Passed at head of list.

GLASS FLOORS IN FRANCE.

ATTENTION has recently been drawn to the above subject by a leading organ of the glass trade in Germany. While hitherto glass slabs have only been used to furnish light in certain portions of the flooring to the rooms below, the new building of the *Crédit Lyonnais*, on the Boulevard des Italiens, Paris, is referred to as affording an instance of an entire floor being constructed of glass. There are two basement stories, and the flooring of the higher of these, as well as of the ground-floor itself, is entirely composed of glass slabs placed between iron constructions.

Of late years glass flooring seems to have acquired increased favour in Paris for use in banks, commercial establishments, &c., on account of its durability and relatively moderate cost. The glass slabs are cut out in small squares, &c., to prevent their being slippery. These tiles are cast, and have a greenish reflection.

The article is regularly manufactured in Germany, and in a thickness of four-fifths of an inch costs from 8*s.* to 16*s.* per square metre (10½ square feet).

"WHAT ARE THE NEW WAR-OFFICES TO BE BUILT OF?"

Sir,—Your correspondent "H. M." [p. 146, ante] advocates the use of granite for these buildings, believing that the enormous expense necessarily involved would be cheerfully borne because "for all time it will defy the storms and weather." Allow me to point out that this would depend, as with Portland or other stone, to some extent, upon the quarry from which it came, and upon its careful selection, in proof of which a visit to some of the granite-built churches near Dublin will show that there the material has crumbled away to a terrible extent. Doubtless reluctance would very properly be felt in employing a foreign material if an English one as good and not more costly could be obtained; but I fear this is impossible, for I believe there is no stone in Europe for strength, durability, and economy, to equal what is known as Belgian granite,—in reality a blue marble of great density, capable of sustaining, practically, the same weight as Scotch granite, and, when fine-ared, scarcely distinguishable from it in appearance. This material has been extensively used for many centuries throughout Belgium and in many other parts of the Continent, and work of the thirteenth and fourteenth century still shows the tool marks as sharply as on the day they were made. The quarries are, practically, inexhaustible, and blocks of enormous size are always obtainable. The New Palais de Justice at Brussels, one of the grandest and most stupendous buildings in Europe (whatever we may think of its style and details still a magnificent erection) is composed almost entirely of this material; so also the New Docks at Antwerp. In the new parish church at Hammeremith the same stone has been largely used. With regard to the question of economy, I may state that, before using it, I obtained tenders for the workmanship and material delivered from the principal Aberdeen granite-quarry owners, as well as from Belgium, and the lowest prices were, for Aberdeen granite 4,195*l.*, and for Belgian granite 940*l.*, more than 75 per cent. cheaper; in fact, about the same price as for Portland stone, averaging about 8*s.* 6*d.* per foot cube, and nearly all of it moulded and polished. I have since used it

in two more churches and in other work at similarly low prices, and can heartily commend it to any one wanting a handsome, durable material at moderate cost.

I notice that "H. M." in referring to stone, says, "Allow the sap to go clean out of it before it is used." I am fully aware that almost every architect will say the same, but I have for years maintained that the system is wrong, and that if you want to render any stone perishable, the surest way is to buy it "well seasoned," then work and use it, and decay will follow sooner or later, as a matter of course. That stone ought to be seasoned before it is built in, particularly in winter, is unquestionably true; but the seasoning or drying should be done after it is worked, not before. I would ask "H. M." or others who differ from me, and their name is legion, to try a few simple experiments for themselves. Let them take some well-seasoned stone,—and the more seasoned it is the better, they will doubtless say,—so let them try some thirteenth-century mouldings that have retained their original sharpness; let them re-work these, and in a very few years, or perhaps months, they will assuredly decay.* Again, let them take a block of seasoned stone, such as they would specify (but which, by the way, happily, they do not often get), let them try the outside with a chisel, and see how hard it has become; pour water upon it, and see how non-absorbent it is; then cut it open, and see how much softer the inside is, and how much more readily it absorbs water. The sap, I maintain, is the vital part of the stone, and in process of drying it comes to the surface, and forms a natural preservative. At the Grosvenor Hotel, Piccadilly, the basement is of Portland stone, and this is decayed in many parts, but the upper portion is of Bath stone, and in this I fail to detect any signs of decay. I have heard that the Bath was specially quarried, and worked soon after, but not so the Portland. Perhaps some of your readers can inform me whether this is a fact; if so, it is a strong argument in favour of my theory. I have heard the same remark made of the stone used in building Somerset House, i.e., that it was intentionally worked soon after being quarried. We hear it said of nearly every stone that it stands well in its own neighbourhood, but will not stand the London atmosphere. I believe this simply means that the old master-masons took it from the nearest quarry as they required it, and worked it with the sap in it; whereas most of the stone used in London is supplied by merchants who keep it in stock until the sap has dried out, and the only durable portion left is the outside. The importance of the question must be my apology for trespassing so much upon your valuable space.

HUGH ROUMIEUX GOUCH.
6, Queen Anne's Gate, Jan. 28th 1884.

Sir,—In your issue of the 26th ult., "H. M." tells us that the question is being constantly asked, "With what stone will they be built?" and he then puts the following question on his own behalf: "Can the Government see their way to give us one fine building from the igneous rocks? The expense will be very great, but . . . it will defy the storms and the weather." Perhaps as a very vigorous and enterprising First Commissioner will have the responsibility of settling this matter, "H. M.'s" desire may be realised. The question of expense, i.e., relative extra cost of granite over freestone, depends entirely upon proper architectural treatment, or the reverse; upon attention to one of the first principles of our art, viz., that every material must be used in strict accordance with its natural characteristics; style and details must be so appropriate as at once to indicate the material. Moreover, in considering expense, it should not be forgotten that thousands of pounds sterling are at present paid in restoring the perishable stonework of existing buildings. The exterior of the Treasury, in Whitehall, is now being repaired at a cost of 8,000l. The Houses of Parliament absorb 2,600l. annually,—a capital sum of 70,000l. To preserve the stone, the east front of Buckingham Palace is periodically painted. The restoration of Lambeth Palace was completed a few months ago. St. Paul's had lately part of a column put to one of its porticos. Scarcely any important building is now erected

* This has been illustrated by painful experience, in church and cathedral restoration, many times.—Ed.

without granite being employed more or less in its ornamental details. It is thus evident that it is much in favour with the profession, and it is, therefore, worth considering for a moment, whether in contemporary architecture it is applied in the most discreet manner possible. Is it not a mistake,—a waste of money,—to execute dentilled and burnished cornices in such an intractable material? Are not Renaissance columns and pilasters improper details when their material forbids you to furnish them with their legitimate capitals? Is it not wrong to put up door-jambes, the mouldings of which are so disproportionately bold as to suggest the engineer rather than the architect, and for no other reason than that it is almost impossible to execute properly proportioned delicate mouldings in granite? And is it not a glaring violation of good taste, to say the least of it, to insert brightly-polished columns and pilasters which never change, even in our smoky atmosphere, into facades merely constructed of soft porous stone, which is defiled with soot before the workmen have departed? For my own part, I venture to think that if granite, porphyry, serpentine, and basalt were properly allied with a suitable style, and were not mixed up with an altogether unworthy inharmonious neighbour, not only would the most splendid result ensue, but there need be little, if any, extra cost; and I further venture to predict enduring fame for the architect who shall first present to the public eye a complete edifice constructed with these noble and everlasting materials. There exists sufficient evidence of their use from pre-historic times downwards. Why neglect them to-day? Little more than the determination to use them is necessary. They lie, so to speak, at our very doors. We pave our streets with them. Prime cost in London is little in excess of the best perishable freestones. The requisite machinery is available for surfacing and burnishing them at small cost. The appropriate details may be studied in almost any Italian or Oriental city, and detached specimens may be seen in our museums. Burnishing is necessary to exhibit the innate beauty of these materials, and the hard, smooth, and impenetrable surface thus obtained is just what is wanted for facades in this fuliginous climate. The highest artistic treatment,—a new Renaissance,—would be possible in the hands of competent designers, as the materials yield every tint and colour of the chromatic scale,—pure white from Okehampton, in Devon; silver grey from Gunnislake, in Cornwall; red syenite from Leicester; blue granite from Peterhead and Aberdeen; green serpentine from the Lizard; black basalt from Cleve Hill, Salop; and, according to Dr. Borlase, a yellow granite from Cornwall. As to durability, it is only necessary to say that there are granite structures of various kinds in London from twenty to eighty years old, as perfect as on the day the workmen finished them. If, therefore, we desire our future buildings to be durable rather than perishable, it cannot be said that we have no experience to guide us in securing so desirable a result. T.

ASSYRIAN ARCHES.

Sir,—In your last number [p. 161] there was the copy of a letter from me to Professor Newton, and I see that, in condensing my draft, I have made it appear to intimate that the arched vaults by which Victor Place and others suggest that the Khorsabad chambers were covered were pointed. This would, perhaps, get over the difficulty which Mr. Fergusson pointed out, viz., of spanning a 33 ft. chamber with sun-dried bricks, but M. Place is not responsible for the suggestion. I may mention that, whatever may have been the case at Khorsabad, the researches of Mr. G. Smith show the probable correctness of Mr. Fergusson's theory as to the ceilings having been supported by wooden columns.

I alluded, in the above letter, to the arched vaults still in use in Upper Egypt. I have not seen any drawings of their construction, so I annex a sketch of one which I saw at Edfon. I noticed many such vaults higher up the Nile.

The one sketched was about 16 ft. span, and built of sun-dried bricks in half-brick rings. Some vaults were larger, and formed of whole bricks.

Until they were quite set they must have required some such centring, as seems indicated in the Lycian arched tombs.

T. H. LEWIS.

THE DEFENCE OF BUILDINGS FROM LIGHTNING STROKES.

Sir,—Your well-timed and temperate article upon the above subject [p. 120, ante], coming as it does simultaneously with the report of, and discussion upon, Colonel Parnell's paper, read before the Royal Institute of British Architects, is an earnest of the interest taken by you in the matter; and, as you represent the practical side of the question from the architect's point of view, I should like to be permitted to supplement your remarks by a few observations, specially relating to those "cases reported where buildings have been damaged notwithstanding the presence of lightning-conductors." Careful investigation into instances of damage where conductors have been present have revealed the fact that at the time of the lightning stroke the conductor was not in an efficient condition. Now it is evident that the value of a lightning-conductor is proportionate to its efficiency, and therefore that some method of ascertaining its condition is needed. An electrical test to ascertain its continuity and resistance is the only one that answers the purpose, and it is this part of the work in which I take an especial interest, coming as it does within the special province of the electrical engineer. All authorities upon the subject,—including the Lightning-rod Conference,—urge the necessity of these electrical tests; but one and all fail to give instructions as to the how of doing it. There is, however, no use in shirking the difficulty,—for difficulty it is, with ordinary conductors,—which involves the carrying of a testing-wire from the ground to the point of the conductor, so that the current may be sent through it to be passed down the conductor into the earth. The conductor would need filing, and the bare wire cleaning bright in order to ensure good contact. On the ground, what is called a good "test earth" needs to be provided, which, being obtained, the party testing is in a position to make the test. There are several instruments by which this can be done, but for accurate work the "Wheatstone Bridge" is generally used. The resistance of a good conductor of say, $\frac{1}{2}$ in. diameter, is considerably under one ohm, but oftentimes, through a bad earth connexion, it rises to seventy, eighty, and even hundreds of ohms resistance. From a test made by me of the conductors on York Minster in the autumn of 1881, and of those on Lincoln Cathedral in 1882, I can say that the conductors themselves were fair, but the earth connexions faulty, and this after a season of wet, when they would appear at their best or lowest resistance. This question of testing conductors is one of vital importance, as unless they are kept in a state of efficiency they are worse than useless; but, since it is proved that efficient conductors are valuable protectors of buildings, how essential is it to keep them in proper repair. This was noticed and alluded to by the *Daily News* on the 26th of August, 1880, as follows:—"That they" (lightning conductors) "must be properly constructed in order to be efficient is no reproach against lightning conductors, for it is true of most other safeguards against the calamities which our flesh is heir to. . . . It is equally clear that they ought to be subject to some systematic supervision, so as to ensure that they shall be always in repair. . . . With such precautions there can be no doubt that our dwellings and public buildings might be rendered absolutely safe at no very great addition to the cost of construction, not to speak of the saving of human life, which this important reform would unquestionably effect." In the case of tall chimneys and pointed church spires the cost of sending a steple jack up to the top with a testing-wire, say once a year, would be a heavy tax, and is, doubtless, the reason why so many persons who willingly pay for a conductor allow it to become neglected and valueless. To obviate this, and to save unnecessary danger after the first erection, I devised a special kind of conductor, which could at any time readily and easily be tested. It is in the form of an ordinary conductor, either rope or tape, with the testing-wire run up the centre, and soldered at the top to the conductor. When fixed, the testing-wire is divided at a few feet above the ground and connected to a couple of terminals in a little test-box, wherein is placed another terminal connected to a good earth for testing purposes. With such an arrangement the conductor can be easily tested at any time, without risk or danger, and at the most trifling

cost. For conductors already fixed, or new ones other than my "easily tested" form, I run an open or base wire to the top of the conductor, and connect it at the test-box in a similar manner to the other. The condition of the conductor being known by the tests, a remedy can be applied and the conductor kept efficient. For such work there is great need. A lightning-rod erecting and testing company, possessing public confidence, might do good work by testing and certifying yearly to the condition of conductors.

SAMUEL VYLE, Electrical Engineer.
4, New Broad-street, E.C., Jan. 20, 1884.

INTERNATIONAL HEALTH EXHIBITION (1884).

SIR,—I hasten to address you upon a subject which I venture to think is of the utmost importance to exhibitors in the forthcoming Health Exhibition.

The committee in charge of Group 3,—the Dwelling House,—have resolved to erect in the grounds of the Exhibition a model dwelling, having the most perfect sanitary appliances.

Now, as I understand this proposal, the committee will build a house and place in it the appliances of certain makers. There will probably be Mr. X's flushing-tank, Mr. Y's water-closet, Mr. Z's disconnecting-trap, &c., and these will doubtless be things the committee have the highest opinion of. But would it not be inflicting a great injustice on the masses of exhibitors, and possibly misleading to the public, to place such appliances in this model building previously to the exhibits invited from the whole world being examined and judged? I submit that the placing of any maker's appliance in this house would be equivalent to proclaiming that it was the very best in existence, and would afford such a gratuitous advertisement as would be of much more commercial value than any number of awards or medals given afterwards.

I would further suggest that it would be much more just to erect the model dwelling after the jurors have made their awards, and then to bring into use, as far as possible, the various appliances that have received the highest marks of commendation.

SANITARY ENGINEER.

CARPENTERS' EXHIBITION.

SIR,—In reply to a letter in your last issue signed "Henry Dunkley" [p. 180], permit me to say that the main object the Carpenters and Joiners' Companies had in inaugurating the Exhibition was to develop any latent talent there might be amongst the artisans employed in the respective crafts, and to promote a wholesome spirit of rivalry in producing really good work.

Were we to pretend to pay exhibitors the cost of their exhibits, we should be laying ourselves open to an unknown amount; and Mr. Dunkley must be aware that at no exhibition of any kind are the prizes offered supposed to be of the value of the exhibits.

I know the fact of having gained a prize in the exhibitions held by other City companies has proved of very great advantage as a recommendation to future employment. It is in this way we hope to benefit the recipients of prizes in our Exhibition, of whom, I hope, Mr. Dunkley will be one; and though "honour cannot set a leg," it can materially assist in giving a "leg up" to those who gain it.

STANTON W. PRESTON,
Clerk to the Carpenters' Company.
Carpenters' Hall, February 6th, 1884.

TECHNICAL EDUCATION.

SIR,—Will you allow me to correct a slight error (no doubt a slip of mine) in your admirable report of the discussion upon Mr. Harland's paper [p. 175, ante], read at the Artisans' Technical Association?

I am reported to have said:—"that the Science and Art Department gave two science certificates." It should read to this effect:—"The City and Guilds Institute required two science certificates before granting a full technological certificate to the candidates who have passed their examination, and my idea is that the directors of the Institute should insist upon the possession of an equivalent art certificate in addition to those in the science subjects."

Of course, I am speaking for my own trade only.
W. A. BARBER.

Lincrosta-Walton.—Messrs. Frederick Walton & Co. (Limited) inform us that "Lincrosta-Walton" has been awarded a gold medal and first-class certificate at the Calcutta International Exhibition.

VENTILATION.

SIR,—I shall be glad if you will allow me space to reply to a letter that I see in your last issue [p. 180], with reference to the subject of ventilating rooms, &c. I saw and use a short time since a ventilator that certainly possesses all the qualities necessary for ventilating rooms well. The "Harding" ventilating system is the one I refer to. The great advantage of the system is that fresh air is admitted into the room with absolutely no draught or chilly sensation being felt. The incoming air is thoroughly purified by a patent method from all dust or soot or other impurities, so that the room is kept supplied with fresh clean air. With reference to the outlet for the vitiated air, the fireplace is usually found sufficient as an extractor when there is a good inlet; but in rooms where many people are likely to assemble, one or two of the well-known mica valves are inserted in the flue near the ceiling. I have personally tested the system, and feel confident that your correspondent will be satisfied if he uses it. The inlets are made in several very good designs, so as to suit any room or building.

Messrs. Strode & Co., of London, the well-known gas and ventilating engineers, are the only agents for the system.

I believe the Leeds School Board is employing the system in their schools. ARTHUR KEEN.

ENSILAGE.

SIR,—With reference to this subject now being discussed in your columns, we quote a few words spoken by Lord Walsingham the other day, which show the immense value of ensilage. He says:—

"I look to the use of ensilage, which has now passed beyond the stage of experiment and must be regarded as a successful new departure, to become a valuable factor in all farming calculations of the future. If it can be conclusively proved, as I believe it can, that a field of lucerne, or sainfoin, or grass, will supply to the mouths of our sheep and cattle more than four times the weight of good and nutritious food if made into ensilage than if made into hay, and this without risk of loss in quantity or in quality, what is to prevent us from keeping at least three times the number of live stock that we now keep, and realising more than double the profit we are now able to show upon that branch of our accounts."

As to the construction of silos, we prepared plans for Lord Walsingham's agent, Mr. H. Woods, of Merton (well known as a most scientific agriculturist) as to the conversion of old clay-built barns on the estate into silos. It was determined to convert one bay at first, and across the bay front was put a 14 in. brick wall to within 3 ft. 10 in. of the tie-beam, and two division walls of the same description, which gave three silos, each 14 ft. 4 in. in length, 6 ft. 3 in. in width, and 9 ft. 3 in. in depth; the cubic space being sufficient for at least fourteen or fifteen tons of ensilage; but there is no reason why 2 ft. more brickwork should not be added to the height of the walls, so as to make room for three tons additional, or seventeen or eighteen tons in each silo. The barn floor was laid with asphalt some years ago, and therefore the silos required no new bottom. The walls were covered with cement plaster, composed of Portland cement and well-washed road silt, in the proportion of three of cement to one of silt. This coating, which was about $\frac{1}{2}$ in. in thickness, answered well in every respect, and showed that even clay-built barns are easily convertible into good silos. To prevent the brickwork being displaced in the filling process, a $\frac{3}{4}$ in. plank, 1 ft. 2 in. wide, was properly secured to the wall top; and to facilitate the emptying of the silos, a well-made $1\frac{1}{2}$ in. boarded door, protected by a coating of hot tar and pitch, was inserted in one corner of the front wall of each silo. The frames of the doors were set on the inside so that the doors opened inwards to the partition walls, and the apertures were hermetically sealed by means of 4-in. brickwork on the front sides. The total cost of these three silos did not exceed 30l. When the silos were quite filled with grass (which is much more closely packed if cut into chaff before ensilaging), the contents having been well trodden and rammed down as possible, they were covered with wooden shutters, over which was spread a bed of coarse bran about 8 in. deep. For weights, clean flint stones were used in wicker skeps, costing 1s. each, and lasting many years. The pressure over the whole surface was $1\frac{1}{2}$ ton to each silo of 15 tons. The cost was 12s. 9d. per acre, and had the crop been made into hay, it would have averaged about 11 ton to the acre. The average cost of making 11 ton of grass with hay, stacking, and afterwards cutting into chaff, is from 25s. to 26s. per acre. Thus ensilage is produced at a saving of 50 per cent. on the cost of ordinary hay-making and chaff-cutting.

We also prepared plans, &c., for over-ground silos for the storage of 100 tons in four silos under one roof. The size of these was:—Length, 17 ft. 6 in.; width, 9 ft.; depth 10 ft.; total length of silo, 38 ft. 6 in.; width, 21 ft. 6 in.; walls, internal and external, 1 ft. 2 in., and 4 in. concrete floors, and coated (as well as walls) with $\frac{3}{4}$ in. cement of equal Portland cement and well-washed road silt. The walls were tied together with 1-in. iron rods. A door was provided for each silo, and one in each

gable for the filling of the grass into the silo. The total cost for the whole building was 175l. In the event of a landlord assisting the tenant in the erection of such a building at the rate of 5 per cent. on the outlay, the tenant would obtain a silo at the moderate yearly charge of 1s. 9d. per ton on his ensilage.

OLDHAM-CHAMBERS & WILKINS, F.R.I.B.A.

PROVINCIAL NEWS.

Stratford-on-Avon.—On the 30th ult. Mr. Arnold Taylor, an Inspector of the Local Government Board, held an inquiry at the Town Hall, Stratford-on-Avon, with reference to an application by the Corporation to borrow the sum of 23,500l. for works connected with a water supply, and also the disposal of the town sewage. The Corporation proposed to borrow, in addition, 600l. to complete the purchase of certain property known as the Bancroft, which it is intended to lay out as public gardens and recreation grounds for the free use of the inhabitants for ever. Amongst those present were the Mayor of Stratford (Mr. Hodgson, C.M.G.), the ex-mayor, the town clerk (Mr. T. Hunt), Mr. Pritchard, C.E., of Birmingham; the medical officer of health, borough surveyor, and most of the members of the town council. The town clerk said all the notices had been served, and notices had also been forwarded to the Local Government Board. He was pleased to say that there was no opposition to either of the schemes. Mr. Pritchard, C.E., at the request of the inspector, gave an outline of the two schemes, remarking that a provisional order had been obtained to do the work. With regard to the water scheme, he proposed to go to Snitterfield, four miles distant, and abstract from a brook in a field belonging to Mr. R. N. Phillips, M.P. He proposed, in addition, to construct a conduit 3,250 ft. in length, whence a supplementary supply would be obtained. A reservoir to hold 15,500,000 gallons would be provided in case the supply should fall short. He explained the scheme for the disposal of the sewage, which, at the present time, is put into the river. He proposed a system of broad irrigation and downward filtration. Part of the land to be utilised belonged to the Corporation, and other portions had been purchased of the late Marquess of Hertford. The sewage would be distributed over the ground by centrifugal pumps, worked either by steam or powerful gas engines. He estimated the cost required to complete the works at 23,500l. The inspector intimated that he regarded the schemes favourably, stating they had evidently been well and carefully considered, and he would report in due course to the Local Government Board.

Barrow-on-Soar.—The erection of new Portland cement works has just been brought to a conclusion by Messrs. John Ellis & Sons, at their lime works, Barrow-on-Soar. The buildings are of Thurmaston red bricks, laid in special mill-prepared mortar, supplied to the contractor by Messrs. Ellis. They consist of engine and boiler-houses; six-stone mill of three floors; building containing crushing machinery; cement store, with railway siding communicating with the Midland Railway main line; kilns, chimney shaft, drying store, and cask sheds; offices, laboratory, and testing-house. The roofs throughout are covered with Swithland slates, from Messrs. Ellis & Sons' own quarries. The builders were Messrs. Clark & Garrett; the slating is by Messrs. Ellis, Partridge, & Co.; the woodwork by Mr. Alfred Plant; and the constructional ironwork by Messrs. Gimson & Co., all of Leicester. The earth and concrete work and erection of kilns has been done by Messrs. Ellis & Sons' own workmen. The machinery throughout is the work of Mr. Frank Ashwell, of Leicester. The works have been designed by Mr. Charles Spackman, and carried out under his supervision.

Abergavenny.—Plans prepared by Mr. E. A. Johnson, architect, of Abergavenny, have been adopted for the laying out of a new park for that town. Tenders will shortly be invited for carrying out the work, which includes a large area of planting and earthwork, a cricket pavilion, grand stand, entrance lodge, boundary fences, railings, gates, and carriage drives.

Birmingham.—An extensive range of buildings has just been completed in Albion-street, Newhall-hill, for Messrs. Bishton & Fletcher, diamond workers, goldsmiths, and manufacturing jewellers. The facade is Italian, and is executed in red bricks, with Greensill stone

strings, sills, and main cornice. The internal arrangements of the various floors have been carefully planned to meet the peculiar requirements of the various branches of the firm's business. The heating of the premises is effected by the hot water system of Mr. R. Renton Gibbs, of Liverpool. The whole of the works have been carried out by Mr. Thomas Hughes, builder, of Hockley, under the supervision of the architect, Mr. W. Tadman Foulkes, of 100, Colmore-row, Birmingham.

Books.

Farm Buildings. By JOHN SCOTT. Published by Crosby Lockwood & Co., London.

ONLY those who, like the present writer, spent their early years in an English farm-house,—alas! too many years ago,—can fully appreciate the progress which has been made in some directions in the architecture of the farm. The deep miry ways, the stagnant, noisome pools, the general presence of "matter in the wrong place," the casual scattering of the farm-buildings, the happy-go-lucky ways of the jolly farmer and the haphazard character of all his surroundings have all disappeared, or nearly so, in presence of the ever-increasing difficulty of making both ends meet. And with them we have lost all the picturesque elements in English landscape. We have exchanged the lichen-covered walls in ample and effective masses of ashen-grey stone, or ruddy brick, and have got in their place the muddy-brown stock brick, or the still more colourless and uninteresting concrete; while for the snug thatch and the warm many-tinted tiles we are put off with corrugated iron, or the "Willensden roofing-paper"! Art has given way to science, and the modern homestead is a model of cheap fragile construction, and of a precise and mechanical disposition of parts arranged in nicely-calculated sequence with a severe regard to the attainment of the largest practicable return for the smallest possible investment.

There are, of course, certain clear gains which must be credited to the new system. Healthier sites are chosen, where the air is pure and fresh, and can circulate freely, where water is good and abundant, and where the subsoil is favourable to effective drainage. These matters were neglected by our forefathers, and it was by so much the worse for them, and for us. Nowadays the very pigs have more consideration than of old felt to the lot of their masters.

"My piggeries are upon a well-drained site," writes an artist in this branch of farming. "with a southern aspect; they have plenty of fresh air and light; ample provision exists for warmth in winter and shelter in summer; their floor is of hard gault bricks laid in cement, and at the rear of the piggeries a field has been fenced off as an exercising ground so necessary for developing the legs of the young boars."

Would that our young Christians had the same opportunities. "Please the pigs" was a favourite expression of our grandfathers; but the pigs never had those pleasures which attend their more fortunate posterity, thanks to Mr. Scott and his followers. The late Mr. Wright (comedian) was treated with marked indulgence by the "Pawnee Indians," but his diet failed to nourish him when he became aware of the real object of his captors' solicitude. It is as well that as the lamb "licks the hand just raised to shed its blood," so the young boars should develop their legs in peace, and without so much as suspecting that there is such a commodity as ham in the world.

As might have been expected, the Americans are foremost in the cool effectiveness with which they manipulate this harmless necessary animal, from his cradle to his grave; and if there ever was any poetry in the pig, it has evaporated in the American example of his home and accessories given at p. 103 of this "thorough" treatment of his home.

The arrangement of farm buildings is really a matter for the ingenuity of a scientific farmer, but their economical construction affords scope for a good deal of professional ingenuity, and there are ample opportunities for the practical architect in elaborating the details which facilitate the numerous processes carried on in the modern farm-yard.

The author gives numerous plans of executed homesteads, but wisely cautions his readers

against attempting to reproduce any of them without the advice of an architect. Experience has proved that there is no more frequent source of danger than this, buildings designed to suit one set of conditions being sure to disappoint those who unthinkingly repeat them in other and widely different circumstances. As a precaution against this class of failure the specifications and estimates might as well have been omitted. The particulars are of little or no use to a professional man, and to any other the limited nature of their applicability would be misleading. We do not think that the cottage plans given are the best which could have been selected, and in the very small and cheap single room corrugated-iron cottage a useless and (comparatively) costly "bay-window" might surely have been dispensed with.

We entirely agree with the author that in a farm-house "the hall should form a comfortable apartment and not be a mere passage with side doors opening into the sitting-rooms," and we are sorry to see that in his plans,—and notably in that on p. 78,—this wise maxim is not followed.

But, after all, these are remarks which a critic is driven to, who must perforce admit, notwithstanding minor faults, the general excellence of the work put into his hands. It stands all the tests we have been able to apply to it,—and there is something about the treatment of the whole subject which carries with it the conviction that it is the work of a practical man. No one who is called upon to design farm-buildings can afford to be without this handy little work, which contains almost all that such a one should know, and which is, moreover, brought down to the latest date.

We ought not to conclude without a reference to the clear, concise, and unaffected style of the author, whose previous works on drainage, water supply, &c., we have had occasion to notice approvingly.

MEETINGS.

SATURDAY, FEB. 9.

Architectural Association.—Visit to Houses in Harrington-gardens. (Messrs. Ernest George & Peto, architects.) 3 p.m.

Proceeding Institution of Builders' Foremen and Clerks of Works.—Dinner at St. James's Hall, Piccadilly. 6.30 p.m.

MONDAY, FEB. 11.

Surveyors' Institution.—Discussion on Mr. T. M. Rickman's paper on "Building Risks and their Incidences." 8 p.m.

Society of Arts.—Mr. Thomas Bolas, F.C.S., on "Recent Improvements in Photo-Mechanical Printing Methods: Intaglio Plates, Colotypes, &c." (Cantor Lecture.) 8 p.m.

London Institution.—Prof. Ruskin will repeat his lecture on "The Storm Cloud of the Nineteenth Century." 5 p.m.

TUESDAY, FEB. 12.

Parles Museum of Hygiene (74, Margaret-street, W.).—Mr. J. P. Soddon, F.R.I.B.A., on "The Ventilation of Theatres." (Mr. George Godwin, F.R.S., in the chair.) 8 p.m.

Institution of Civil Engineers.—Continued discussion on Mr. P. R. Conder's paper on "Speed on Canals." 8 p.m.

Society of Arts (Foreign and Colonial Section).—Mr. H. H. Johnston on "The Portuguese Colonies of West Africa." (Sir F. J. Goldsmid in the chair.) 8 p.m.

Royal Institution.—Dr. Archibald Geikie, F.R.S., on "The Origin of the Scenery of the British Isles." 8 p.m.

WEDNESDAY, FEB. 13.

Society of Arts.—The Rev. J. A. Rivington on "A New Process of Permanent Mural Painting, invented by Adolph Keim, of Munich." (Mr. Hubert Herkomer, A.R.A., in the chair.) 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. A. A. Myall on "Machine Tools." 7 p.m.

THURSDAY, FEB. 14.

Society of Antiquaries.—Mr. J. H. Middleton, F.S.A., "On the Recent Discoveries in the Temple of Vesta in the Forum of Rome." 8.30 p.m.

Society of Engineers.—Mr. J. W. Wilson on "Materials used by Engineers in Construction." 7.30 p.m.

Society for the Encouragement of the Fine Arts.—Mr. Lennox Browne, F.R.C.S., on "Science and Singing." 8 p.m.

Society of Telegraph Engineers and Electricians.—Messrs. R. E. Crompton and G. Kapp "On some New Instruments for Indicating Current and Electro-Motive Force." 8 p.m.

London Institution.—Mr. F. Gale on "Modern English Sports,—their Use and Abuse." 7 p.m.

FRIDAY, FEB. 15.

Architectural Association.—Mr. Lewis H. Isaacs on "The Local Government of the Metropolis: its

Relation to and Effect on London Street Architecture." 7.30 p.m.

University College.—Prof. C. T. Newton on "The Tomb at Djiblahi." 4 p.m.

Society of Arts (Indian Section).—Mr. J. M. Maclean on "State Monopoly of Railways in India." (Sir James Caird in the chair.) 8 p.m.

Royal Institution.—Prof. T. E. Thorpe on "The Chemical Work of Wöhler." 9 p.m.

Institution of Civil Engineers (Students' Meeting). Messrs. Cowan and Fawcett on "A Light-draught Launch." 7 p.m.

Miscellaneous.

Serious Frauds upon a Vestry.—At the Central Criminal Court, on Saturday last, before the Recorder, William Berry Clarke, Charles Kennedy Jordan, and John Williamson, junior, were convicted upon an indictment charging them with a conspiracy by false pretences to obtain from the Vestry of the parish of St. Mary, Islington, certain large sums of money, and with conspiring to defraud the Vestry by rendering to the members false accounts of the amount of material supplied to the Vestry by Williamson, and by false and forged entries in the books and altered documents and receipts. The prisoner Jordan pleaded guilty to the conspiracy counts, but the other defendants not guilty. Clarke was the surveyor of the Highways Department of the Islington Vestry, Jordan was the principal clerk in the same department, and Williamson was a contractor employed by the Vestry for the supply of flints and materials for repairing roads. Jordan gave evidence in support of the case. The jury, without leaving the box, returned a verdict of guilty against Clarke and Williamson. A strong appeal for mercy was made on behalf of Clarke, whose wife is stated to have lost her reason in consequence of the proceedings. The Recorder sentenced Clarke and Williamson to eighteen months' and Jordan to six months' imprisonment, with hard labour.

Sanitary Inspectors and the Homes of the Poor.—On Saturday last a general meeting of the Association of Public Sanitary Inspectors was held at 1, Adam-street, Adelphi, under the presidency of Mr. E. Chadwick. The chairman, in opening the proceedings, expressed the hope that recent agitation on sanitary matters would lead to a great improvement in the position of inspectors, and that in future, instead of working down to ignorance and against sinister influences, they would be able to work up to knowledge. It was, he observed, gratifying to think that, mainly through the efforts of sanitary inspectors, three-quarters of a million of lives had been saved during the last decade. The secretary, Mr. Legg, stated that since the last meeting ninety inspectors throughout the country had joined the association. A discussion was then opened by Mr. Jerram (Walthamstow) in reference to the housing and sanitary inspection of the dwellings of the poor; and Mr. Poulson (Tottenham) subsequently read a paper on "Procedure in dealing with Nuisances."

The Institution of Civil Engineers.—We are asked to state that the series of meetings for the reading and discussion of papers by students of this society will be continued on Friday evenings, the 8th, 15th, and 22nd inst., at seven o'clock. The chair will be occupied successively by Messrs. J. Wolfe Barry, B. Baker, and T. R. Crampton. The subjects to be dealt with are:—1st, "Constructional Ironwork for Buildings," by Mr. Richard Moreland; 2nd, "Light-draught Launch," by Messrs. Cowan & Fawcett; and 3rd, "The Qualities of Metal for various purposes," by Mr. D. G. P. Davies. Those students who have promised or are engaged on papers for reading at meetings of members of their body have been requested to complete and forward them to the Institution as soon as possible, so that no break may occur in the continuity of these meetings.

Railway Information.—The first half-yearly issue of the "Railway Companies' Directory," edited by Mr. Percy Lindley, giving the capital, authorised, received, and expended the revenue, dividends, and mileage, with classified lists of the directors and officers of the railways of the United Kingdom, will be published next week.

Edinburgh Architectural Association.—The usual fortnightly meeting of this Association was held last Wednesday, at 20, George-street, Edinburgh, Mr. John McLachlan, past-president in the chair, when Mr. Thos. Huxley read a paper on "Practical Plumbing."

Early Rising.—The proper time to rise is when sleep, properly so-called, ends. *Dosing* is not admissible from any reasonable or health point of view. The brain falls into the state we call sleep, and the other organs of the body follow it. True sleep is the aggregate of sleeps. In other words, sleep, which must be a natural function, i.e., physiological instead of pathological, or induced by disease or drugs, is a state which consists in the sleeping or rest of all the several parts of the organism. Sometimes one and at other times another part of the body as a whole may be the least fatigued, and so the first to awake, or the most exhausted, and therefore the most difficult to arouse. The secret of good sleep is,—the physiological conditions of rest being established,—to so work and weary the several parts of the organism as to give them a proportionally equal need of rest at the same moment. The cerebrum or mind-organ, the sense organs, the muscular system, and the viscera should be all ready to sleep together, and, so far as may be possible, they should be equally tired. To wake early and feel ready to rise, this fair and equal start of the sleepers should be secured; and the wise self-manager should not allow a drowsy feeling of the consciousness or weary senses, or an exhausted muscular system, to beguile him into the folly of going to sleep again when once his consciousness has been aroused. After a very few days of self-discipline the man who resolves not to "doze,"—that is, to allow some still sleepy part of his body to keep him in bed after his brain has once awakened,—will find himself, without knowing how, an "early riser."—*The Lancet.*

Meteorology.—The last of a course of eight lectures on "Meteorology," by Mr. W. Marriott, F.R.M.S., was delivered on Thursday evening, January 31, in the reading-room of the Society of Engineers, 6, Westminster Chamber, Victoria-street, Westminster. Mr. Baldwin Latham, past-president, in the chair. The subjects treated in this lecture were climate and weather. Climate is regarded as being made up mostly of temperature, rainfall, and the prevalence of certain winds. It was pointed out that there are various kinds of climate, the two most marked being continental and insular. The British Islands enjoy an insular climate, which is shown of all severity by the general influence of the Gulf Stream. Climate also depends upon elevation, aspect, and soil. The various so-called health resorts were referred to as generally possessing some peculiarity in situation, thus rendering the air either bracing or relaxing, and so making it suitable for the treatment of various diseases. After pointing out the influence of weather on certain diseases, the lecturer showed that, although British weather is very changeable, it nevertheless obeys certain laws. All our weather is related to the distribution of atmospheric pressure, and it is by the collection of observations made at the same instant at various places and telegraphed to the Meteorological Office, where charts are prepared and carefully studied, that the forecasts are made, and storm warnings issued. The lecturer concluded by giving a number of weather prognostics and sayings, explaining them by means of isobaric charts.

From the "Asclepiad," a new quarterly magazine of original research and observation in the science, art, and literature of Medicine preventive and curative (published by Cade & Caulfield), we extract the following suggested test for the presence of lead in water:—"A solution of cochineal produced by digesting one part of cochineal in a hundred parts of proof spirit is first made. An ounce of distilled water is next placed in a white porcelain dish, and ten drops of the cochineal solution are added and mixed so as to give to the water a distinct rose-red colour. An ounce of the suspected water is then treated in another white porcelain dish in precisely the same manner, when, if lead be present, a purple-blue tint is struck, varying, according to the dilution, from a purple-blue to a light pink-purple. One part of lead in seventy thousand parts of water, or one grain in a gallon, gives a most distinct purple-blue colour under the test. With careful manipulation, one part of lead in seven hundred parts of water, or one grain in ten gallons, gives a characteristic purple-pink." The magazine is edited by Dr. B. W. Richardson.

Hampreston.—Four two-light Munich windows have just been erected in the chancel of Hampreston Church, Hants, representing various subjects from the life of Christ. They are from the studios of Messrs. Mayer & Co.

Electric Lighting.—The lighting of the new Princes Theatre (of the exterior of which we gave a view a little while since) forms one of the most important experiments in electric lighting which has been recently ventured upon. The lighting has been arranged and carried out by Messrs. Strode & Co., the well-known gas and electrical engineers. The auditorium is lighted by four electriciers from the ceiling, each having nineteen Swan incandescent lamps of 20-candle-power, and, round the fronts of the first and second circles, there are forty-eight brackets, designed by the architect, each having three Swan incandescent lamps of the same power, whilst the entrance vestibule, grand staircase, foyers, corridors, and passages are brilliantly lighted by the same kind of lamps on pendants, brackets, figures, &c., made by Messrs. Strode & Co. to Mr. Phipps's design. The footlights, technically known as the "Float," also consist of fifty Swan incandescent lamps, so that the screen of heated air and products usually caused by gas footlights between the audience and the performers does not exist. There are 300 incandescent lamps altogether, which are supplied with current by one of Siemens's shunt dynamo-machines working into a large number of Faure-Sellon accumulators, so that it is not necessary that the engine (a 12-h.p. Sterne's gas-engine) should be constantly working. The working stage-lights are gas, and Messrs. Strode & Co. have also fixed one of their large sun-burners in the centre of the auditorium, and one of their improved flash instantaneous lighting gas-floors, which principle is also applied to the battens and other stage lights, and many of the brackets in corridors and staircase are made to carry gas-lights as well as electric lamps, so that, although the front of the house is usually lighted by electricity, it can, if necessary, be entirely lighted by gas.

Adjustable Electric Thermometer.—We have had brought under our notice a description of an improved electric thermometer, for the purpose of giving alarm in case of fire, and affording protection from damage by frost in conservatories, &c. As ordinary fire-alarm, electric thermometers have been in use for many years, but hitherto great difficulty has been found in constructing a reliable instrument capable of ready adjustment by the inexperienced hand, and of withstanding exposure to all weather and climates. Messrs. Francis & Co., the telegraph engineers, claim to have overcome this difficulty, as their improved thermometer can be set to any degree, and gives notice, by bell, at however great the distance, of the rise or fall of temperature. By one scale it is permanently set to give instant alarm when the temperature falls to, say, 34°, and by another scale ready adjustment can be made to give notice of a rise to any point desired. In the process of incubation throughout the ostrich-farming districts of South Africa, the wine-growing provinces of Spain and Portugal, as also in numerous vineyards in different parts of the world, the electric thermometer has been found most valuable, and the additional advantage of ready adjustment to any degree will probably be appreciated as giving a completeness to a system which has already proved of such great service in the protection of property under varied circumstances. The invention may be adapted for use on shipboard as a means of protection against the spontaneous combustion of cargoes, and of giving instant alarm on the outbreak of fire in any part of the ship.

The Sixth Annual Dinner to the employees of Mr. James Hill, City Lock Depot, 100A, Queen Victoria-street (late of Upper Thames-street), took place at the Holborn Restaurant on Friday evening, the 1st inst., and was of special interest, as celebrating the inauguration of the new premises. The chair was occupied by Mr. Hill, and the vice-chair by Mr. Ritchie, of Messrs. Steven, Bros., & Co., Upper Thames-street. A number of friends were present, the usual toasts were honoured, and a very pleasant evening was spent.

Wood-working Machinery at the Calcutta Exhibition.—We are informed that the exhibits of Messrs. Thomas Robinson & Son (Limited), of Rockdale, at the Calcutta Exhibition, consisting of wood-working machinery, steam-engine and boiler, have been awarded the Gold Medal.

New Buildings, Fenchurch-avenue.—The marble mosaic paving laid at No. 4, Fenchurch-avenue, E.C., for Messrs. Colls & Sons, as mentioned in our last (p. 176) was executed by Mr. J. F. Ebner, of Clerkenwell-road.

Proceedings against Builders.—On Saturday, at Brentford Petty Sessions, Mr. E. Van Camp, builder, of Kilburn-rise, was charged with the infraction of various building by-laws of the Ealing Local Board. It appeared from a statement of Mr. Charles Jones, surveyor to the Local Board, that the by-laws were made with the express object of putting down the bad building which prevailed. Defendant was charged in the first place with not having 6 in. of concrete covering the foundation before erecting the wall; but this case had to be adjourned because the defendant refused to take up the flooring to allow the surveyor to test it. Defendant contended that the work had been done, and the surveyor might have seen it if he had been there at the proper time. The defendant said his was a well-known firm, and he was not a jerry builder. Defendant was then charged on a second summons with not carrying the abutments to a sufficient depth. He said the defect had since been remedied. Fined 40s. A third summons charged defendant with not constructing "water or earth closets" with windows giving an opening of 1 ft. to 2 ft., exclusively of frame, to let in the external air. Fined 40s. Fourthly, defendant was charged with not allowing a space of 3 in. between the concrete and the floor, for circulation of the air. Fined 40s. Mr. Millwood was charged with not having a space of 15 ft. at the rear of some buildings erected by him in Ealing. Fined 20s.

Artistic Metal Work.—In consequence of numerous applications from the provinces and from many workmen desirous of seeing the Loan Collection of Ancient Iron and Steel Work, organised by Mr. A. Newman at the Galleries of the Mediaeval Arts, 176, New Bond-street, the exhibition will continue till the 28th of February. Artisans at three p.m. on Saturdays.

TENDERS.

For new blocks and alterations at the Swansea Work-house. Messrs. W. D. Blesley & Aspinall, architects, Swansea:—

	New Blocks.	Alterations.
H. Billings, Swansea	£29,125 5 0	£13,077 2 0
T. White, Swansea	29,530 0 0	5,800 0 0
E. Morgan, Tredegar	25,331 0 0	9,989 0 0
D. Morgan, Swansea	24,999 0 0	9,211 0 0
J. D. J. Davies, Cardiff	24,800 0 0	9,300 0 0
J. T. Riley, Eleetwood	22,651 4 0	10,354 0 8
J. B. Lewis, Swansea	22,530 12 8	7,662 4 7
T. Watkins & Jenkins, Swansea (accepted)	21,100 0 0	7,900 0 0

For the erection of ten houses at Clacton-on-Sea, for Mr. Charles Garrood. Mr. T. W. Garrood, architect, Forest Hill:—

Gas	£3,800 0 0
Archer	3,640 0 0
Wood	3,362 0 0
Cos	2,250 0 0
Johnson	2,976 0 0
Hall	2,950 0 0

For road making, sewers, manholes, ventilators, &c., on an estate at Hampstead, for the directors of the National Liberal Land Company. Mr. George Pooley, surveyor. Quantities by Mr. P. E. Murphy:—

W. Carter, Anley	£1,469 0 0
S. Chafen, Rotherhithe	1,438 0 0
G. Felton, West Hampstead	1,247 0 0
J. E. Bloomfield, Tottenham	1,200 0 0
W. Nicholls, Wood Green	1,185 0 0

For alterations to Nos. 3 and 4, Mulgrave-road, Sutton' Surrey, for the executors of Mr. J. R. Hall. Mr. Herbert D. Appleton, architect, 157, Wool Exchange:—

Roberts	£470 0 0
Humphris	450 0 0
Evans	398 0 0
Potter	380 0 0
Parker	375 0 0
Robinson	335 0 0
Wootton	298 0 0

For the erection of an additional infant school to the Board Schools, Oystermouth, near Swansea. Mr. J. Buckley, architect:—

D. Richards & Son	£710 9 0
T. Watkins & Jenkins	570 0 0
Lloyd Brothers	525 0 0
B. Lewis	506 0 0
D. Thomas	495 0 0

[Architect's estimate, about 600*l.*]

For the erection of Eastbourne Town-hall. Mr. W. T. Foulkes, architect, Birmingham:—

Harris, Norwich	£38,000 0 0
Morris, East Grinstead	35,500 0 0
Perry & Co., Borough	35,287 0 0
Peters, Horsham	35,591 0 0
Avard, Maidstone	34,600 0 0
Longley, Crawley	34,500 0 0
Weldon, Aldershot	34,500 0 0
Bisset	34,000 0 0
Wren, Eastbourne	33,515 0 0
Everatt, Colchester	32,450 0 0
Broadwood, Wolverhampton	31,890 0 0
Fall	31,694 0 0
Pearless, Eastbourne	30,125 0 0
Hudson, Kewley & Co., Brighton	30,000 0 0
Foster & Co., Rugby	29,599 0 0
Greenwood	29,915 0 0
Bull, Southampton	29,800 0 0
Dore & Son, Eastbourne	28,745 0 0

For finishing and completing 6 houses in Highlever-road, North Kensington. Mr. Edward Monson, Jun., architect, Grosvenor House, The Vale, A'ton:—
J. Rutter, Latimer-road (accepted) £1,200 0 0

For storm-relief sewers, Eastbourne. Mr. Charles Tomes, Borough Surveyor:—

Bridges & Giles	£24,000 0 0
Bottoms Bros.	29,000 0 0
Hill Bros.	10,337 0 0
J. B. Marshall	18,705 0 0
Cowdery & Son	18,550 0 0
McKenzie & Williams	16,388 0 0
J. W. Neave	15,500 0 0
Headle Bros.	14,501 0 0
W. J. Botterill	13,898 0 0
Ford & Brettell	13,890 0 0
Woodham & Son	13,100 0 0
J. Hurst	12,400 0 0
J. Haywood	11,955 0 0

For the erection of a working men's institute at Castle Road, Cambridge. Mr. Henry George Bishop, architect, Cambridge:—

Bye	£688 0 0
Yarrow	650 0 0
Charter L. Williams	620 0 0
Newman (accepted)	490 0 0

[All of Cambridge.]

For erecting villa-residence in Lucan-road, Tooting, for Mr. J. C. Brooks, omitting painter, glazier, and paper-hanger. Mr. S. B. Grosvenor, architect, 33, Southampton-buildings, Holborn. Quantities supplied by Mr. Henry Burton:—

Oldis Bros.	£322 0 0
Ashley	770 0 0
Johnson	760 0 0
Burman & Son	697 0 0
W. Smith	697 0 0
W. Gr. om.	697 0 0

For building new school buildings at the Dudley Union Workhouse, Dudley. Mr. J. B. Marsh, architect, Dudley. Quantities by the architect:—

Bennett, Birmingham	£7,917 0 0
Robinson, Birmingham	7,693 0 0
Holland & Son, Dudley	7,620 0 0
Coskin & Son, Old Hill	7,568 12 0
Webb & Round, Dudley	7,497 0 0
Rowbotham, Birmingham	7,230 0 0
Pearcock, Gornal	7,190 0 0
Harvey, Northampton, Dudley	7,020 0 0
Garlick, Birmingham	6,999 0 0
Nelson, Dudley	6,949 0 0
Jones & Son, Sedgley	6,890 0 0
Willetts, Old Hill	6,589 11 0
Horton, Brierley Hill	6,748 0 0
Guest, Bretford-lane (accepted)	6,629 15 0

For the erection of cast-iron cisterns and supports, and for various alterations of the water pipes, and adapting them to the new artesian well, at City-road Workhouse, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Son, architects:—

M. T. Shaw & Co.	£647 15 0
T. Potter & Sons	516 0 0
W. J. Fraser & Co.	612 0 0
J. Richmond & Co.	530 0 0
East Surrey Ironworks	458 15 0
C. Kinnell & Co.	417 10 0
May Bros. (accepted)	490 0 0

For erection of studio and stables at Glaston, near Rhayader, for Mr. H. W. B. Davis. Mr. S. W. Williams, architect, Rhayader. Quantities by architect:—

T. P. Evans, Rhayader	£1,690 0 0
G. Dore, Rhayader	1,960 0 0
J. Davis, Hereford	1,180 0 0
H. Welsh, Hereford	1,150 0 0
E. Davies, Newtown	1,122 0 0
J. Williams, Knighton	1,061 0 0
W. Bowers & Co., Hereford	985 0 0

* Accepted.

For the erection of shop premises and dwelling-house for Mr. John Mackie, in Church-street, Camberwell. Mr. R. P. Whellock, architect, Church street, Camberwell, and Pimbury-circus. Quantities not supplied:—

W. Smith (3,878, corrected to)	£5,979 0 0
R. Conder	5,741 0 0
H. L. Holloway	5,487 0 0
F. Higgs	5,440 0 0
J. Tverman	5,371 0 0
W. Downes	5,388 0 0
J. Marsland	5,295 0 0
D. D. & A. Brown	4,090 0 0
A. Mackie (accepted)	2,941 0 0

For roads and sewers on the Glebe Land Estate, Woodford Green, for Mr. Bradshaw Brown. Mr. J. D. Hooper, surveyor, Woodford:—

J. L. Cattell	£1,331 0 0
H. Phillips	1,280 0 0
G. Impey	1,183 0 0
F. Knight	1,169 0 0
J. Jackson	1,159 0 0
C. G. Pound	1,130 0 0
T. Knight	1,088 0 0
Rowland Bros.	1,065 0 0
R. Strachan	1,025 0 0
Th Wilson, Walbamrow (accepted)	998 0 0
W. Nicholls	985 0 0
Woodham & Fry	979 0 0
Jesse Jackson	868 0 0
J. Barwell	944 0 0
T. Adams	898 0 0

For decorator's and painter's work in Wesleyan Chapel and schools, Stainland, near Halifax. Mr. T. L. Patchett, architect, Halifax:—

B. Townsend, Stainland (accepted)	£219 0 0
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[Twenty-two contractors completed.]

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

T. H. S. Sydney.—F. J. S. (not required)—R. J. H. A. H. M. E.—Rev. E. V.—"New Ideas" (we have plenty of our own)—J. G. A. (we have plenty of our own)—H. and L. (we have plenty of our own)—J. W. C. M. N. M. (shall appear)—D. W. & Son (see below)—J. W. C. & M.—L. G. (four replies in children)—C. S. & Co.—B. & Co.—J. B. (you had better ask the architect)—T. S. S. (we can hardly be expected to contribute in the state of your business)—W. S. & H. T. & Co. (shall appear)—R. F. (under our mark)—S. (in last week)—W. T. F. (appeared last week)—M. F. D. (next week).

Correspondents should address the Editor, and not the Publisher, except in cases of course.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the author.

We cannot undertake to return rejected communications.

Letters or communications of a violent nature, news items, which have been duly ruled for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE PAGE for Volume XLV (July to December, 1883) were given as a Supplement with the number of January 12, and a COLOURED TITLE PAGE was issued the following week. In substitution for that not yet prepared.

CLOTH CASES for Binding the Numbers are now ready, price 2s. each.

READING-CASES (Cloth), with strings, to hold a Month's Numbers, price 2s. each.

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SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

PERSONS Advertising in "The Builder" may have copies addressed to the Office, 46, Catherine-street, Covent-garden, W.C. free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied once from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum, PREPAID. To countries within the Postal Union, 25s. per annum. Remittances payable to DOUGLAS FOURDRINER, Publisher, 46, Catherine-street, W.C.

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LONDON, LIVERPOOL, GLASGOW
VIRILE MONTAGNE BRAND.
NO SOLIER.
NO EXTERNAL FASTENINGS
PARTICULARS ON APPLICATION. CHIEF OFFICE: 360, EUSTON ROAD, LONDON.

The Builder.

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The Pollution of the Thames, and its Influence on Health, Wealth, and Commerce.



HE Report of the Royal Commission to inquire into the pollution of the River Thames by the discharge of the sewage of the metropolis, which was laid on the tables of both Houses of Parliament at the commencement of the session, has given the force of deliberate counsel to conclusions long since anticipated by impartial inquirers. Properly speaking, indeed, there was no question open on the subject. If the crude sewage of a city containing more than four millions of inhabitants could be poured into a river of the modest size of the Thames, without serious ill effects, it is plain that the whole theory and practice of modern sanitary improvement must be a mockery, a delusion, and a costly humbug. The case has not hitherto been investigated on its merits, but has been fought out on party lines. The Conservators of the Thames have been ill advised. With an unanswerable case in their hands, they adopted a mode of treatment which courted defeat. It encountered what it thus courted. The Conservators protested too much. They fought, to some extent, against themselves. For a series of years they have been carrying on operations in the Thames which are steadily improving the channel of the river below London. The tidal range has materially increased under their well-designed and well-executed efforts, and is still annually increasing. Gradually and systematically the shoals and shallower portions of the channel have been removed and deepened, and the improvement of our most ancient and most famous river harbour has fully kept pace with the improvement in our modern navigation.

Coincident with this material improvement in the channel of the Thames has been the deterioration of the river from the discharge of the sewage of the metropolis. This deterioration has been of a two-fold kind, chemical and physical. These two sources of mischief were each capable of actual proof. But, while the chemical evil is one that can be tested, day by day and from place to place, the physical evil is more difficult, not only of proof but of determination. We can, indeed, calculate

what minimum quantity both of inorganic and of decaying organic matter is daily thrown into the channel of the Thames; but how much of each is daily swept away is a matter of constant variation. It depends on the three elements of tide, of wind, and of land flow and flood. That it effects no permanent lodgment, except in exceptional cases, is to be anticipated from the very fact of the steady improvement of the river by the Conservators. Thus, while evidence is at times attainable of the formation of masses of foul mud at given localities, every one who is familiar with the action of tidal rivers knows that where a bank is formed to day it may be sought in vain to-morrow. In the case of the Mersey it is in evidence that where an engineer has stood one day on firm dry sand, he has found on the next day sixteen feet of water.

For this reason the attempt of the Conservators of the Thames to prove that the Barking outflow was choking up the river was an error. One day it might be shown to do so, on the following spring-tide improvement may have got the better of deterioration. Two forces were at strife, with variable results; but as, in the long run, the *plus* force is stronger than the *minus*, any attempt at the independent determination of the latter must be futile. The greater the success of the Conservators of the Thames in the discharge of their duties, the more difficult was it for them to show to what extent they were impeded by the action of the Metropolitan Board of Works.

That several years would have been saved if the Thames Conservators had followed the advice that recommended them to give their main attention to the chemical, rather than to the physical, part of their case, is now proved by the report of the Royal Commission. In temperate and well-balanced language the Commissioners have now given the sentence of an impartial tribunal. That sentence has established facts as to which it is difficult to see how any serious doubt could be at any time entertained. But it is one thing to have a good case, and quite another to be so served and advised as to put that case in its true light. Without now referring to past efforts to that effect, it is satisfactory to be able to sum up the conclusions of the Royal Commission.

That the discharge of the sewage of London in its crude state into the river, during the whole year, is at variance with the understanding in Parliament on which the Act of 1858 was passed, is the first statement of the Commission, in point of order; and is one of no little importance by way of clearing the ground. It is, of course, well known to those who have studied the facts, but the opposite

has been the contention of the Metropolitan Board of Works. Further, as to this, the Commissioners report that "the sewage from the northern outfall is distributed partly over the foreshore, and not, as was the original intention, through submerged pipes terminating below low-water mark; this arrangement increasing the risk of nuisance from the discharge."

In accordance with what might be anticipated from the above facts, the Commission find that "the discharge from the main outfalls becomes very widely distributed by the motion of the water both up and down the river; being traced in dry seasons through the metropolis and almost as high as Teddington." Between Greenwich and Greenhithe, that is to say for about seven miles up, and ten miles down the river from the discharge at Barking, "the effects of the sewage are more or less apparent at all times," while in dry seasons, and at neap tides, "the dilution of the sewage is scanty and ineffective." Oscillating up and down the river, the mass of sewage becomes partially purified by oxidation, the limits of such partial purification varying with the meteorological conditions. But that at Erith, and elsewhere, foul mud, partly composed of sewage matter, accumulates, and adheres to nets, anchors, and other objects dropped into it, that sand obtained from parts of the bed of the river where it used to be obtained in a pure state is now so contaminated with sewage matter as to be unfit for use; and that fish have disappeared from the Thames for a distance of some fifteen miles below the outfalls, and for a considerable distance above them, are facts of unmistakable significance, which are now fully established by the Report of the Royal Commission.

A new and very important statement is contained in the Report, to the effect that wells in the neighbourhood of the Thames are affected by the water of the river. Thus although it has not been shown that hitherto the sewage discharge has had any seriously prejudicial effect on the general healthiness of the neighbouring districts, there is evidence of evil effects on the health of persons employed on the river. "There may reasonably be anxiety on the subject for the future," more especially as "the evils and dangers are likely to increase with the increase of population in the districts drained."

Thus far the report deals with the sanitary dangers to which the metropolis and the riverain residents of the Thames valley are exposed by a mode of dealing with the sewage of the metropolis which can only be described as a scandal to our legislation. Nothing above cited (except what is said as to the wells) is new. There is nothing that has not

been repeatedly urged before in our columns, and in many other places. And we are bound to add that there is also nothing, or at least very little, that has not been flatly denied by the advocates of the Metropolitan Board of Works. It was not the case that any honest doubt existed in the matter. But disputes did exist. Every statement of the defenders of the purity of the Thames was either ignored, contradicted, or ridiculed. The evidence of those persons who went on an unsavoury pilgrimage to Barking or to Erith was frittered away by expert cross-examination. The main drainage of London, we were told, was one of the most brilliant engineering works of the century. Who would set the grumbings of a few anglers or painters, or occupants of damp and mouldy riverside hovels, against such a noble measure? And this view, as being enforced by a body of the preponderating weight of the Metropolitan Board of Works, has hitherto, as far as the general course of public opinion is concerned, quite overborne and obscured the truth.

This, however, is by no means all. Quite independent of the aspect of the sanitary influence of the condition of the river on the residential population, is that of the corresponding influences on commerce. "For these reasons," the Commission report, "the river is not at times in the state in which such an important highway to a great capital, carrying so large a traffic, ought to be." Is that traffic a matter with which to trifle? What is its actual amount? In the year 1881 the tonnage of British and foreign vessels, sailing and steam, with cargoes and in ballast, that entered and cleared the port of London, amounted to 9,388,000 tons, or between a sixth and a seventh of the corresponding tonnage for the whole United Kingdom. If we look back as far as the statistical abstracts for the United Kingdom enable us to do,—that is to say, to 1867,—we do not find that London, as it is, maintaining her ancient pre-eminence as a port. Her total tonnage has, indeed, increased by 50 per cent. in fourteen years; but the tonnage of the United Kingdom has increased in that period from 36 to 58 millions of tons, or by more than 60 per cent. And what has been the increase in those ports on which the skill of the engineer has been employed for the service of navigation? The number of vessels of 500 tons and upwards cleared from the Tyne in 1861 was 246. In 1881 it had risen to 4,625, being an increase, in twenty years, of 1,780 per cent.! On the Clyde, the total tonnage entered at Glasgow in 1831 was 732,327; in 1881 it was 3,057,532. In 1831 the tonnage of vessels at Liverpool was 1,592,436; in 1881 it was 7,893,948. A traffic of magnitude nearly equal to that of Liverpool has been created through the Suez Canal in thirteen years. In 1870, the year of opening, the ships that passed were 486, with an aggregate tonnage of 436,000 tons. In 1883 the ships were 3,198; the tonnage, 7,122,000 tons. Ports and harbours, and inland waterways, cannot afford to go to sleep in our days. They must either advance or decline. The clearances from Liverpool in 1881 were positively more than those from London; the figures being 4,796,671 tons from the Lancashire port, and 4,478,260 from the capital. Can it be contended that the neglected state of the Thames, from the shores of which so much of the shipbuilding industry has fled to the banks of the Clyde, the Tyne, the Wear, and the Tees, has nothing to do with this displacement of the centre of commercial gravity?

The Commission have resolved, as it seems to us very wisely, to allow some time for the consideration of their report before they proceed to inquire as to "what measures can be applied for remedying or preventing the evils and dangers resulting from the sewage discharge." This caution, opposed as it is to the frantic haste with which measures for dealing with great engineering systems, such as that of the water supply of London, are flung on the table of the House of Commons, may well be imitated by other bodies. And at the present moment there is an especial reason for the caution. It will be impossible to deal adequately with the subject of metro-

politan sewage without in some degree entering into the co-related subject of metropolitan water supply. The quantity of water that was supplied by the eight great metropolitan water companies in 1882 was 141½ million gallons per diem, being more than one-third of Mr. Beardmore's estimate of the ordinary daily flow of the Thames. Of this about half is actually pumped out of the Thames, diverted through the water pipes and sewers of London, and returned to the river at Barking in the shape of sewage, together with an equal quantity of similarly polluted water from the New River, the River Lea, and the springs of Kent, and the polluted storm water when it rains. In any project for dealing with outfall, due attention must be paid to inflow, and what at the present moment is of cardinal importance in this respect is, that such a change has taken place in public opinion on the subject as must lead to disastrous results, unless it be brought under the control and revision of some such impartial body as the Royal Commission.

In all the provisions for the water circulation of London, including both supply and sewerage or discharge, it has been up to this time assumed that the more water that is run through a house and its drains the better for the public health. Thus, not only has the large supply of from thirty to forty gallons of water per head per diem been encouraged by the Legislature, but the very basis of legislation has been the assumption that such a circulation was in the highest degree desirable. Thus all the laws as to water-rates have been passed with a two-fold object; first, to encourage the largest possible water supply, by charging, not per ton of water used, but in proportion to the rateable value of the property supplied with water; and, secondly, so to distribute the rating that, to a great extent, the more wealthy inhabitants should pay for the supply of their poorer neighbours. Thus the aristocratic district watered by the Grand Junction Water Company charges 1½d. per metric ton of water supplied, while the poorer district watered from the River Lea only pays 1d., and a similar disparity will be found to exist between the richer and poorer neighbourhoods in the same water districts. In fact, the rule has been payment on value of property, not on consumption of water. The reason has been that, if the latter had been taken as the gauge for rating, the poor would not have used a gallon that they could have spared, and thus the water circulation would have been diminished, the outflow checked, and the sewage would have been less diluted.

It is unnecessary, for the moment, to attempt to discuss the question as to which of these two principles is the true one. Much may be said on either side. But two points are essential to bear in mind. First, there is a conflict of principles. It may be well to encourage a consumption of forty gallons of water per head per diem, or to seek to restrict it to seven or eight gallons. But the two aims and objects are incompatible. Secondly, the first of these objects having been hitherto assumed as proper, and the water legislation of London having been based on that assumption, it is not only vain, but reckless, to attempt to overturn the arrangement by a side wind, as the Corporation of London proposes to do by their Water Bill. The actual quantity of water consumed in a house is only one element of the cost of water supply to that house. The working expenses of providing that supply are only about half the whole expenses of the provision. And of these working expenses, those dependent on quantity,—viz., pumping, filtering, and storage, form less than forty per cent. Out of the present cost of 7½d. per 1,000 gallons of water supplied over the entire metropolis, the three items thus dependent on quantity amount to only 1½d., or rather less. Thus, any idea of effecting a saving of expenditure at all corresponding to the saving of water is only based on a total ignorance of the problem which it is proposed to solve. It may be,—or it may not be,—better to effect an entire change in the principles of the supply of water for sewerage purposes. For the last forty years at least the aim of the Legislature

has been to stimulate that supply. What the poor consumer would avoid as unnecessary, if he had to pay for it, is supplied by Act of Parliament in such a manner that it is not his interest to stint the water that he draws. What one person calls waste, another person calls sanitary supply. The matter perhaps requires threshing out, but the main point is, that any change in the present regulations can only be safely effected in view of all the conditions of the problem. It is no more possible to supply ten gallons of water per day at the same price per gallon as forty gallons, than it is to effect any other of those marvellous economies that seem so simple to persons who are ignorant of the controlling rules of any kind of industrial enterprise.

DRAWINGS AND PICTURES OF CATHEDRAL CHURCHES.

It is, no doubt, reasonable that in estimating the success of a painter, due regard should be paid to the difficulties of his subjects; and of all the many subjects for the artist there is perhaps none which presents more difficulties than the faithful and intelligent representation of architecture. In saying this we do not overlook the subtle play and variety of line and expression in the human form, or the multitudinous complexities and fiftful, changing aspects of natural landscape. In these the organism of each class is constant under an infinite variety of accidental differences, and the characteristic structure and anatomy of a man, as of an oak, can be deliberately and leisurely studied, and once mastered is for ever known. But one building differs from another both as to its external dress and as to its organic structure, and the differences are not merely "skin deep." The painter who would give us a satisfactory portrait of a fine building must appreciate the *rationale* of its frame and the part which every structural line plays in the general economy of the fabric. He must get at the idiosyncrasies of each specimen, and identify himself with the mind of its designer, and for this the closest and most critical study of a very complex problem is essential. On the other hand, there is a danger in being over-wise. The painter of architecture must be something of an architect, or he will not really see what the building he would represent has to show to him. The entire absence of all knowledge of Gothic art in the last century led the best of painters who had *wit* enough to admire its graceful and forlorn beauties to misrepresent grotesquely the very features which charmed them. But architects make bad painters of a subject of which they well know all the details. In fact, they know too much, and paint what they know to exist rather than what they see, so that the completeness of intimacy with architectural minutiae which is invaluable to them as architects is fatal to their success as painters.

To turn to their fullest account the opportunities which architecture offers to the painter, he must be also something of a poet, and represent the works of his brother artists under those effects, and in those associations, which will best bring out their spirit. "The gay beams of lightsome day" are not always the best suited for eliciting the full beauty and meaning of architecture; nor is the sadness and gloom of the day's decline in harmony with the genius of every work of art. Above all, the painter must be specially educated in the relation of the several parts of the structure to the whole, and in suggesting, at least, the leading characteristics which differentiate its abounding wealth and variety of enrichment.

Of late years our painters have not concerned themselves with architecture as a speciality. Each one may take it up from time to time in a casual way, but it will not yield its best results to merely casual treatment. Its grand and wide possibilities are matters for the study of a lifetime, and even then the study, to be successful, must be systematic and thorough. It may be long before we meet with a painter such as David Roberts, who, with the most enchanting simplicity of means, was able to suggest with perfect accuracy the

utmost intricacy and variety of architectural detail,—who never lost the true character of the parts in striving for breadth, and whose most patient elaboration of details never interfered with the effectiveness of his work as a whole.

We have been led to venture upon these remarks by a visit to a collection of nearly forty paintings and drawings of architectural subjects at Messrs. Dowdswell's gallery in Bond-street,—all the work of Mr. Wyke Bayliss, a painter who has identified himself with works of this character, and who is, moreover, well known as a thoughtful and singularly attractive writer on art.

It is gratifying to find an artist of Mr. Bayliss's powers devoting his energies to the delineation of a class of subjects which are fast passing away. He is above all things a poet,—and nothing passes under his pencil that he does not invest with something of poetic glamour. He is persistently and determinedly anxious to evoke the genius of each spot, to enliven his scenes with appropriate incident, and to insist upon the peculiar and special beauty and impressiveness of each subject.

And yet we are reluctantly compelled to say that he is only partially successful. This is a qualification which might, perhaps, be added of all human effort. But in these elaborate and ambitious works there are distinct points of weakness, and shortcomings which are not mere matters of opinion or sentiment, but which can be measured or weighed. The results attained will, we fear, please neither the architect nor the painter, and will only please the public so far as they are ignorant of both architecture and painting. The former will look in vain for the true characteristics of much of the architecture portrayed, and the latter will note the absence of texture and the loose scattered effects which in almost every case mar the work as an artistic composition. The aerial tones which lend such a charm to cathedral interiors are but imperfectly rendered at the best, and sometimes are not attempted at all, or the attempt is defeated in the effort to delineate an impossible amount of minute accessory detail. The water-colour drawings are unsubstantial and "papyry," and the oil pictures are too suggestive of mere paint. The interior of the Sainte Chapelle is a case in point. The universal colouring which covers every inch of wall-space is wrought to the highest pitch of brilliancy, and the recurring ornamental features made out with provoking iteration, until the resources of the palette are exhausted, and there is no force left for the transparent brilliancy of the stained glass, which, as here represented, is not glass at all.

In the interior of Chartres the artist has been much more happy, and has succeeded in bringing out the "crimson splendour" which shines through the great rose-window,—

"When the day hath waned,
And the great orb goes down in calm repose."

Judging from a comparison of several treatments of the same subject, we should infer that Mr. Bayliss idealises his subjects a little freely,—that, perhaps, his pictures are painted from comparatively slight sketches, and that the absence of certain truths of texture and detail, and of the effects of light and space, and the due relation and relief of the objects delineated, may be thus accounted for. Without pretending to any personal knowledge of Mr. Bayliss's course of study, we should be inclined to doubt whether he ever drew the details of Gothic architecture at all as Mr. Ruskin, for instance, has drawn them. The capitals of the choir shafts in No. 11, and the carving in No. 2, and similar portions of other examples, suggest a want of acquaintance with the distinctive peculiarities of a most characteristic phase of Gothic sculpture.

It is, perhaps, not too much to say that all the figures, as now treated, would be better out of the way. They are not well drawn. They are, in some instances, fatally over-elaborated, and though appropriate enough in general motif, they injure rather than improve the composition. The little boy-

choristers in the Westminster Abbey picture may be excepted from this criticism; but this picture, as a whole,—one of the three English examples included in the series,—is anything but a successful rendering of our incomparable abbey.

Mr. Bayliss writes about architecture eloquently, enthusiastically, with the ardour of a true poet, and we have no difficulty in crediting him with the possession of a sincere devotion to the art which we love best. He has bestowed infinite pains in the endeavour to transfer his vivid impressions to canvas, and has thus earned our gratitude; but his imagination cutstrips his hand.

Strange to say, he is most nearly successful in his most ambitious works, and in the large interior of St. Mark's he is to be sincerely congratulated. But there is much to be done before he can claim to have given full effect to the art which has enlisted his admiration.

THE BUILDING TRADE IN PARIS.

If there is an admission which in every-day conversation is generally conceded it is that "surely a man may be considered to know his own business," a remark, it may be noticed, which will very frequently be supposed to meet the objections raised on some point by any one who may be regarded in the light of an "outsider." Now, apart from that thoroughly-acknowledged maxim that lookers-on contrive to see more of a game than those playing, can it be denied that it is a very constant occurrence for men of business to singularly err in their calculations? And their errors, let it be observed, only too commonly arise from an over-readiness to secure what appear to be sure profits. Such miscalculations are more frequent in the present day than formerly from this very reason, that the desire for large returns is more marked than in the past. Had but the voice of the despised outsider been more often attended to, many of the crises and crashes of late years might, probably, have been avoided. Approaching the subject as the outsider does, with a degree of judicial calm and impartiality scarcely possible to those directly interested, his observations, unheeded at the moment, prove only too often correct when the hour of crisis has come.

There are probably few cases in which an over-rash haste and miscalculation have led of late years to more fatal results than in that of the building trade, and the same acute crises have followed infallibly not only in England, but in France, in Germany, in Austria, and even across the Atlantic. A too eager haste in calculating on suppositions bases the promised returns, an absence of that stolid and unenthusiastic calm on which men of business so largely pride themselves, have, in an almost unaccountable manner, turned the heads of the gravest, and everywhere with the same lamentable results, from which it is sincerely to be hoped some lesson will be taken for the immediate future. Readers of the *Builder* have been made aware of the consequences, in their effect upon the building trade, which have attended, in aristocratic Germany and Austria, the wild speculation which followed on the golden years succeeding the Franco-Prussian war; in Republican France something of the same spirit has roused the speculative demon among capitalists and investors, and already, as will have been gathered from an article in our last week's number, the fatal results of an over-eager haste are making themselves severely felt, and are clearly apparent to the stranger who may at the present moment pay a visit to the banks of the Seine. Whole neighbourhoods erected in the more favourite portions of the capital, such as the newly-erected Quartier Marbeuf, and the slightly more settled Quartier Monceau, remain, in spite of their attractiveness and general splendour, but scantily tenanted, not perhaps so lugubriously deserted as some of the similar creations to be met with in the outskirts of Berlin, of Vienna, and other large German and Austrian cities, but with the significant white and yellow placards of "To Let" staring in every direction, to tell their tale to the passer-by.

Now, may not this far from satisfactory position be directly traced to a singular absence of that knowledge of their own affairs with which it is asserted men of business should at least be fully credited? A too hasty calculation has been made by the speculators on the increase, not perhaps so much of the Parisian population as on their ability to pay high rents. Had but a calm unbiased inquiry been made into the nature of the recent increase in the number of inhabitants of the French capital, the speculations of the last few years would not have been so wildly conducted, and a large number of workmen would not now be thrown out of employ. It is advisedly we speak of "wild" speculation, for such has been the nature of the building mania on the banks of the Seine within some five or six years. Up till the year before last, never, even in the busy days of the Second Empire, have the building operations in Paris been so extensive, as is amply proved by the statistics of the *octroi* or town dues paid on the building materials which enter the capital, and which from 1879, when they stood at some twelve millions of francs,—hard on half a million sterling,—have steadily year by year increased till 1882, when they stood at the enormous total of over nineteen millions of francs,—some 760,000*l.*, the corresponding figures for 1869, the busiest year of the late Empire, having only been fourteen millions of francs,—some 560,000*l.*

These statistics, showing merely the town dues paid on the materials brought into the city, prove the feverish activity of the building trade within the last few years. Demolition has been universal; whole neighbourhoods have disappeared to make place for huge blocks of handsome five and six story stone-built *maisons de rapport*, divided into numerous *appartements*, or, as we term them, "flats"; for the number of *petits hôtels*, as the private houses are termed occupied by one person or family as in England, are comparatively few.

After a period of unexampled prosperity, in which the State and the municipality have done everything in their power to aid the speculators, the inevitable reaction has set in, but from causes against the disastrous effects of which a reasonable amount of calculation might have largely protected the chief sufferers. In almost every case the speculators, to whom the French metropolis owes the erection of the enormous number of dwellings intended to accommodate the expected increase of population, have made the singularly incorrect calculation that the tenants would be able to pay very much higher rents than have hitherto been usual in thrifty France, where large house-rents are not nearly so common as in our country. The calculations upon the increase of population were correct enough,—in the five years between 1876 and 1881, amounting to 60,000 additional persons,*—but the calculations upon the income and means of these immigrants were made upon a wrong basis. Apartments at from 80*l.* to 600*l.* rents were not wanted, or rather not so large a number of them, but any number of dwellings at 40*l.* and under. As a consequence, there has been a growing demand for such apartments, and a proportionate rise in their value. Had but the over-greedy speculators,—men who must be supposed, of course, to know their own business,—consulted the annual tables of statistics prepared by the municipality, they would have discovered that considerably over half a million of the two millions of people in Paris live in apartments for which they pay a rent of less than 1,000 francs (40*l.*), while barely a tenth of that number are able to pay more than 40*l.*† As for the question of supplying houses for the working classes, that would appear to have been almost entirely neglected on the banks of the Seine. The houses originally thus occupied have been demolished, and their place taken by huge blocks professedly intended for

* The French census, it may be mentioned, is taken every five years, not, as with us, every ten years.

† These statistics have been made all the more familiar to the public, as a recent municipal law is about to base the rates proportionally upon the rental of the rate-payers.

a class of tenants able to pay far higher rents than any workman and his family can afford.

And hence, from a miscalculation on the part of men of business,—men who might surely be expected to know their own affairs,—a most important branch of industry is in a languishing condition, and with it a whole host of kindred trades, at a moment too when they are already suffering from the effects of foreign competition. In one important direction, as we briefly indicated last week, Norway and Germany have been sadly interfering with the French timber trade, as they have, indeed, with our own. Apparently inexhaustible supply of raw material, aided by the most modern application of machinery worked by cheap labour, has enabled Germany and Norway to supply France, as it does England, with ready-made doors and windows at a price which utterly beats down all possibility of competition on the part of those not provided with the most modern machinery, a large supply of raw material and cheap labour—all features the absence of which places the Parisian carpenters and joiners, skilful though they are, at a sad disadvantage in comparison with their Scandinavian and German competitors, but even with their brethren in the provinces. The purchaser will inevitably go to the cheapest market, and there has been no deficiency in the supply of what with the building activity of late years has been largely in request.

In the meantime, work continues feebly. Fortunately, neither the mania nor the crisis has led in Paris to any of that scamped work which in our country is too often observable. The houses erected are, indeed, adornments to a city which, in spite of certain critics, it is impossible for those familiar with its features to find "plain." So good, indeed, is the work, that merely on this score criticism is disarmed. But the chief difficulty remains. Who are to occupy all these handsome apartments which have been so lavishly built within the last ten years? Who at least are to occupy these apartments at the rents now being demanded? One hears it said that the Americans are beginning to like London, after all, quite as well as Paris, and it really seems as if it were only the Americans,—the Americans of modern fabulous renown,—who could pay such rents as are the rule in the more favourite neighbourhoods of Paris. To meet this difficulty we hear that already many landlords have been making arrangements to lessen the magnificence of their apartments, and at the same time lower the rents. This step may, perhaps, if more widely followed, be successful. In such a case as the chief objection of high rents being reduced, it is satisfactory to think that, whoever may be the tenants of these newly-erected houses, they will have every reason to feel satisfied with their homes. In this respect they will, we suspect, be a little more fortunate than their English fellow-sufferers, saddled with burdensome leases for houses which give but small satisfaction, unable to obtain lengthy leases for houses found comfortable, still further annoyed by being prevented, by reasons of common sense, from carrying out improvements for which no compensation will be allowed. Is it wonderful that under such conditions, people in England, especially in London, are beginning to spend more and more of their time in the country and abroad away from the sunless fogs and the smoke, away from the expenses of a house in town and its social accompaniments,—too often social mortifications,—and away, in fact, from the vexations of house-keeping generally?

Let, therefore, a warning be taken in time by our speculators in house property; let them, if they wish to be men of business who really know their own affairs, read the signs of the times, and not madly build whole neighbourhoods of houses for a class of tenants who exist only in imagination; let them, to use a familiar expression, see which way the wind is blowing, and before they are led into the error of their brethren in Paris,—and, for the matter of that, on the Continent generally,—let them think twice before they rush wildly into the kind of speculation which has already

more than once, from want of cool calculation, landed us in our country in the ditch.

NOTES.

THE discussion or conversation about the Wellington Statue which took place last Friday in the House of Lords afforded another curious instance of the entire inability of the majority of men even of large general culture to understand the real points of the case in regard to a question of this kind. Among eight or nine noble lords who contributed various opinions on the matter, not one seemed to have an idea as to the real reasons for the unsuitability of the statue to its former position on the arch, on which the Duke of Buccleuch actually wished to see it reinstated. Yet the reasons why the statue should never have been on the arch (quite apart from the question of its intrinsic merits) are perfectly simple and obvious, and have been repeatedly stated in these columns. The statue is out of scale with the architectural details, and dwarfs and crushes the whole erection; and it stands, or rather stood (necessarily) across the roadway,—otherwise, sideways on the structure, instead of frontways; "which is absurd," to adopt the Euclidean formula. It is needless to say that the *Times'* leader on the debate threw no new light on the subject, which could hardly be expected from a critic who referred to the monuments at Hyde Park and St. Paul's as parallel cases in which the Duke of Wellington had "not been well treated by sculptors;" the one case being that of a very inferior statue which spoiled the architectural design with which it was associated, the other that of a sculptured monument of remarkable power and originality, which has been placed so that it is impossible to see it. Both proceedings involve miserable artistic blunders, but of a precisely opposite character in every respect. But that is all one in a newspaper "leader," when questions of art are concerned. In politics it is necessary to have a point and an object in writing, but any twaddle may be talked about art, so long as the required space is filled up.

From the report of the previous day's proceedings in the House of Commons, it appears that according to an announcement made by the First Commissioner of Works, it is intended to form a committee to consider the best means of decorating and treating generally the newly-formed place at Hyde Park Corner. It would be interesting to know of whom the Committee is to consist, and whether there is to be any one on it who understands the effective laying out of sites, which the gentlemen of the Office of Works certainly do not. The First Commissioner observed that at present the place was a mere sketch which required filling in. It is merely that, and moreover it is a bad sketch, of which the leading lines ought to be redrawn before anything is gone into in detail. It is proposed to call it "Wellington Place." The objection which has been made to this, in regard to the number of streets and squares already called by that honoured name in London, should not be overlooked. "Hyde Park Corner" has become a world-wide name, but, of course, it may be replied that it is no longer a "corner." Why not call it "Apsley Place"? That would be both suitable and distinctive.

THE Society for the Protection of Ancient Buildings has addressed a note to the Bishop of St. Alban's, in reference to the threat of further restoration under the present management; a somewhat provoking letter, in which they are alternately right and wrong. They had hoped that "the commonplace character and incongruity of the new works at the west end of the nave would have opened the eyes of the bishop and other members of the restoration committee to the preposterous absurdity of the pretence that Mediæval work can be done in the present century." Of the commonplace character of the work (for our own opinion on which, see the last volume of the *Builder*, p. 172), there can be no question; but the right or wrong of the restoration question at

large is not to be judged by such bungling design as that by which Sir E. Beckett has been allowed to vulgarise a great building. Repair and reconstruction of architectural features may become necessary; it must then be carried out in the same style as the original; but this can only be adequately done by some one who is an artist as well as a constructor, and who by long study of Mediæval detail has been able to enter into, and (as far as modern hands can do so) reproduce its spirit. The Society exclaims against the proposed raising of the transept roof; but it is too late to do that now; the transept roof naturally follows the nave roof, whenever its reconstruction becomes necessary. Whether it is so or not, we do not know, not having examined it, and not being in the habit, like the Society, of expressing opinions as to what we have not seen. The announcement of the restoration of the altar-screen, under the superintendence of Sir E. Beckett, is another matter. That is purely artistic work, which he is quite incompetent to superintend. But as not one person in a hundred in English society knows good architectural detail from bad, or could even perceive that there is any difference, any lecturing on the subject is somewhat like talking about differences of colour to a blind man.

MR. FERGUSON'S letter and plan in regard to the extension of the area available for the interment and the commemoration of great men in Westminster Abbey, which are given elsewhere in the present number, will no doubt be read with interest by many. Mr. Fergusson is probably right in thinking that a new building in proximity only (however close) to the Abbey, will not be regarded by most English people as equivalent to the Abbey as a burying-place for those whom the nation delights to honour; and he has shown his usual ingenuity in planning an addition, so as to present, in its method of access, more the appearance of being part of the Abbey than would have been the case with any of the previously suggested schemes. We must object, however, to the application of the term "transept" to his proposed addition, as its structural relations to the main building are so entirely different from those of the class of erection to which the word transept has always been applied, and the word really does not describe it. "Monumental chapel" would be its correct designation. The word "transept" may have been selected to convey an idea of the more close union of the proposed new building with the original; but this is a verbal illusion only; a glance at the plan shows that it is not a "transept." We must also express surprise that Mr. Fergusson, who has so strongly urged the incomplete character of the wooden-roofed English churches, as compared with the vaulted ones, should for one moment have suggested a wooden roof (especially such a make-believe as a wooden vault) for a building of this type. Surely in a monumental chapel, if anywhere, we should endeavour to "build for eternity," and, like the Regent, "never mind the expense."

WE must enter a protest against that part of Mr. J. D. Crace's excellent paper on decoration printed in our present issue which deals with the internal treatment of domes. Mr. Crace strongly recommends the employment of vertical lines, as in St. Peter's at Rome and the Invalides at Paris, where ribs radiating from the eye of the dome towards the base produce a number of triangular panels, which are in themselves subdivided by circles and spandrels for decoration. To treat a dome thus is to destroy all the poetry of its expression and effect, as well as to contradict its constructive principle. Mathematically, it is true, the "element" of a dome is a semi-circular arch starting from any given width at the springing and narrowing (on plan) to a point at the crown, as distinguished from that of the simple arch, with voussoir of equal mass from springing to crown. But this is only a convention for the convenience of static analysis. Architecturally, a semicircular dome is a homogeneous hemisphere, no portion of

the surface of which is constructively accentuated. The decorative treatment in vertical ribs and panels would be perfectly right for an octagonal dome such as that of Florence, but to cut up a fine hemispherical dome in that fashion, however sanctioned by precedent, is to destroy the very beauty which specially characterises the dome, the idea of mystery and infinity, and to parcel it out into measurable littlenesses.

DURING the recent gales Carew Castle, the latest and perhaps the most beautiful of the Pembrokeshire fortresses, sustained considerable damage. In more than one place the walls have been much injured, and unfortunately the proprietor lives at too great a distance to supervise the repair and safe custody of his interesting property. Mr. Butterfield has expressed an opinion that Carew might, without difficulty, be rendered habitable, and there can be little doubt that even more might be done for it than has been done for its neighbours, Manorbier and Pembroke castles. Mr. J. R. Cobb, of Brecon, has in both of these ruins fitted up for himself a sufficient abode, and the result has been a more accurate knowledge of the parts and uses of each of these structures than can be obtained through the hasty visits of "pionicing" antiquaries. In the last two numbers of the *Archæologia Cambrensis* will be found an interesting account of Mr. Cobb's discoveries (for such they may be termed) at Pembroke Castle, and it may be well to draw attention to his remark that "the large-scale Ordnance Map is misleading in some respects; markedly so as regards the Monkton tower, the great gate tower, and the curtain between the north gate tower and the Mills postern."

THE Burlington Fine Arts Club propose to exhibit during the coming season a collection of drawings of architectural subjects by deceased British artists. The type of drawing which they especially require is that in which, while the primary aim of the draughtsman has been to represent the architectural character of a building, the subject has been regarded from the artist's rather than from the builder's point of view. They would exclude, on the one hand, "professional designs," such as plans and elevations (professional drawings they probably mean), and, on the other hand, landscapes in which a building, though nominally the subject of the drawing, is made subordinate to a merely pictorial treatment. Such an exhibition ought to be of great interest, but it will require a good deal of explanatory criticism to bring all its points before those of the public who are admitted to see it; and it is to be hoped that in making out a *catalogue raisonné*, the aid of some one really learned in architecture will be secured, and that the task will not be turned over to a merely literary or archaeological showman.

DR. REICHENSBERGER, an Honorary and Corresponding Member of the Institute of British Architects, has addressed to them a letter,—the major part of which is printed in the last issue of the "Proceedings,"—on the present state of architecture in Germany, from which it would seem that German architects are in pretty much the condition of bondage to shams and conventionalities from which we flatter ourselves that we have emerged. The prevailing fashion has lately been Renaissance for such buildings as pretend to anything beyond Utilitarianism; and such buildings, Dr. Reichensperger thinks, are quite below what are executed in Italy and France in the same style. The ornamentation is executed "in cement, zinc, and other makeshift materials; projections and balconies are supported on iron disguised as stone," &c. The principal adverse influence to artistic progress in German architecture seems to be the conventional taste which is practically imposed by the Legislature, and which reduces architectural style to a kind of official pattern-book, at variance with all truly original and artistic inspiration. There is, however, we are told, "room for hope"; but not, apparently, for much else.

IRON UNDER TEST AND IN CONSTRUCTION.

A SUBJECT was referred to in a recent number (see p. 178, *ante*) as having been brought before the Institution of Civil Engineers, which may prove to be of no small importance as regards structural design. We are not prepared to offer any decisive opinion as to the accuracy of the conclusions, originally published by M. J. Barba, in the *Mémoires de la Société des Ingénieurs Civils*, and now urged by Mr. W. Hackney, Assoc. Mem. Inst. C.E. The question which occurs to us as of cardinal value to the architect or to the engineer is, if the views now put forward are correct, what will be their influence on the theory of design, whether graphic or analytic, in all cases where iron is used in a state of tension?

The statement to which we refer is to the effect that in breaking pieces of the same quality of tough metal by direct tension very different results are obtained according to the form of the test-piece employed. Test-pieces of the same proportionate form,—that is to say, in which the proportion of length to cross-section is equal,—give, according to M. Barba, like results, whatever be their size. But test-pieces of equal length but different cross-sections, or of like cross-sections but different lengths, give different results, measured in percentages of length stretched, varying as much as from 28 per cent. to 44 per cent. The ultimate stretching of test pieces cut from the same bar of mild steel of different proportionate lengths is thus given:—

Ratio of length to diameter.	Ultimate stretching per cent.
2.51	44.5
3.75	37.5
10.00	28.2

These proportions are given as those of round rod steel, but it is added that in the case of steel bars and plates a corresponding result is obtained.

We need not now enter into the further details brought forward in the paper. The general law indicated, or assumed, is to the effect that the tensile resistance of iron is not attributable only to the chemical or physical state of a given sample, or to the area of cross section, but that it further differs according to the proportion of cross section to length in the bar undergoing tension. The inference of the author of the paper, assuming the law to be correctly stated, is no doubt sound and good. It is to the effect that the adoption of uniform dimensions for test-pieces, in all parts of the world, is desirable. "If a uniform system of testing could be generally introduced, so that tests made by engineers in all parts of the world might be directly comparable, the advantage would be very great." With that we may all be disposed to agree. At the same time, the difficulty, it may be presumed, of establishing any such uniform rule would be formidable. Nor does it seem to us that the adoption of normal dimensions for test-pieces, if it were practicable, would be the only, or even the best, way of obtaining that further information which, if M. Barba's theory be correct, is of indispensable importance.

If proportion be so directly an element of tensile strength as is now intimated, the first thing to be done is to ascertain how, and then why, this is the case. And it is obvious that a definite statement, in all cases, of the dimensions of test-pieces, might furnish a greater variety of exact data than would be afforded by the adoption of normal dimensions. To compare one make or quality of iron with another, no doubt, the use of isometric test-pieces would afford the simplest method. But this is but a small part of the great structural question that is opened if M. Barba's views prove to be correct.

We confess to feeling a great difficulty in framing any theory, or exact conception, of the cause of what seems an unexpected anomaly. That a given metal should have a definite resisting power to tension per square inch of cross section, and that this power may differ in different samples of the metal, we all admit. That this resisting power may vary in some ratio to the size of the cross section, as, for example, that two bars of the same iron, of say 1 in. and 3 in. diameter, should have different tensile strength per square inch of cross section, is conceivable, though we think the idea is somewhat new. It is not, for instance, in

accordance with the results of Mr. Kirkaldy's experiments, which, as cited by Mr. D. K. Clark ("Manual of Rules, Tables, and Data," p. 581), gives almost exactly the same absolute strength per square inch for 1 in., 2 in. and 3 in. diameter round bars. But that in addition to this there should be a variation in the resistance of a given cross section of iron, at a given point, dependent on the length of the bar on either side of the point of strain, is very difficult to grasp. It is as to this that information is far more important than as to the particular strength of any particular brand of iron. And on this no light whatever can be thrown by the adoption of normal test-pieces; while, on the contrary, much light may be thrown by the use of test-pieces of great variety of proportions, so that all those proportions be accurately put on record.

For if a rule so strange and so complicated applies to test-pieces of iron, it must apply to all iron structurally used. Wherever a tie-bar has to be introduced in future (supposing the theory to be established), a new and very important element will be added to the cost of the designer; graphic methods will receive, at least for a time, a rude check. In fact, until the new law be not only worked out in detail, but brought within the province of direct mathematical analysis, our structural preparations must return to rule of thumb. How shall we know what tension a bar of steel will bear, for instance, in the Forth Bridge? What becomes of the experimental results obtained by Telford, by Barlow, by Fairbairn? Suppose that we take the tensile strength of Low Moor iron at its tabulated value of twenty-eight tons, and a little more, per square inch of section, that result will have been arrived at from careful trials of bars perhaps 20 ft. long. What guide will that be to us for a tie-bar of 1,000 ft. long,—if such is required? If increasing the proportion of length to diameter in a four-fold ratio be accompanied with a reduction of 33 per cent. in tensile strength, which is the outcome of the figures tabulated a few lines back, what will be the result of increasing their proportion by a hundred fold?

We are not for a moment attempting to throw discredit on the statements of M. Barba and his English commentator. On the contrary, we hold that, if they prove to be true, they must effect some great revolution in the science of construction. Their importance, as urged by their advocates, as a means of improving the mode of testing, is but very small as compared with their influence on the theory of construction. But the more important influence, the more needful is it to be sure of the premises. We must have an adequate basis of fact with which to deal; and not only so,—we must have a definite philosophical hypothesis before we can satisfactorily reason from such a basis of proved facts. We are unaware at this moment how far the new theory will be accepted by mechanical men; but, in the event of such acceptance, it is certain that too prompt attention cannot be given to the effect that such a recently discovered structural principle must have on the design of all future architectural or engineering work in iron of unprecedented size or proportions.

THE VENTILATION OF THEATRES.

PARKES MUSEUM OF HYGIENE.

ON Tuesday evening last, Mr. J. P. Seddon, F.R.I.B.A., read a paper on this subject at the Parkes Museum of Hygiene, Margaret-street, Regent-street,—Mr. George Godwin, F.R.S., in the chair.

Mr. Seddon commenced his paper by strongly denouncing the "fantastic demons" in the shape of cowls and "tall-boys" which have been so largely resorted to in London and other large towns for the cure of smoky chimneys, but, as he believed, in vain. Every cowl upon every chimney was to him a standing record of woe and waste. He urged that the main remedy for smoky chimneys is the free admittance of air to the apartments in which the fireplaces are situated. Passing on to the immediate subject of his paper, he said:—

Dr. Angus Smith, in his excellent work entitled "Air and Rain," gives a tabular statement of the results of the analysis of samples of air taken from various sources, including the interior of theatres. Some of those that were experimented upon from the dress-circles were found to be actually more foul and prejudicial

to health than others that had been collected from within the very sewers in the streets!

Now how many people are there who, though enjoying dramatic representations greatly, yet seldom go to a theatre, simply because, though not particularly delicate or fastidious, they invariably suffer afterwards from the effects of the bad and heated atmosphere in them, or from colds caught in consequence of the efforts they have made to escape from it during the intervals between the several acts? The audiences in theatres have, in fact, as a rule, to imbibe such a noxious compound of the products of gas-burners and human lungs as might well convert the comedy they have gone to see into veritable tragedy. Indeed, many a case of such transformation in private life can be traced to a single night's enjoyment of a lyrical entertainment.

How comes it to pass, then, that that beneficent goddess, Minerva (who was merely a personification of what we, in our more prosaic language, call fresh air), who threw so ample a shield around her votaries in ancient Athens, fails so sadly to accomplish the like good office when invited to do so in lands which she doubtless would call "Trans-Alpine"? Is it not because in the colder North her feet are ever dogged by attendant malignant sprites, whom, if we are to call a spade a spade, we should designate as draughts? No sooner do we, in this climate, open a door or window to let in a breath of the divine essence, than some one shrieks an entreaty for it to be shut again, and all because those spiteful fiends have contrived to force themselves in as well. Of course, in the open-air theatres of ancient Greece, their favourite deity hovered over the assembly in no other guise than that of a good fairy god-mother; but here she is followed by the evil genii, who, swift and sly as pinching Puck, rudely intrude through the numerous chinks and crannies.

To drop metaphor, however, and speak of what we ought to be anxious to admit as *fresh air*, and of what we should desire to expel as *foul air*, why can we not induce these to make their respective entrances and exits more graciously and gracefully, as well as more efficiently? Are not they like the rest of Nature's ministers to man, once barbarian, capable of being tamed and domesticated? Why should clerks in offices find it desirable to pile up ledgers upon Tobin's tubes as soon as days get cold? Or why should ladies in the stalls of a theatre fly to their wraps as soon as the lobby doors are opened after the curtain has fallen? There is, I maintain, no great practical difficulty in the matter, except what arises from attempting half-measures only; and it has been, in my opinion, in consequence of such half-measures, that the failures made hitherto have occurred.

What is wanted is simply a plentiful supply of fresh air, forced into every part of the interior of a theatre, and not to the auditorium only, together with the extraction of the foul air from the several parts where it collects. This, then, is the problem the solution of which appears to be still waited for alike in private and public buildings, and certainly in theatres. I propose, then, to consider it specially in its relation to theatres, than which there is probably no description of building more capable of being efficiently warmed and ventilated, while yet there is certainly none other that is so generally devoid of all rational provision for health and hygienic comfort. It is obviously opposed to the interests of the manager of a theatre to have his house ill ventilated, for the very fact of its being so is a most powerful,—perhaps the most powerful,—reason that so large a number of the population avoid theatres altogether. This deterrent is infinitely more potent and active than any conscientious scruples respecting the morality of the stage, and it alienates a much larger proportion of the public. Religious disapproval does, indeed, keep away some persons from the theatre, but their number is as nothing to that of those who absent themselves solely on account of the intolerable stuffiness of the atmosphere therein, and the almost inevitable headache that follows an evening spent in the majesty of theatres. On the contrary, a well-ventilated theatre means, *ceteris paribus*, a full house for most nights of the week. I have been told that a theatre at Manchester was, some years ago, notorious for the extremely defective state of the atmosphere within it for want of proper ventilation, and that it was, in consequence, very generally avoided, one lessee after another failing. But

at last a manager, more enterprising and more enlightened than his predecessors, hit the right nail upon the head. He not only took the theatre, but he thoroughly ventilated it, and in a few years he retired with a handsome fortune.

To the managers of theatres, and especially those of the lyric stage, good ventilation is also a matter of special importance, because it immensely improves the acoustic qualities of buildings. That annoying echo which muddles up the notes in tantalising confusion, is instantly removed as soon as a good system of ventilation is applied to a building. A notable instance of this has recently been brought to my notice in the case of the Church of St. John the Evangelist in the Wilton-road. There, previously to its being ventilated, the preacher's words were almost undistinguishable by any but those who were in the immediate vicinity of the pulpit; but as soon as proper ventilators were fixed in the roof, the echo disappeared, and the words of the preacher became audible throughout the church from one extremity to the other.

Then it is seriously to be remembered that few buildings in the present day are wholly disconnected from the street sewers; as their drain-pipes, in spite of traps, do form a means of connexion therewith. Now, theatres being the most highly-heated buildings of any, act the most powerfully as pumps to draw up the gases and vapours underground into their interior, with what results it is easier to imagine than describe. This is another cogent reason why greater care should be given to the ventilation of theatres than even to buildings generally.

Now if it be, as I have stated, not so extremely difficult to accomplish so desirable a purpose, why have almost all the efforts in that direction been otherwise than successful? The answer to this question I believe to be, Because those efforts have been generally confined merely to the extraction of the vitiated air by means of mechanical or automatic appliances, and that, in scarcely a single instance, has there been, in addition, any intelligent effort to introduce, by the same means, a sufficient amount of fresh air, constantly flowing in, in order to take the place of the vitiated air that has been extracted, and at such a regulated temperature as to be inoffensive, by reason of the absence of cold draughts impinging upon persons situated near the inlets. In consequence of this oversight the extracting appliances, of whatever nature, whether automatic,—as "lobster-back cowl,"—or mechanical,—as revolving or fixed forms of patented extractors,—have failed to act as desired, since they have no innate force of their own, and are utterly unable to produce a vacuum. The utmost that they are able to effect, therefore, is to draw in cold fresh air from the various accidental or temporary openings, chinks around doors and windows, down chimneys, &c., so creating draughts; or to drain towards the auditorium the still fouler and more vitiated air from other wholly unventilated parts of the building. These remarks apply likewise to sun-burners, and to the great gas-chandeliers so much affected in the older theatres. These only succeed in heating and expanding the air, and expelling *per tanto* the amount so expended. Mechanical extractors, such as fans, cylinders, pumps, &c., do indeed extract a considerable quantity of air from the auditoriums to which they are applied, and anemometers, in consequence, register thousands of cubic feet of air removed per minute, to the satisfaction of the patentees of such appliances. But, however satisfactory these results may prove to those gentlemen, they are not equally so to the unfortunate occupants of dress-circles, as the semi-exhausted condition of the atmosphere so produced there is more intolerable than a surfeit of even vitiated air would be; while to the stall-holders, blasts of the comparatively cold but far more highly vitiated air from the parts of the house behind the stage-front, for which no attempt at ventilation is ever made, sweeping over the footlights and carrying their gaseous products with them, are even more offensive.

Some persons imagine that because theatres are lofty buildings, therefore they must be airy as well as spacious; but no mistake can be more fatal, for they only form vaster receptacles of foul air and are far less easily emptied of the same, than buildings of more moderate height would be, unless a proper system of ventilation is applied to them. Even when inlets to admit fresh air are provided for

auditoriums of theatres, they are ordinarily upon an altogether insufficient scale, and being situated,—as indeed they should be in ordinary buildings, but not in a theatre,—at a level above the heads of the audience, they fail (in consequence) of producing the expected effect, because there are no exhausting outlets at a lower level to induce a circulation of the fresh air. In the rooms of other buildings the fireplace is the principal outlet for vitiated air, and is at a low level; it therefore drains off the heavy carbonic acid which falls as it cools. But in a theatre there is generally no extracting outlet fixed at so low a level, and therefore the occupants of the pits and stalls are placed as it were in a bath of carbonic acid, which rises as it accumulates, until they are forced to breathe it, to their discomfort and deadly peril.

The foregoing remarks apply principally to the auditoriums of theatres, but the importance of extending a proper system of ventilation to the entire structure must not be overlooked for an instant. The stage, the green-room, the dressing-rooms, the refreshment-rooms, the property-rooms, and all the other parts of a theatre in which the numerous *employés* are engaged, need (though they seldom receive) equal consideration in this respect. These subordinate parts in almost every theatre,—as in Covent Garden, for instance,—are in a far worse condition than those portions that are devoted to the public. The condition of the dressing-rooms, and passages and corridors leading to them, is almost invariably exceptionally frightful, for these parts of the house are numerously occupied, and have numbers of gaslights constantly burning in them, and there are seldom any or but few outlets provided for the vitiated air generated in them, and they have no inlets for the supply of fresh air. Under such circumstances how can actors perform their parts with alacrity? Languor, the precursor of disease, must sap their energy. Yet again, the entrance lobbies, the halls, and corridors should be most plentifully supplied with fresh air, regulated in temperature, whereas, as a rule, these parts of a theatre are absolutely neglected in this respect. Were these filled with an ample supply of warmed or cooled fresh air they would become feeders for the remainder of the building, and the cold draughts now complained of in even the best ventilated theatres, which sweep into the auditorium as soon as any of its doors are opened, would be obviated.

But it may be asked, how can the whole of these multifarious parts of such a building, as a theatre be sufficiently ventilated and warmed or cooled, as occasion may require? My reply is, as before,—By avoiding half-measures only, which alone hitherto seem to have been attempted in this country.

The thorough principle I am laying down is, but the same that is universally, on the whole, successfully adopted in America. It is only in points of detail that it would seem that the methods adopted by our trans-Atlantic cousins need some modification; such, for instance, as taking care that the warmed air is not burned, and by increasing the freshness and volume of the warm-air supply needed in winter, or by the cooled air desirable in summer.

The great essential for theatre ventilation is, that the whole structure, from basement to roof, should be completely filled throughout, by mechanical means, with pure air, regulated in temperature as required. This is what is termed the *plenum* principle of ventilation. At the same time, although it is the inlets that primarily demand attention, secondary mechanical means should also be used for the constant draining off of vitiated air from the several places where it is apt to collect, such as the floors of the pit and stalls, under the galleries, the upper and dress circles, over the footlights, &c. The opposite plan to the above,—that, namely, of relying mainly upon the exhausting appliances, and leaving the fresh air to enter as it can to supply the place of the air that has been extracted,—is fraught with evil, from its liability to produce draughts from the various points whence the semi-vacuum created can succeed in obtaining a supply; such, for instance, as temporarily-opened doors, and even from the chimneys, down which the smoke is often actually drawn by this abnormal demand for air. Indeed, this is one of the most fruitful causes of the smoky chimneys which cowlstaffs supposed to remedy.

The system I have thus recommended, fully carried out, will get over the difficulty of

having to decide whether the inlets should be vertical or oblique, a question that could only arise when they are small and few, and when the air they admit is unregulated in temperature, or whether the breezes needed should be obtained by utilising the mouths of all the Cupids, angels, and gods and goddesses that the fertile invention of the decorator of a theatre may introduce; or whether the cornucopia and such like gands should be made hollow or not. Given power enough, which is easily obtainable, to flood the whole building with air tempered as required, and it will matter less as to the precise distribution of the inlets into the auditorium itself.

There is one thing that will doubtless tend to render this problem of the ventilation of theatres, which has been found so difficult, easier to accomplish than it has been. I mean the introduction of electric lighting instead of that by gas. This has already been done by the enterprising manager of the Savoy Theatre, and later by that of the Prince's Theatre.—I doubt not, to their own material advantage as well as to the comfort of their over-crowded audiences.

We cannot afford, however, to let this present generation pass away stifled and incommode while electricians are perfecting their methods of lighting. Nor is it every theatre that has a spare acre or two, in the middle of London, alongside of it, for the accommodation of a puffing steam-engine to create the light, nor an untenanted Embankment as a convenient neighbour to put up with the noise of one. In the meantime the gas-lights in theatres should, as far as possible, have their products of combustion conveyed outside the building, without being allowed to mingle with and contaminate the atmosphere of the interior. Yet, notwithstanding this serious drawback of the ordinary gas-lighting to contend with, we have scientific resources at command sufficient to enable us to overcome all the difficulties that at present retard the proper development of this essential of civilisation, proper and adequate ventilation.*

THE PROPOSED "CAMPO-SANTO" AT WESTMINSTER ABBEY.

As I have never seen a drawing of the elevation of Sir Gilbert Scott's proposed "Campo-Santo" in connexion with Westminster Abbey, I am unable to form an opinion on its artistic merits; but the plan published in the *Pall Mall Gazette* of the 29th ult. is quite sufficient to enable any one to form a distinct idea of what its merits or faults may be in all essential respects.

In the first place, I have no hesitation in stating my conviction that neither Sir Gilbert Scott nor any architect that has yet lived could render a long unbroken one-storied building, extending in one line for 450 ft., worthy of such a situation. It would form one side of Old Palace-yard, 200 ft. in width, and then face the gardens at the south end of the Parliament Houses, extending 400 ft. to the river's edge. By exaggerating the height, and lavishing ornament on it, and adding towers and pinnacles, a great deal, of course, might be done to remedy these defects, but as it would have to compete with the Houses of Parliament and the Victoria Tower, this could only be effected at an expenditure of money which, I feel sure, would not, and ought not, to be sanctioned for such a purpose.

In addition, however, to the enormous outlay required to make the building worthy of such a situation, the scheme necessitates the removal of all the houses in Abingdon-street as far as Great College-street, which would involve an outlay of money which ought not to be incurred unless no other means can be devised for meeting the difficulty, which, as I hope to be able to show presently, is not the case in this instance.

The most serious objection, however, to the scheme is neither artistic nor financial, though these appear to me insuperable,—but sentimental. It is not, and never can be made, an integral part of the Abbey, nor ever seem to be in direct connexion with it. Burying in a "campo-santo" at Westminster can never, in public estimation, be considered an equivalent to being buried in the Abbey,—at least, not till after a century or two of entombments of illustrious men has sanctified the new burying-place. A cheaper and better expedient would be to construct a covered way from the north transept to a

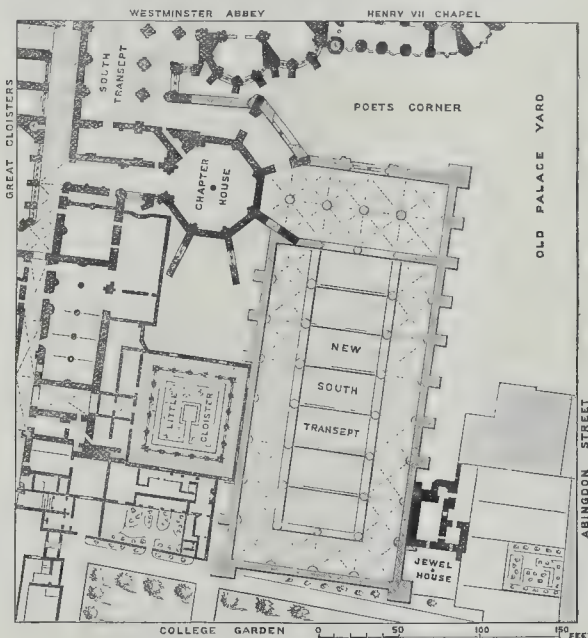
* The remainder, together with a report of the discussion which followed, in our next.

new porch to St. Margaret's Church, and for Parliament to decree that burying in that church was to be considered as equivalent to burying in the Abbey. It is nearer and more accessible than this "campo-santo," and older and every way more appropriate and more closely connected with the Abbey. But would the public ever be brought to take this view of the case, or would it ever be an object of ambition with our great men to be buried in St. Margaret's Church because there is no longer any room for them in the neighbouring Abbey? I think not,—not in our day, at least.

Fortunately, a solution in this case, of all these difficulties,—artistic, financial, and sentimental,—is not far to seek. It would only be necessary to pull down the houses on the west side of Old Palace Yard, and those which encumber the Abbey in Poet's Corner. Besides this, some second-class clerical residences on the site of the old Infirmary and St. Catherine's Chapel must be removed. When this is done a clear space is obtained between the little cloisters of the Abbey and the old Jewel Tower, sufficient for the erection of a building 250 ft. by 100 ft. in width, in immediate contact with the Abbey, and that may be so arranged as practically to form part of it.

The new south transept would, of course, be erected in the same style as the Abbey itself,—it is not an expensive style,—with every detail copied from the parent building. It would, necessarily, be less ambitious and less ornamental. It would be very much lower, and the roof of the central aisle, at least, would be in wood. We can all judge how ornamental that can be made from the neighbouring Hall. If, however, the expense were not a bar to its being done, it would be a great advantage if the side aisles and lower vestibule were vaulted. But, whether this were done or not, it might be made much more essentially a part of the Abbey than Henry VII's Chapel, which, being built in a different style, is felt to be a different building, though in such immediate juxtaposition.

Though it would be very much lower than the Abbey,—its height to the ridge of the roof would be about 100 ft.,—it would be very much more spacious. The width of the nave and transepts of the Abbey is only about 80 ft., while if this building were carried out as shown in the annexed woodcut, it would present a clear space from wall to wall of at least 100 ft. It need hardly be observed that this increased spaciousness combined with diminished height would be a great gain to the effect of any monu-



Sketch Plan of Proposed Addition to Westminster Abbey.

The area of this building would be considerably in excess of that proposed by Sir Gilbert Scott, besides being in a much more compact and manageable form. It would also range perfectly parallel with the Houses of Parliament, and be situated well within the line of the east end of Henry VII's Chapel. It would also group most pleasingly with the Chapter-house and the Abbey itself. But its greatest merit, it seems to me, is that it can be made to appear a part of the Abbey itself.

The principal entrance to it would be by a doorway situated at the upper end of "Poet's Corner," between two of the battresses of the Chapter-house, but placed diagonally, so as to belong, in appearance, to both or either the Abbey or the new building.

When a visitor enters by it, if he turns to the right he is in the "Poet's Corner" in the south transept of the Abbey. If he turns to the left at even a less distance he is in the new building. Practically, though not mathematically, it is an extension of the south transept, and visitors to the building would pass from one to the other without perceiving the difference, except, of course, in grandeur and beauty of design, the one would remain, and be called the old, the other the new south transept, but both parts of the same Abbey are equally sacred and entitled to honour.

ments that might be placed within it, and to the display of sculpture on the scale that is now fashionable.

It is, of course, extremely difficult even to make a plausible guess at what a building will cost before detailed drawings are prepared; but we are probably justified in assuming that 100,000l. would suffice to complete the proposed building, even if carried out in the most lavish manner. If this be so, it is evident that one-fifth of that sum might be saved by reducing the width to 80 ft., the same as the Abbey. 20,000l., or even 30,000l., beyond this might be saved by omitting all vaulting, and applying a wooden roof throughout, and by various economies, which, however, I should be very sorry to see practised. If carried out as it might be, it affords a glorious opportunity of adding worthily to one of our noblest buildings, and, if undertaken, it ought not to be in any niggard spirit, but with the lofty aspirations of the architects of former days, backed by the enormously increased wealth accumulated in the nineteenth century. JAS. FERGUSON.

20, Langham-place, Feb. 12, 1884.

A Statue of Apollo, 1 mètre 80 centimètres in height, is reported to have been discovered outside the Porta San Lorenzo.

A NEW PROCESS OF MURAL PAINTING.

An interesting paper on "Mineral Painting," a new process which, it is claimed, will produce permanent and indestructible mural paintings, &c., was read before the Society of Arts, on Wednesday evening last by the Rev. J. A. Rivington. The process is the invention of Herr Adolph Keim, chemist, Munich. The paper, as read by Mr. Rivington, would occupy more space than we can spare, but we are enabled to give the following particulars of the process:—

Mr. Keim's process of mineral painting, the result of nearly twelve years most incessant and arduous labour, is based on the stereochromy of Schlotthauer & Fuchs, but differs from that in such important particulars as to constitute practically an entirely new process.

I. *As to the Preparation of the Painting Surface.*—The preparation of the surface to be painted on is a great feature in this process. Every care is taken, in the first place, that the wall to be treated contains no damp or decaying stones or bricks, and the latter must have been sufficiently baked. If the wall be already covered with stucco or mortar this will serve as the first ground, if in a thoroughly dry and sound condition, and it will then be sufficient to clean and level it before applying the second or painting ground; if not, the stucco must be cleared off, the bricks laid bare, and the mortar between the bricks picked out to a depth of about $\frac{1}{2}$ in. This more thorough preparation is always preferable in a work of greater importance, or when special pains are advisable to secure durability, as, for instance, when undertaking the exterior decoration of a building. Upon this surface a thin squirting is cast, composed of the following mortar:—Coarse quartz sand, infusorial earth, and powdered marble, mixed in certain proportions. Of this mixture four parts are taken to one part of quick-lime, slaked with distilled water. Upon this squirting cast follows mortar of ordinary consistency, composed of the same ingredients, to fill up all inequalities, and produce a smooth surface; and upon this, again, the second or painting ground is applied. The painting ground is composed of the finest white quartz sand, marble sand, artificially prepared and free from dust, marble meal, and calcined fossil meal (infusorial earth). The sand composed of these materials, carefully mixed in proper proportions, is mixed with quick-lime, slaked with two parts of distilled water in the proportion of eight parts sand to one part slaked lime. This mortar is applied to the wall as thin as possible, not exceeding $\frac{1}{4}$ in. to $\frac{1}{2}$ in. in depth. When perfectly dry, down to the stone or brick of the wall, it is treated with a solution of hydrofluosilicic acid, to remove the thin crust of crystalline carbonate of lime which has formed on the surface, and thus closed the pores. It is then soaked with potash water-glass (silicate of potassium), and, when dry, the ground will be found hard, but perfectly absorbent, and ready for painting. This ground can be prepared in various degrees of coarseness of grain to suit the artist's requirements. A perfectly smooth and polished surface presents, however, greater difficulties in the subsequent process of fixation, from its absorbent qualities being necessarily less. The ground can be prepared in any tint or colour, and can be applied to any suitable substance, such as stone, tile, slate, wire gauze, canvas, &c. If applied to canvas, it can in this form be fixed to wood panels, millboard, ceilings, &c., and admits of being rolled up with perfect safety.

II. *As to the Colours.*—Certain pigments only are admissible for this process, in order to ensure permanence, and these must be absolutely free from any adulteration. All those found available for stereochromy can be employed. These are, for the most part, composed of natural earths, or metals, since experience has proved that the most permanent colours are those derived from such sources. In their preparation regard has been had to the well-known law in optics which teaches that colour does not lie in the substance which appears as colour, but in the rays of light which are divided, reflected, or absorbed by the substance in such a manner as to produce the effect of colour upon the eye. Substances, therefore, which readily undergo change, whether by reason of their affinity to other substances, or by the action of light itself, which often causes molecular change, must lose their original colour, since under their altered conditions they absorb or reflect the rays of light in a different manner. It is, there-

fore, of primary importance that the pigments should remain chemically unaffected by the substance of the painting ground on which they are laid, as well as of the material employed for fixing them. To meet this end, the colours in this process are treated beforehand with alkaline solutions (of potash or ammonia) to anticipate any change of hue which might result from the use of the alkaline liquids which form the fixative, and are further prepared with certain admixtures, as the hydrates of alumina, magnesia, or silica, oxide of zinc, carbonate of baryta, felspar, powdered glass, &c., as required by their peculiar properties. The colours found available present a very complete scale. They are thirty-eight in number, and there are several colours which could be added if required. They consist, speaking in general terms, of four varieties of white, six of ochre, two of sienna, ten of red, two of brown amber, two of Naples yellow, two of ultramarine, five of green, three of black, and cobalt blue.

III. *As to the Fixing.*—The fixing of the painting is effected by means of a hot solution of potash water-glass, treated with carbonate of ammonia, thrown against the surface in the form of a fine spray, by means of a specially constructed machine. Several applications, according to the requirements of the painting, are necessary, till the ground will no longer absorb the preparation. The fixative sinks into the porous ground, which has already absorbed the colours applied to it, and unites with the colours and ground in one homogeneous mass of artificial stone, completely enclosing the colour in a hard casing of silicate of potassium soluble only by hydrofluoric acid. The hardening of mortar, as is well known, is due to the action of the carbonic acid in the atmosphere upon the slaked lime (hydrate of lime), converting its particles, which enclose the grains of sand, into carbonate of lime, and in the process cementing them into a cohesive mass, closely resembling marble, which is itself a carbonate of lime. The action of the water-glass upon the mortar in this process, when applied before and after the painting, is to form in addition a silicate of calcium, increasing beyond comparison the hardness and durability of the whole, silicate of calcium again forming one of the constituent parts of some of the hardest marbles. This durability has been proved by an experience of nearly forty years. The paintings by the stereochromy process, while they have, for the most part, lost the coating of paint or the colour, have, save in those cases where the preparation has been carelessly effected, retained the painting ground in perfect and sound preservation. In Mr. Keim's process, moreover, an additional durability is ensured by the peculiar composition of the sand employed for the mortar. Marble sand, one of the ingredients (carbonate of lime in crystalline form), has been proved by experience to add very greatly to its firmness, possessing many advantages over quartz sand, such as greater porosity for the absorption of the colours, &c. Again, the infusorial earth mixed with it (a form of silica) has a double effect in consolidating the mass. 1. It acts mechanically, cementing and binding together, with the lime, the coarser particles. 2. It forms, to some extent, with the lime a silicate of calcium, such as afterwards results from the addition of the water-glass. The presence of this silicate within the mortar adds very greatly to its hardness and power of resistance to chemical or mechanical influences.

IV. *As to the Painting.* The process above described, so far from resembling other methods of fresco-painting in the technical difficulties they present to the artist, is far easier and pleasanter to work in than even ordinary oil or water-colour. Every variety of treatment is possible, and the method presents equal facility for transparent glazing, or for painting in body colour. Distilled water is the only medium used in painting, and the colours go a long way, as they can be used very thin; in fact, the thinner the coat of painting the better it will fix, and there need be no waste of paint at the end of the day's work, as in oils. If the remainder of the colours on the palette be kept moist with distilled water they will be perfectly available for the next occasion. Retouching and correction are effected with the greatest ease, nor do the most delicate shades of light colours, when laid over dark tones, in the least degree alter their tone or darken over them, as in oils. In these respects, therefore, the system presents

decided advantages, both in cleanliness, simplicity, and economy.

The finished painting will admit of sulphuric, acetic, or any other acid save hydrofluoric, being poured on it, even in an undiluted form, with absolute impunity. Caustic potash also has no injurious effect upon it. It may be suffered to lie in cold or hot water, and may be scrubbed with a brush and soap. If scratched with the finger-nail, the only result will be damage to the nail. It will therefore safely defy any friction from passers by, &c., where applied to the wall of a building. If damaged by a violent blow from a hard instrument it can be repaired and retouched with the greatest ease and simplicity. The carbonic acid of the atmosphere is distinctly beneficial to it, as imparting to it, by degrees, the consistency of actual marble, when absorbed by the lime in its composition. The moisture of the atmosphere, even in the form of heavy rain, is also an advantage in dissolving away the free carbonate of potash formed by the chemical action of the water-glass. For interior decorations it is in any case an advantage, though not a necessity, to wash this off with distilled or filtered rain-water. In the case of exteriors this may be left to the natural action of the elements.

If the foregoing statements be correct it becomes obvious that paintings executed by this process admit of being cleaned, when necessary, with water, soap, or caustic potash, without incurring the slightest injury to the most delicate colours,—a fact invaluable in a climate such as that of London.

Although the process has been devised primarily to meet the requirements of mural painting, it is capable of application to other purposes. Owing to its durable qualities and the readiness with which it can be cleaned, it is well adapted for scene-painting, especially as it is unflammable, owing to the presence of the silicate. For ordinary house-painting it is claimed that it would last as long as the building itself, only needing to be scrubbed down from time to time. Its use for this purpose would be additionally valuable owing to the fact that it is damp-proof.

A PRACTICAL OUTCOME AS TO ELECTRIC LIGHTING.

THE brilliant expectations that were, some short time back, entertained as to the electric light have been succeeded by almost a panic. The second movement is as unreasonable as was the first. The original fear that the property of gasworks would be depreciated, if not destroyed, by the new invention is now entirely dissipated. It is evident that there is room for both illuminants; and that each has its appropriate sphere of utility. What the electric light enterprises are now suffering from is the undue expectations with which they were started, and the heavy loads with which the various associations were handicapped in the way of payment for patent right and promoters' charges. As the market rights itself in this respect, we may expect to see electric companies taking a steady, if a modest, position among the industrial associations of the day.

The public are indebted to Mr. Octavius Cooke, M.P., for detailed information as to the cost of a special form of electric lighting, which is a valuable contribution to our exact knowledge of the subject. This information has the special value of being supplied by a gentleman who is neither directly nor indirectly interested in or connected with any electric light company or electrical system whatever, nor does he hold a single gas share. Freedom from any bias, whether conscious or unconscious, is a characteristic as valuable as it is unusual. The experience detailed is that of a year of working; and it does not appear as if any of those considerations which sometimes affect the results of a first year's experience, so as to make it exhibit unduly favourable results, had been overlooked in the present instance.

We must not occupy our space with reproducing the details given in Mr. Cooke's letter of the 24th ultimo to the *Times*. To abstract them would be of very imperfect utility, as there is nothing set down which is not of importance to any one who intends to make practical use of the experience. But the general outcome is this. Berechurch Hall, Mr. Cooke's residence, has been illuminated by 200 Swan incandescent lamps, of a nominal power of 18 candles each, which have turned out to be of a photometric

value of 20 candles each. The cost of the first instalment has been 1,490l. 8s., or 7-45l. per lamp, against an estimated cost of 1,333l. 18s. for gas, presumably of the lower photometric value. A 12-h.p. steam engine and four Burgin dynamos are provided in this sum, and the annual cost for 1883, allowing 10 per cent. depreciation on cost of machinery and 5 per cent. on conductors, has been 359l. 18s. 9d. The working hours, which were estimated at 1,150 in the year, have been actually 1,823; the result being a little less than a farthing per hour for each 20-candle power lamp.

Mr. Coope does not give the corresponding cost of gas; but he states that of small coal at 13s. 6d. and of coke at 18s. per ton,—Berechurch Hall, being about four miles from Colchester station. He also obtains duty from his engine, in the way of pumping, which he estimates to be worth 60l. per year. The softness and purity of the light, the absence of heat, and the avoidance of that contamination of the atmosphere which makes it impossible to keep plants in a room lighted by gas, are spoken of with great satisfaction.

It will be observed that the circumstances of the case are special. An isolated house, requiring the large number of 200 lamps, is a unit of sufficient size to pay for the constant services of an engine-driver and a lad. There are no conflicting requirements. There is, probably, a great uniformity in the demand for light. It would be misleading to expect the same return in cases where these features were absent. We may add that the fuel cost 25 per cent. of the total cost. If equal quantities of coke and small coal were burned, the average cost per ton would have been 15-9. We give this calculation as affording a guide as to the allowance to be made for a higher or lower price of coal in any otherwise corresponding circumstances.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE visiting season was opened on Saturday last by an excursion to the Canongate, in which about seventy members took part, under the guidance of Mr. John McLachlan, past-president. The excursionists were received in the Hall of the Canongate Tolbooth, by Mr. Skinner, Town Clerk, and by Mr. Robert Morham, City Superintendent. The latter gentleman read a few notes, in the course of which he said that the building was one of the best examples of the pure Scottish Baronial style, and was erected during the reign of James VI. in 1591, as a species of Town House or seat for the local Government of the Burgh of Canongate. The various alterations which the structure had undergone were detailed, and its present uses as a Register Office and Police Station were explained. After a close inspection of the interior and exterior, Professor Baldwin Brown proposed a vote of thanks to Mr. Morham for his party. The party thereafter proceeded to Moray House, where Mr. Maurice Paterson, the rector, met them, and exhibited prints of the house as originally executed and laid out. Mr. Andrew Kerr, late of Her Majesty's Office of Works, made a few remarks, in which he drew attention to the striking contrast between this building, erected in 1628 by Mary, Countess of Home, and the one just left. Seeing that the one building was erected as a prison and the other as a first-class residence, he made no comparison, but drew attention to the harmonious blending of Baronial, Gothic, and Italian, the entire absence of defensive arrangements, and the dissimilarity between it and other buildings erected in Edinburgh about the same period, which he explained by the fact of its founder being an Englishwoman in possession of considerable wealth, which enabled her to provide a comfortable residence in accordance with the ideas of the South. The interior is plain, except in the two principal rooms, where the ceilings are domed and panelled, the latter of which are filled in with beautifully-designed plaster ornament, significant of much artistic power judiciously employed. It appears that the grounds, as originally laid out, were terraced, and contained a pleasure-house, in which, it is said, the Treaty of Union was commenced to be signed. After detailing the illustrious tenants of the house, the speaker concluded by pointing out that in more modern times the building was used as the Hall of the British Linen Banking Company, later as its counting-house, still later

as a private residence, and it is now used as the Training School of the Free Church of Scotland. Mr. T. Croall having proposed a vote of thanks, a departure was made for Milton House, and subsequently to Queensberry House, regarding which Mr. John McLachlan read some notes, in which he enumerated the various occupants of the pile, and explained the several alterations which had been made on the building. After examining a few of the surrounding closes in a cursory manner, the proceedings terminated by an inspection of the curious house or lodge situated at the west corner of Holyrood Palace, known as Queen Mary's Bath, the history of which was explained by Mr. Kerr.

ARCHITECTURAL ASSOCIATION.

VISIT TO MANSIONS IN HARRINGTON GARDENS, S.W.

THE second Saturday afternoon visit by the members of this Association to works in progress took place on the 9th inst. to some new mansions in Harrington-gardens, South Kensington. The mansions are situated in a good, broad thoroughfare, but the "gardens," properly so-called, are to the rear, the usual divisions, or "garden walls," being dispensed with. The houses inspected were a pair of mansions in course of completion from designs by Messrs. Ernest George & Peto, architects, and which present a very quaint appearance, the outline being bold and picturesque, having two large gables, one being relieved by corbie steps. Unfortunately, no one was in attendance to meet the members, excepting a watchman, who could give no information, so they had to wander through the various rooms and apartments, and find out their uses as best they could. A foreman with a set of plans was much needed; if one had been provided, as on the occasion of the former visits to the City, it would have saved much trouble and questioning on the part of the members. The houses visited are being executed by Messrs. Peto Brothers, builders, of London. Two adjoining houses, erected from designs by the same architects, and occupied by Mr. W. S. Gilbert and the Hon. H. Coke, were built by Messrs. Stephens & Bastow, of Bristol.

THE WATER SUPPLY OF PARIS.

WE take the following statistics of the water supply of Paris from the *Journal des Débats*. The author of the article from which we quote is of opinion that the quantity of the daily supply for domestic use is inadequate, whilst an excessive quantity is wasted in watering streets, and for other public purposes. In 1877 the total daily supply per head was 185 litres (40 gallons); at present it is only 164 litres (36 gallons), and it will rise again to 180 litres (39 gallons) per head only after the completion of the new works now in course of erection, for a present population of 2,230,908 inhabitants. The following is the daily withdrawal of water from the existing sources of supply:—

	Cubic metres.
Vanne	100,000
Dhuis	21,000
Arnell	2,000
Oureq	125,000
Seine	60,000
Marne	54,000
Artesian well	7,000
	369,000
	(81,215,424 gallons.)

Of this quantity, at least 75 per cent. is used for public purposes, and only 25 per cent. is supplied to private houses, in the following proportions, approximately:—

	Cubic metres.
For flushing sewers	139,000
For watering streets and squares	65,000
For the supply of private houses	95,000
" " public works	23,000
" " drinking-fountains	9,000
Waste	38,000
	369,000

From this statement it follows that the quantity used for public purposes is 120 litres (26 gallons), and for private consumption only 42 litres (2 gallons), per day per head. Moreover, it is stated that the best water is not exclusively supplied to the private consumer. At least 125,000 cubic metres (27,512,000 gallons) of excellent drinking-water, or 55 litres (12 gallons) per head, are supplied daily, but mostly used for public purposes, whilst the great majority of the inhabitants of Paris are furnished with the

more or less polluted water of the Ourcq Canal or through the pumping station at Chaillot with Seine water.

EGYPTIAN ARCHITECTURE.

[WITH ILLUSTRATIONS.]

THIS was the subject of a lecture given by Mr. Reginald Stuart Poole, LL.D., on the evening of the 7th inst., at the Royal Academy. Egyptian architecture, he observed, is Egyptian art, for sculpture and painting are, as a rule, combined with architecture and subservient to it, there being some rare exceptions in the case of sculpture only. He went on to speak of the physical and moral causes of Egyptian architecture, namely, the suggestions offered by the colours and forms of nature, the materials at hand, and the religious ideas which the ancient artists strove to express. The colour of Egypt is full of strong contrasts, harmonised by the most vivid sunshine, a sunshine which softens whatever falls under its light, and reflects on objects in shadow the most delicate varieties of colour. (This truth was illustrated by some beautiful Egyptian studies lent to Mr. Poole by Sir Frederick Leighton.) The effect of this luminosity on the minds of early artists would be to induce them to have no fear of strong contrasts of colour for external decoration; and for internal decoration, where the heat of the climate would render comparative obscurity necessary, the same system would still better apply. While the colouring of Egypt has a powerful charm, the forms of the landscape are extremely simple. The Nile has cut a trench through the tableland of the desert, a trench bounded by clifflike mountains at a distance from the river on both sides rarely exceeding eight miles, and sometimes at the water edge. The long lines of the desert tableland occasionally ending in steep sloping sides (as seen in one of Sir Frederick's studies), and with their cliffs slanting to the valley at the same angle, are suggestive at once of the long horizontal roofs of the temples, and the broad portals with sloping sides which face them; while the colonnades of palms with tufted heads, seen in the background with a mountain behind them, are naturally suggestive of the porticos of the temples. The dryness of the climate and the abundance of building material would encourage a monumental instinct. Limestone, sandstone, and red granite can be quarried from the mountains close to the Nile in Upper Egypt, and the blocks can be transported on the waterway throughout the valley of Upper Egypt, and by many streams to any part of the triangular plain of Lower Egypt. The beautiful Nile deposit makes excellent bricks, which, in most parts of the country, need only to be sundried. Timber is extremely scarce, but must, in very early times, have been far more common, for the earliest stonework is imitation of woodwork, and in woodwork the Egyptian native craftsmen have always excelled. We should therefore expect an abundant use of stone and brick, and a far smaller use of wood in the Egyptian buildings.

The Egyptians, who 6,000 years ago reached what some think the highest point of their civilisation, used the materials and suggestions of nature according to their instincts, directed by a religious motive. In studying their architecture, it is impossible to pass by their social qualities. They had not only a keen love of nature and open-air life, the sports of the desert, the marshes, and the water, but, yet more, a love of country, and delight in home. Egyptian domestic life was without the constraints which have almost everywhere else retarded Oriental civilisation. Women enjoyed absolute freedom, legally as well as socially; and all those to us novel rights and privileges which have been viewed with alarm and jealousy were fully enjoyed by establishing a balance of power, and may be held to have preserved Egyptian civilisation for as many centuries as other civilisations can count decades. These conditions had something to do with the monumental instinct; for, as we shall see, the first idea of historical record was the perpetuity of the house, and the centre of religious service was always the tomb. But it was the belief of the Egyptians which took hold of the family instinct. Their religion in its higher aspect was simply sun-worship. One form of the solar myth they applied to life. The god Osiris, who represents at once the sun of the night and the Nile, or light and fertility, wages

a long conflict with his brother Typhon,—darkness, the desert, and the storm. At length he is vanquished by his adversary, and disappears in the west, mourned by his sisters Isis, the dawn, and Nephthys, the after-glow. But his death is not annihilation. He reappears as his child, the young Horus, seated upon the lotus, which still on the canals of Lower Egypt opens its blue petals to the rising sun. The conflict with darkness is resumed; and the reign of light is established. This is a type of the picture of every day, and the story of every year. It is equally a type of man's existence, its early brightness, the unequal struggle with evil, seeming defeat, but final victory,—or their spiritual aspects,—life, death, and resurrection. The Egyptians believed that Osiris became above all things ruler of the shades, and that at his burial-place, Abydos, the souls of men passed in the wake of his boat through an opening in the western mountain to the hidden land, God's Under World; that there they took the form and name of Osiris, their judge, and were by him rewarded and punished according to their deeds done on earth (see illustration). Thence the good, after a long probation and purification, returned to the source of light, and the wicked, after terrible punishment, disappeared in annihilation. While the Egyptians held this firm belief in the life of the soul after death, they retained the older conception that the tomb was the house in which the dead man's shade still continued his life on earth, surrounded by the food and drink, clothes and furniture, of his earthly house, or, at least, by their representations. But it must be observed that the shade is never confused with the soul, any more than the ghost is in modern notions. The tomb thus became what the Egyptians called "the Eternal House," while the home on earth was merely a hostelry; so the necessity of the case made the tomb a type of immortality. In order to ensure its permanence, the body of the inhabitant was carefully preserved as a mummy by a process naturally suggested by the dryness of the climate; while the estates were rented for the annual offerings made at certain seasons to secure the repose of the soul. Thus it was the interest of the family to preserve the body as title-deeds, the interest of the priests, who benefited by the offerings, to keep the estates in the family.

The origin of the tomb is clearly to be traced to the earliest house. The external and internal decorations are traceable to the wood-panelling, and the wooden doors and windows of the type. One of the oldest tombs is actually wainscoted with wooden carvings. But the architectural forms are dependent on the principle of permanence to which stone naturally lent itself. The external shape of the oldest tomb is an oblong platform, with slightly sloping sides, formed by receding stones, not cut; so that had it not been flat-topped it would have had two gables (see Example D on illustration). The dimensions vary from a base of 160 ft. by about half that size, to one fifth and fourth of these measures, with a height of about 30 ft. to 13 ft. In the entrance, and also the interior, columns were sparingly used: they were always absolutely square, without base or capital. The tomb had three parts,—the chapel, the secret chamber, and the sepulchral chamber (Examples A, B, C). The entrance was usually on the east side. If on the north it was within a portico, supported by two columns (see Examples D). It was almost always without a door, that all might come and go without hindrance. It led to the chapel, of which the only necessary adornment was the funeral tablet, praying for the performance of the due rites for the passage of the soul to the Under World, "the ancient, the vast, the perfect"; and for the performance of the offerings in future times. In later days those who passed by, whether men or women, are begged, as "you love life and hate death," to repeat the last portion of the prayer. Also, later, the sepulchral inscription was sometimes enlarged into a memoir of the deceased, his services to the king, and his good deeds to his people, how he relieved the fatherless and the widow, fed the hungry and clothed the naked, and made no difference between the small and the great. The walls are usually covered with painted sculptures, in a series of parallel friezes. Here the three-fold purpose of the inscription is maintained. They represent the labourers, herdsmen, sportsmen, fishermen, and craftsmen, all working for the great end and purpose of the tomb, the preparation of the funeral

feast, or the furniture of the eternal abode. The only actual allusion to the funeral itself, or perhaps to the future life, is in the representation of great boats, in which the deceased, as a living person, makes his last journey. The estates personified bring their offerings, each being rated for a particular product,—wine, milk, &c. A funeral procession of a later period shows the extraordinary completeness of the furniture of the tomb and the splendour of the pageant. The tone and character of the sculptures is extremely conventional, without perspective, without relative proportion, dignity being conveyed by size. The human figure is absolutely conventional; the animals, however, are better portrayed. The colouring is very primitive,—red, blue, yellow, green, black, and white, with brown for animals, being alone used, and the ground left white. It is, of course, impossible to speak with any sort of enthusiasm of this very simple treatment of colour, which we do not find modified in later times except by the use of delicate neutral grounds, and, apparently, at a very late period, by lowering the tone. It must be recollected that we have reason to think that the Egyptian colours are the best representations they could produce of precious substances, certainly gold and lapis lazuli, probably silver, ivory, and ebony, and also red and green jasper. If we translate the coloured patterns into these materials we shall modify our opinion of Egyptian taste. The ceilings are painted with graceful designs, usually geometrical. The same is the case with the panelling of the doors and tablets.

By the side of the chapel is a hidden chamber in the solid masonry, the corridor communicating with the chapel by air-holes, and similarly ventilated outside (see Example C). In this place were several statues of the deceased, that his shade might choose the one he liked best, or that one of them might survive disaster. In these the shade resided. The incense, or smell of the offerings, passed through the air-holes into his secret chamber. In the tomb of Ti, at Sakkara, we see representations of incense being offered by figures carved at the entrances to the air-holes. The secreted figures afford the best examples of Egyptian art. They, and they alone, are unquestionable portraits, showing a promise which was never fulfilled; for, as the belief in the shade disappeared, and his secret chamber was abandoned, his statue being placed as an architectural adornment to the chapel, the motive for portraiture absolutely perished, and with it the great hope and promise of excellence in Egyptian sculpture.

The third portion of the tomb, the sepulchral chamber, is wholly disconnected from the rest. It is approached by a pit, of which the mouth is in the roof of the tomb, and which leads directly downwards through the solid masonry into the rock beneath, where, in the level below the chapel it enters a horizontal passage leading to the sepulchral chamber, which is also excavated in the rock (see Examples A, B). This chamber is plain, or slightly decorated with inscriptions from a funeral ritual. In the centre stood the mummy, in its triple case, the two wooden coffins and the outer sarcophagus of stone. Some religious symbols, food, and drink, were placed here; then the passage was closed, and the mummy-pit filled with stones and sand to the mouth. Notwithstanding all these precautions, no tomb of the hundreds explored in Memphis has been found intact. The excavated tomb differs only from the built one by being solidly cut in the rock, the mummy-pit probably always opening from the chamber accessible to visitors.

These are the tombs of the subjects. The royal tombs of the same age are universally pyramids. In the case of pyramids the chapel was a separate building in front of the entrance. The pyramid itself was merely a mass of masonry containing the mummy-pit and the sepulchral chamber. From the form of the structure the pit was a sloping passage, ordinarily terminating in a horizontal one. Artistically the pyramids have an inferior interest. Their prodigious size, the vast labour employed in their construction, and their dignity, give them a charm with which their form could not have invested them. Their chief interest lies in the mechanical skill necessary to the removal of vast blocks of stone, and the construction of buildings of such prodigious size. We must remember, also, the extraordinary labour, probably that of an army of workmen, employed for some of these buildings, intended to be

the sepulchres of single kings. They have been regarded by some as monuments of regal vanity; but if we look upon them as endeavours to express in a material form the idea of immortality, we shall feel that this enormous expenditure of time and labour for the embodiment of a leading article of belief has in it something worthy of admiration.

Without passing into the development of the tomb, which properly belongs to the subject of the next lecture, Mr. Poole observed that the brick pyramids of the great cemetery of Abydos of the next period of Egyptian history form a distinct link between the private tombs of earlier times and the stone pyramids. These little brick pyramids contain a vault above which there is a honeycomb-shaped vacant space, to economise the material. In some cases they have an external chapel in front attached to the structure (see Example E); in others the sepulchral services were performed in the open air within the court surrounding the building. So far the intention of Egyptian monuments, as we know them, is purely religious; in the next period historical purpose rules, to be afterwards supplanted by the religious.

The illustrations have been most carefully prepared in co-operation with Mr. Poole.

DESIGN FOR BELFAST FREE LIBRARY.

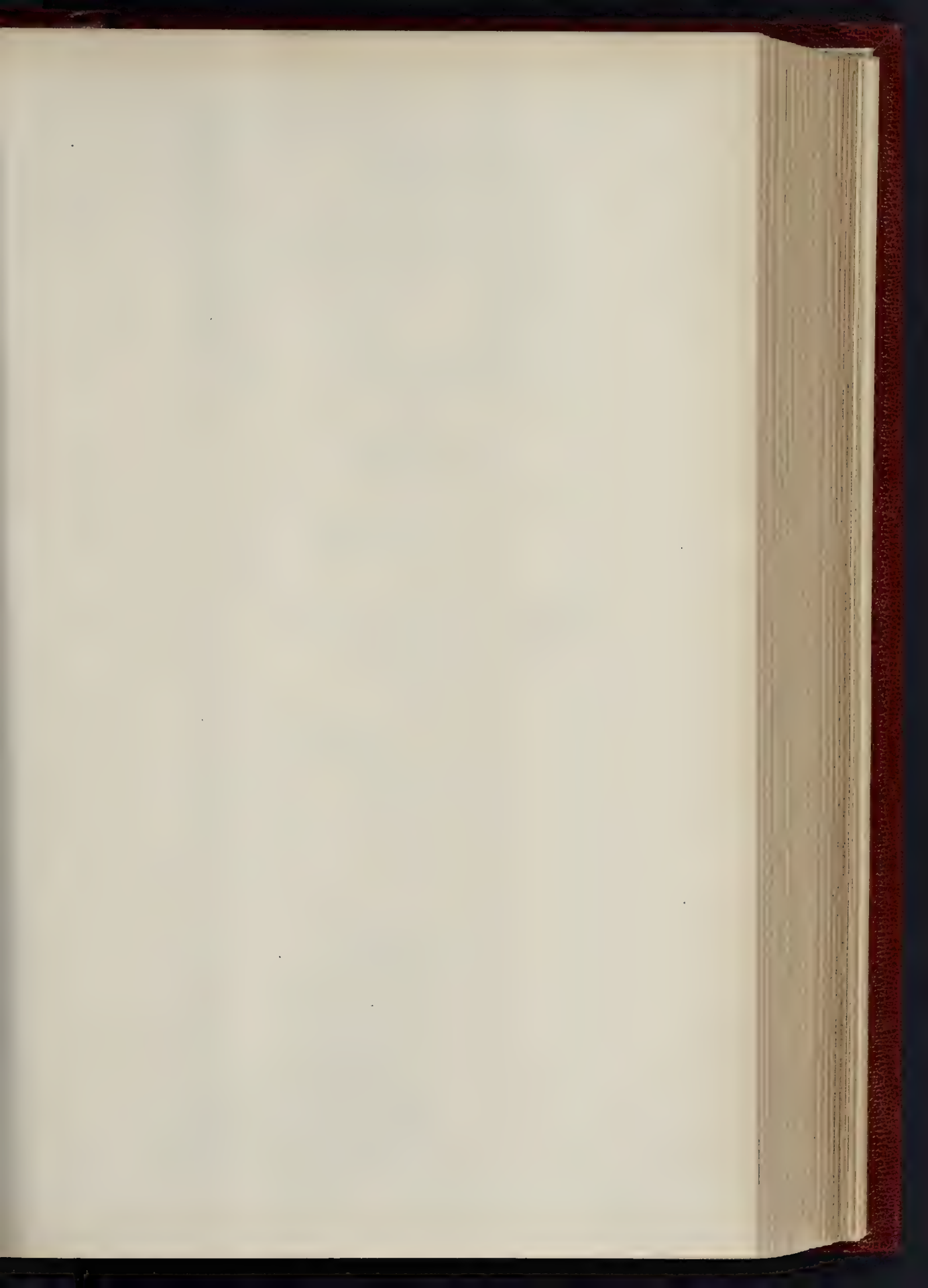
THE design which we illustrate this week was submitted by Mr. T. N. Deane in the competition in which Mr. Lynn's design was selected. It is one of the duties,—and privileges, we may add,—of an architectural journal to give some further publicity to designs of real merit which have failed to gain acceptance in competition, and no one will question that Mr. Deane's design is worthy of being known by more than the few persons who may have seen the collected designs exhibited. It is a very favourable example of the union of Gothic and Renaissance elements in design.

"By no quite lawful marriage of the arts,"

(as Byron puts it), of which we see so much at present. The rich treatment of the centre portion in the principal elevation is very effective, and the arrangement of the windows is happily varied and expressive of the arrangement of the interior planning.

The Health and Sanitary Condition of the City of Coventry.—Judging from the annual report of the Coventry Medical Officer of Health (Dr. Fenton), which was presented to the City Council on Tuesday last, the 12th inst., it is not always a bad thing to be "sent to Coventry." The report shows that the past year has been an exceedingly healthful one for the inhabitants of the ancient city,—the number of deaths (741), from out of a population now estimated to be 45,000, as well as the death-rate (17), being far less than during any other year of which the medical officer has any record. The year has been characterised by an almost entire immunity from zymotic disease in a serious or fatal form, no deaths having occurred from either diphtheria, fever, or small pox. Coventry is, however, not without its unhealthy districts, where the houses, some of them of the oldest and most unwholesome description, are quite unfit for habitation, being built in courts and yards along the line of the streets so closely as to entirely prevent the proper circulation of air around them. Considerable improvement has in recent years been made in various parts of the city, and no doubt a considerable share of the mitigation in mortality now experienced arises from this cause. The work done by the Inspector of Nuisances, Mr. Booker, appears to be of a very satisfactory character,—a large number of nuisances being abated, sanitary works of a structural and permanent kind executed, and the sanitary by-laws and regulations duly enforced. It says much for the tact of the inspector that he rarely has to resort to the magistrates for assistance in securing the abatement of nuisances.

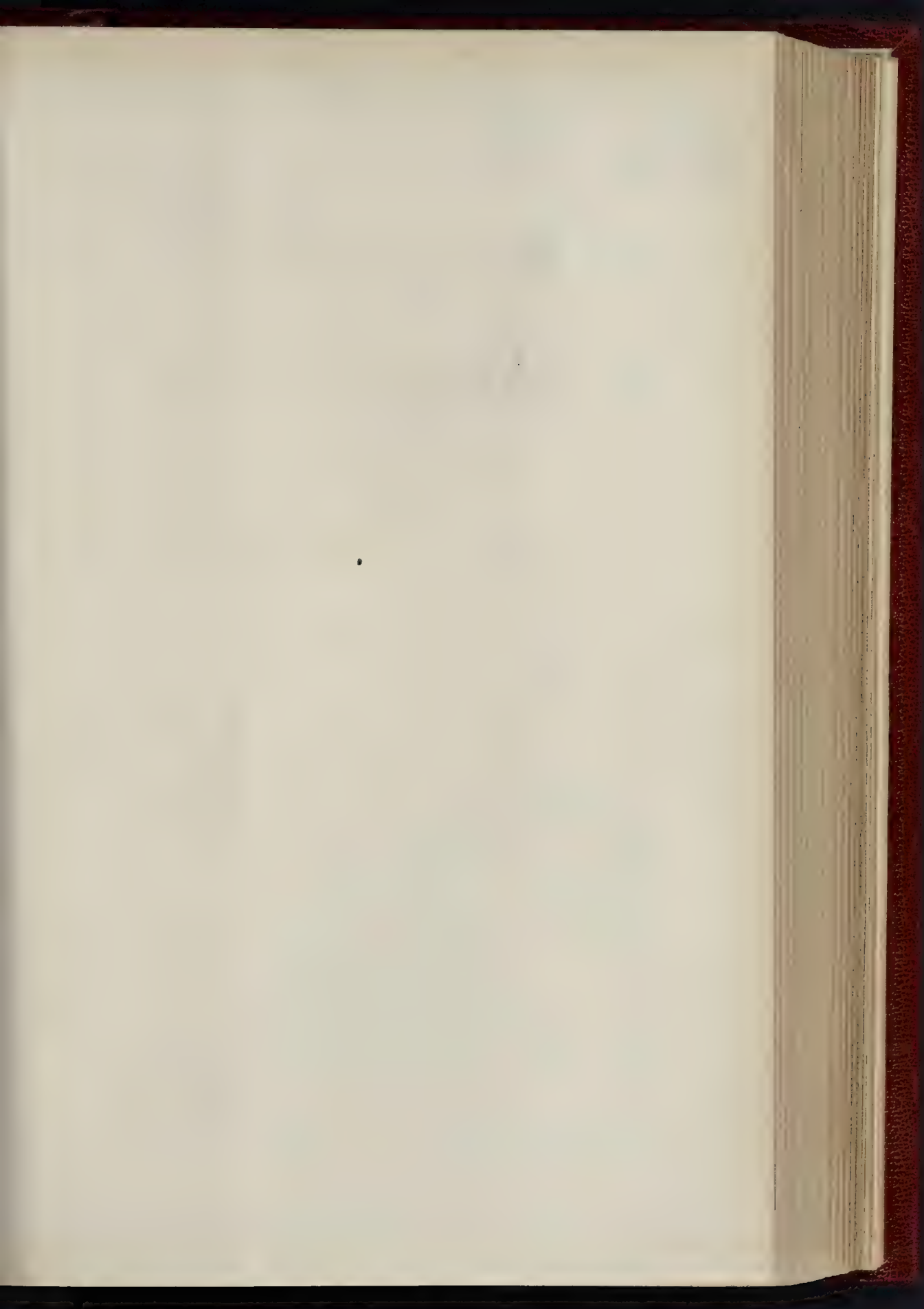
Exhibition of Architectural Drawings at Berlin.—The Administration of the Royal Berlin Museum has been exhibiting a number of curious and interesting drawings, embracing both architectural and decorative subjects. Amongst the principal objects in this collection are the following:—A rich ceiling, drawn by Daniel Narot (1700); as well as ceilings by Egidius Schor, and an arm-chair of Peter Flötner (1540).

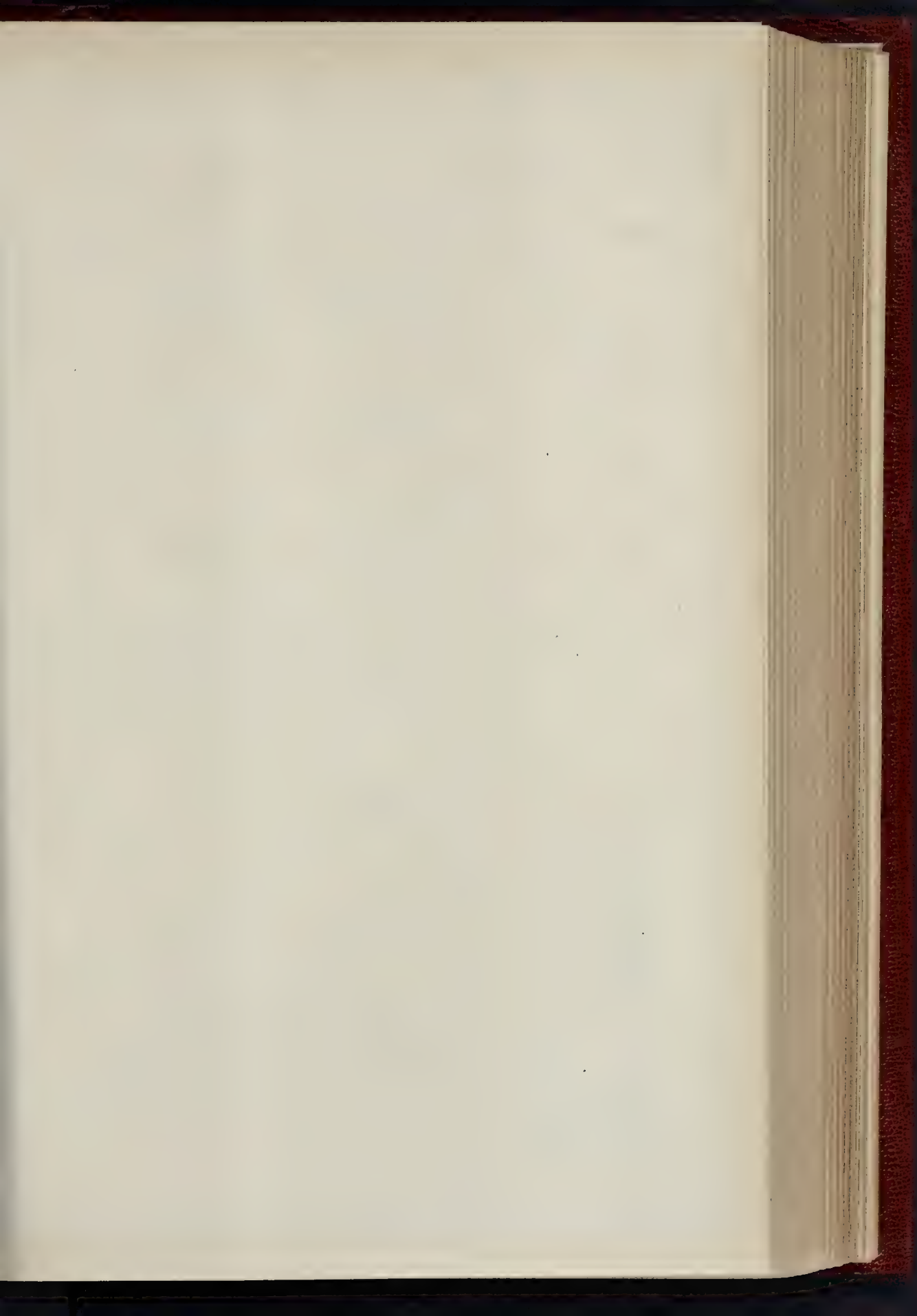


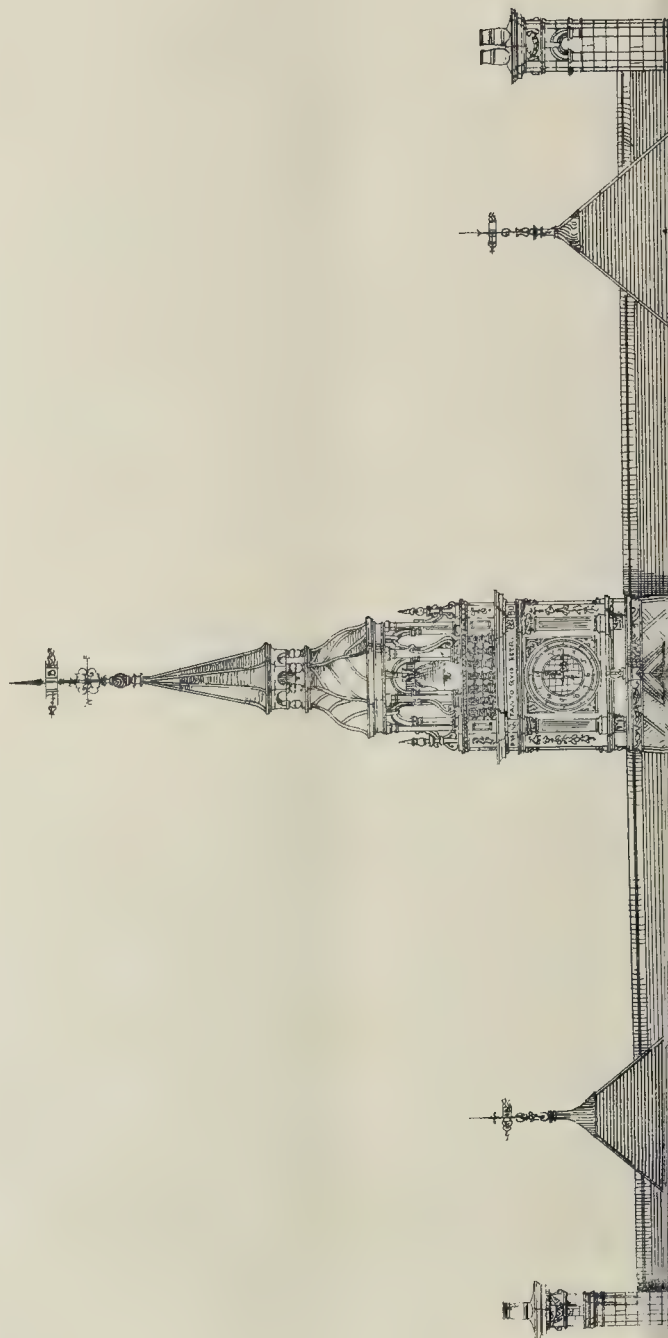
THE BUILDER. FEBRUARY 16, 1884.

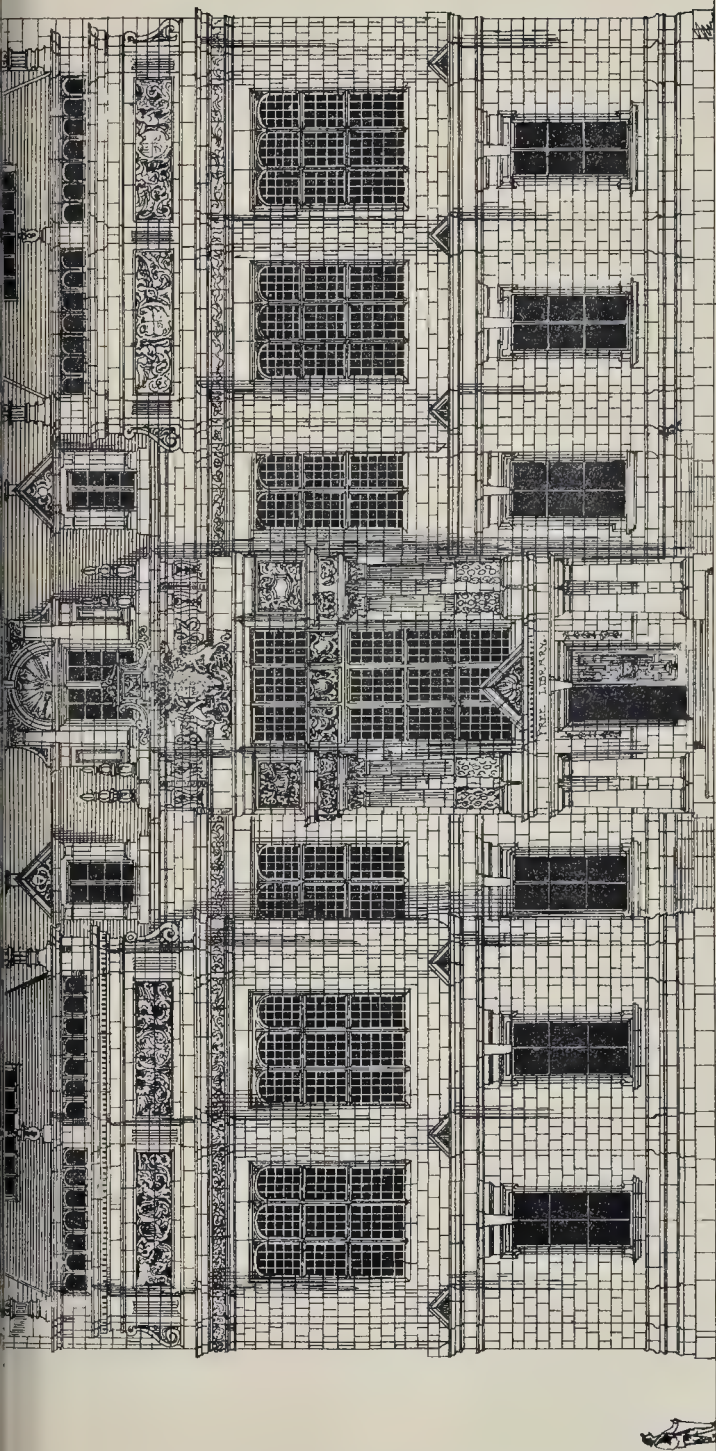


THE JUDGMENT OF THE SOUL BEFORE OSIRIS.
ILLUSTRATING MR. R. STUART FOOLE'S LECTURE ON EGYPT.





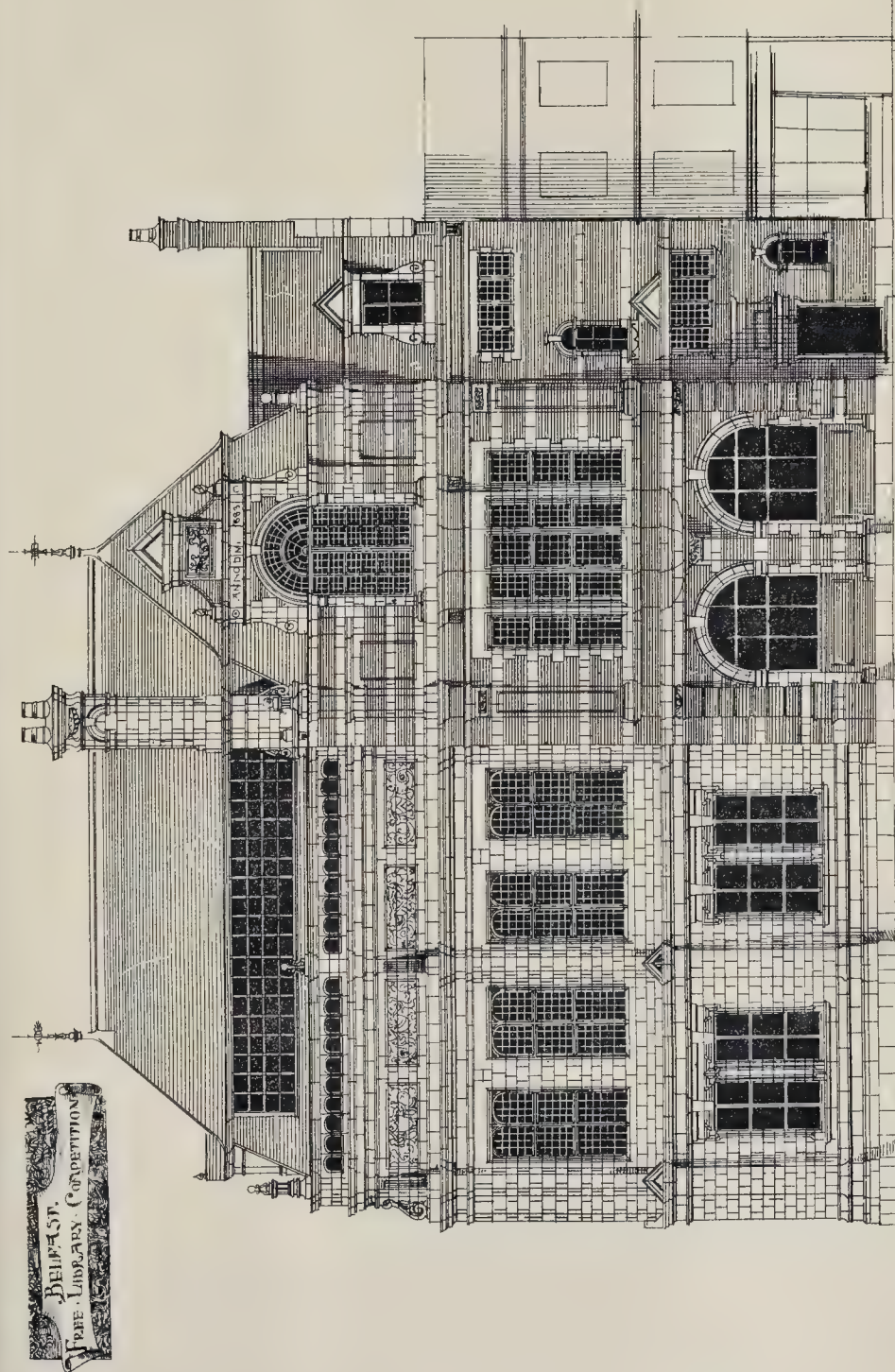




Front Elevation.

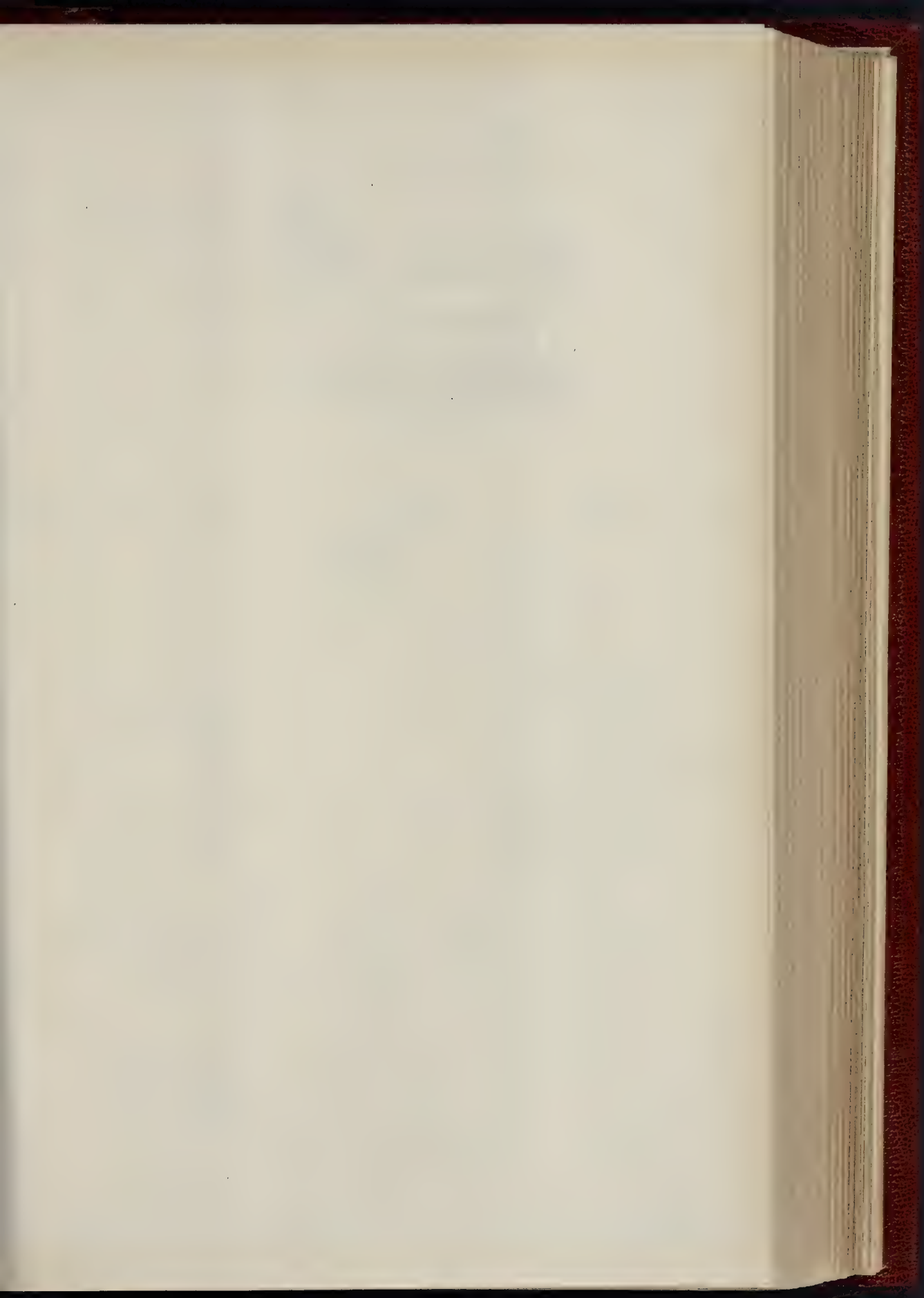
Messrs. T. N. Deane, R.H.A., and Son,
Architects, Dublin.



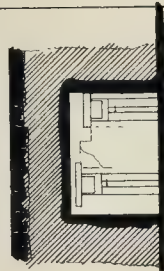
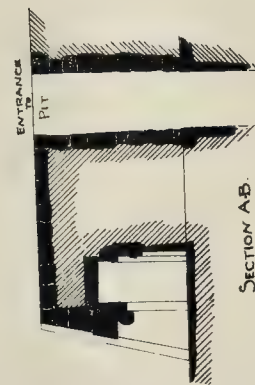
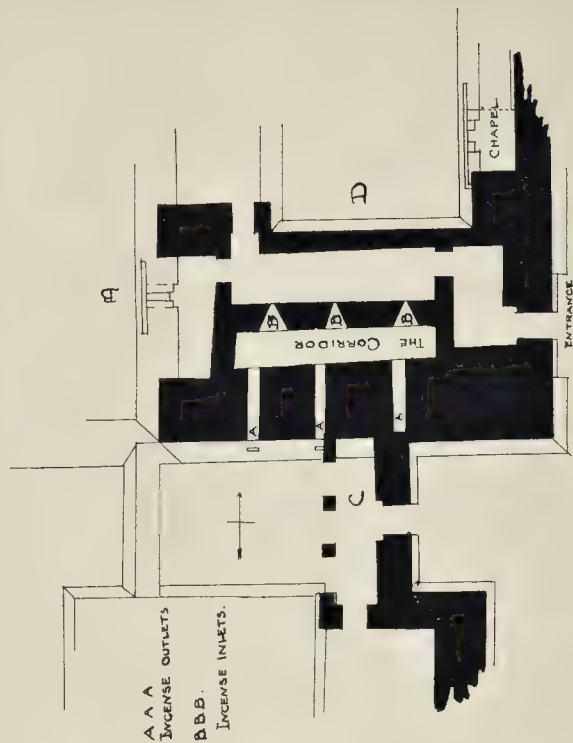
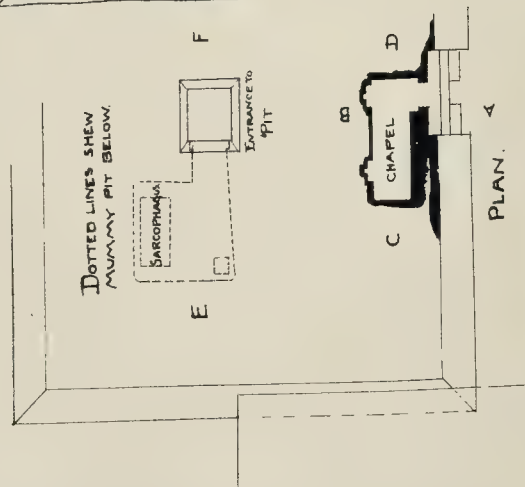


Side Elevation.

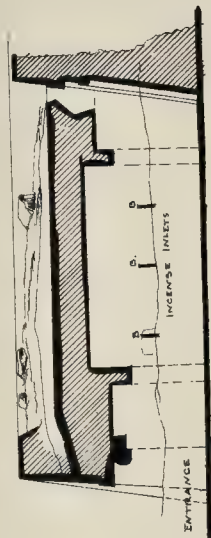
Messrs. T. N. Deane, R.H.A., and Son,
Architects, Dublin.



EGYPTIAN TOMBS.
illustrating lecture.
by MR. STUART POOL.
at the Royal Academy.
February 7th 1884.



EXAMPLE. A.

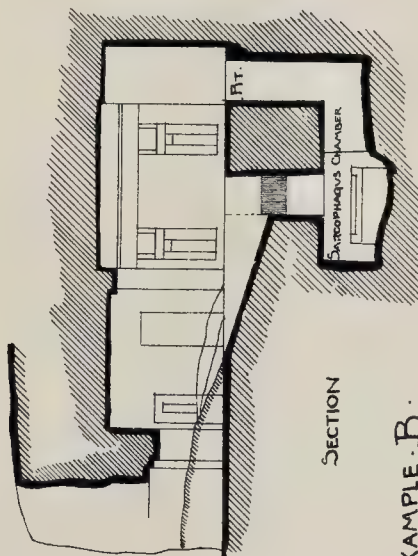
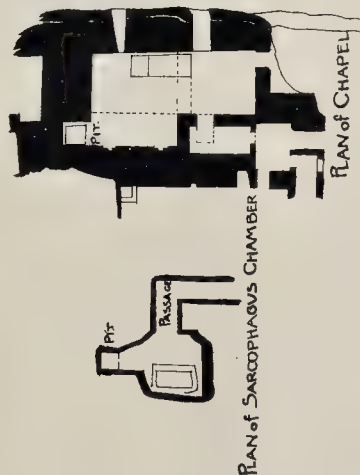


TOMB FROM MEMPHIS.

SKETCH OF CONDUIT
AND INCENSE BURNER
AT D.

SECTION C.D.

EXAMPLE C. TOMB AT MEMPHIS from Lepsius

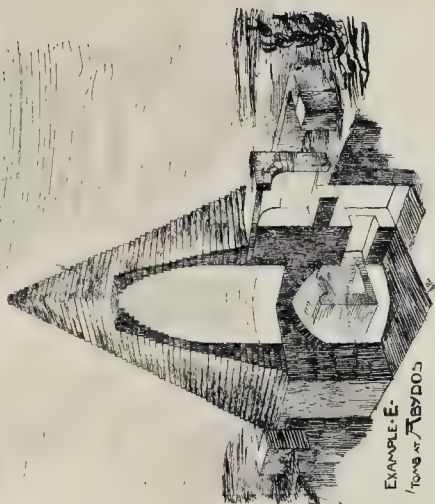


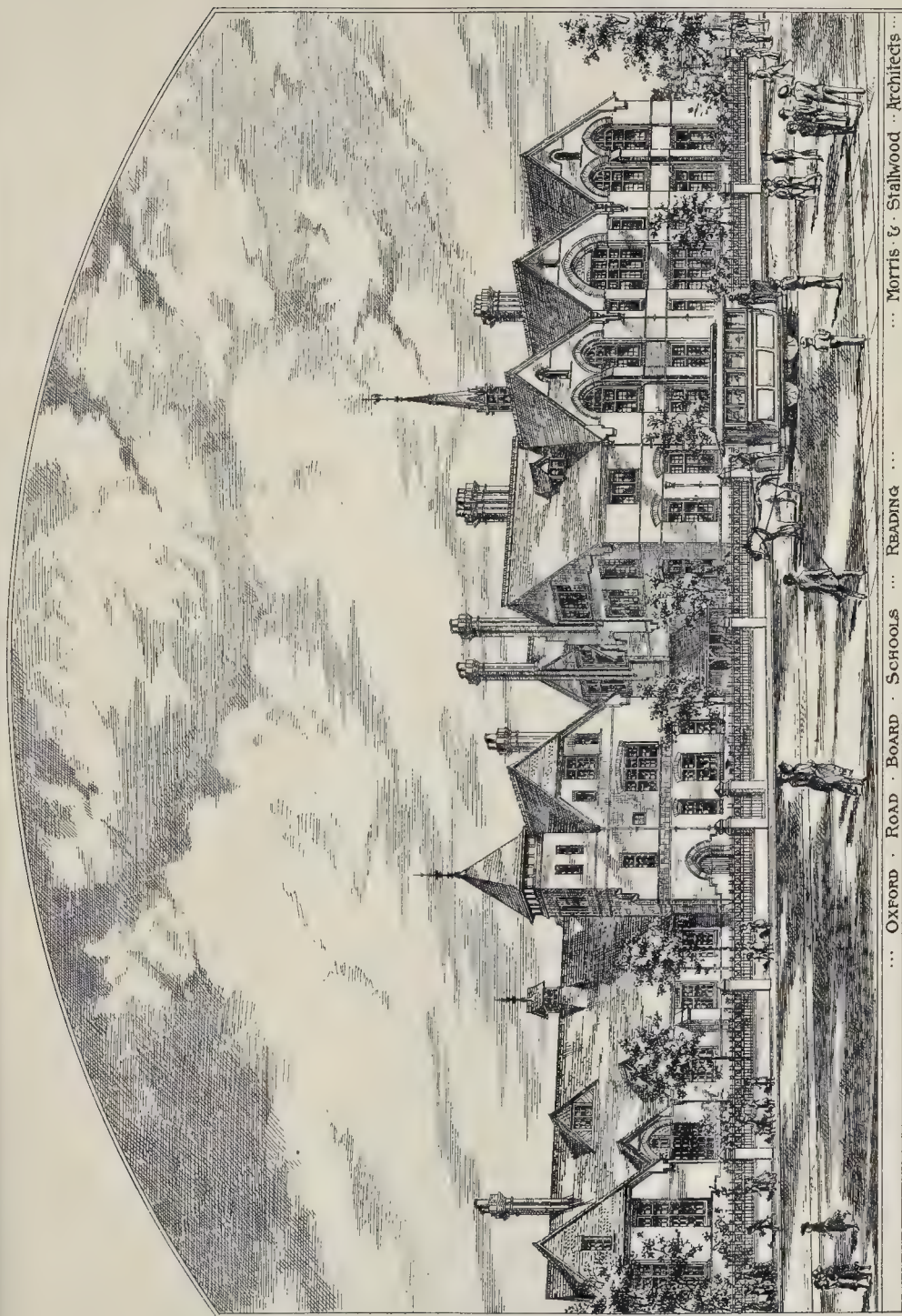
EXAMPLE B.

TOMB AT MEMPHIS from Lepsius.



EXAMPLE D. PLATFORM TOMBS
FROM LA RENUE ARCHÉOLOGIQUE





... MORRIS & STALLWOOD .. ARCHITECTS ...

... READING ...

... SCHOOLS ...

... BOARD ...

... ROAD ...

... OXFORD ...

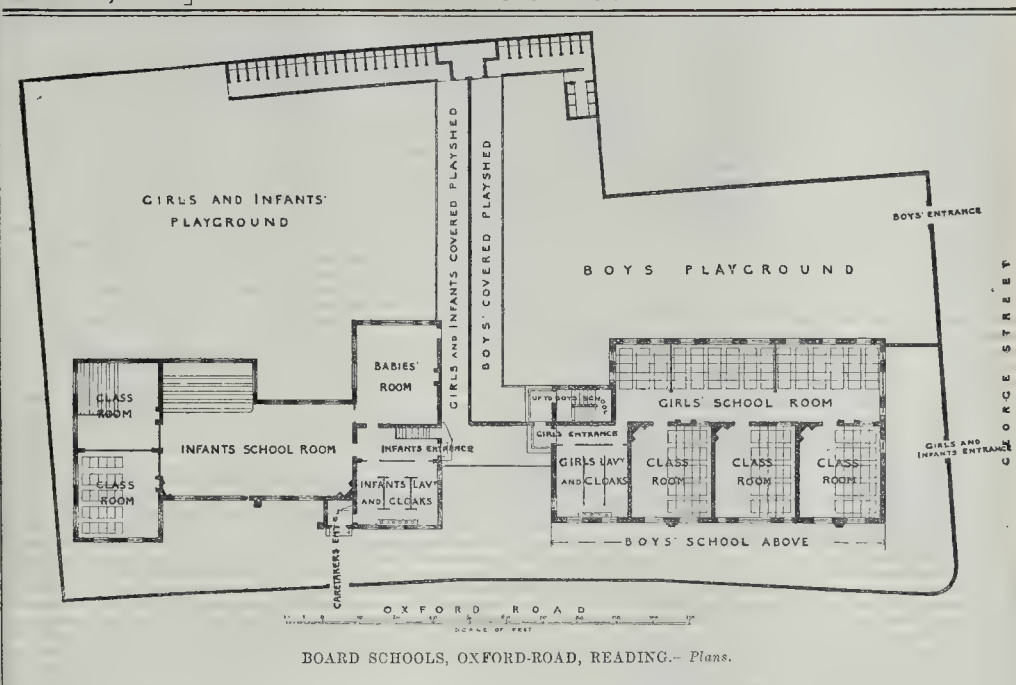
... STALLWOOD ...

... ARCHITECTS ...

... MORRIS & STALLWOOD ...

Queen St London WC

Wynne & Sons Photo-Litho



BOARD SCHOOLS, OXFORD-ROAD, READING.—Plans.

BOARD SCHOOLS, OXFORD-ROAD, READING.

THESE schools have been erected on a commanding site in the Oxford-road, Reading, for the School Board, and have accommodation for 800 boys, 300 girls, and 440 infants. The girls and boys occupy the two-story block, and the detached one-story block is occupied by the infants. The girls are on the ground-floor, and the boys above, the one floor being a counterpart of the other. The general school-rooms are 70 ft. by 22 ft., divided into three compartments by revolving screens, and to each floor there are three class-rooms, each 25 ft. to 22 ft., all of which are lighted by windows at the pupils' left hand. In addition there is a large cloak-room, 25 ft. by 19 ft., on each floor, with lavatories. The lower rooms are 14 ft. high, and the upper rooms are 12 ft. to the plate, and 25 ft. to the ridge, the whole roof being open. The floors are formed in tiers, rising 4 in. each where the desks occur. The external walls are 18 in. thick, and all internal walls are 14 in. thick.

The infants' department has a general room, 52 ft. by 25 ft., with a gallery recess, 25 ft. by 20 ft., in addition. Two class-rooms, each 24 ft. by 22 ft., divided by revolving screen; and a babies' room, 27 ft. by 22 ft., fitted partly with hammocks; there is also a cloak-room, 26 ft. by 22 ft., with lavatory. One wing of this department is carried up to provide apartments for the caretaker, manager's room, and teachers' rooms.

The offices are approached by a covered way from each department. The whole surface of the playground is formed of asphalt, and was executed by Messrs. Bradshaw & Co. The school and class rooms are finished with dual desks, to the architects' own design, manufactured by the Darlington School Furnishing Company. The floors are laid with concrete and road asphalt, and covered with wood blocks to prevent noise. The fireplaces are fitted with Shorland's Manchester ventilating-grates. There are also vertical tubes on what is called the "Tobin" principle for introducing fresh air, and Lloyd ventilators upon the roofs for carrying off vitiated air.

The works were executed by the late Mr. F. Vaughan, of Maidstone; Mr. Stroeter was the clerk of works; and the architects were Messrs. Morris & Stallwood, of Reading. The total cost of building, including playground, walls and fences, and all the furniture, was 7,200l., equal to 6l. 18s. 6d. per child.

ON COLOUR DECORATION.*

It will, as a rule, be found that where a flat ceiling has to be treated in colour only, without any aid of mouldings, it is desirable to maintain white as the ground, or, at any rate, to retain a great deal of white,—for without white it is difficult to indicate with sufficient clearness the main lines as distinct from those which have no more serious purpose than ornamentation,—that is to say, to distinguish the lines which affect proportion from those which are a part of the detail. This rule does not apply with the same force on curved surfaces, where less artificial suggestion of form is demanded, and where, moreover, gold can be used much more freely should the circumstances admit of it. Putting aside for separate consideration the question of mosaic decoration, it may not be amiss here to consider the treatment of the interior of domes or cupolas, often the culminating point of a grand decorative work.

The sectional curves of cupolas, of course, vary infinitely; and the rules which should guide their decorative treatment must, therefore, of necessity be somewhat elastic. Nevertheless, one master-rule may be said to apply invariably. It is that the vertical section or contour must be expressed and explained by the decoration, whether in moulded surface or in colours. This expression may be made to assist or modify the actual curve, but in some form it is essential. Without it an appearance of distortion, or of instability, or of confusion, is almost inevitable.

The methods of explaining the interior contour are numerous, and their several employments may be suggested by the varying conditions of scale, light, proportion, or actual contour. In domes which vertically exceed the hemisphere, a vertical division into "sectors" is by far the most direct and satisfactory means of expressing the curve. The strongly-defined vertical rib or band offers to the eye the readiest means of traversing the surface upwards. The intervening spaces may then be subdivided simply or elaborately, by horizontal lines or by curved lines according to the further explanation or elaboration demanded.

One subordinate axiom as to this vertical division may be noted. It may be taken generally that the higher the curve of the dome, the more numerous should be the vertical lines. Thus a low flat dome may be divided by vertical

bands into four parts or sections; but a high dome to receive a full expression needs to be divided into eight, twelve, sixteen, or more sections. The amount of horizontal division is generally far less important. Perhaps the explanation of this is that the eye perceives from the first that the horizontal section is circular; whereas the vertical section must always be unknown and demand explanation.*

When the dome is altogether on a large scale, it is essential that the vertical lines be expressed with more strength than any others. They contribute immensely to constructive expression, and to that effect of nobility which is given by height. There are, of course, plenty of well-known examples in which no systematic division has been adopted. In some early domes, usually of rather low section, figures are placed vertically on the unbroken curved surface. In such cases it is not easy to forget the distortion of those figures which do not face the spectator. In other instances, the surface is simply diapered with scroll or ornament. Of these I will presently say a word. In others, again (very few), figures or ornaments are arranged in horizontal bands or stories, which may be considered as the least satisfactory of all arrangements; but it is common to all these arrangements that the spectator can receive no impression of the contour or vertical section which it is in the very essence of the thing should impress him. Without the vertical expression, all that noble effect of stability and lightness, of solid structure soaring upwards by its own growth and with symmetrical perfection, is exchanged for uncertainty, and that curious mental demand for explanation which is a sure sign of defect in the artistic quality of architecture. It may be permitted the spectator of a great iron tubular bridge to "wonder how it is done"; for no sense of beauty is appealed to. But to the architect or his decorator the mere question is a severe criticism, if beauty has been his aim.

I have said that there are samples of domes in which the whole interior surface is merely diapered. It must, however, be noticed that if

* The division of the interior of the dome of St. Peter's, and its expression by colour, may be quoted as an admirable example both for effect and simplicity. The interior dome of the Sorbonne at Paris is very similarly dealt with. That of the "Invalides" is divided into alternate plain and coffered "sectors," the latter each consisting of a single vertical row of diminishing coffers. The Chigi Chapel at Rome has a low cupola divided into wide and narrow panels alternately. The dome of San Francesco at Naples, like that of the Pantheon at Rome, is entirely divided into square "coffers," diminishing upwards; but both these have rather low sections.

* A paper by Mr. John D. Crace, read before the Architectural Association on the 1st inst. See p. 191, ante.

this diapering be such as, being set out upon geometrical lines, diminishes during its repetition upward, in strict proportion to the diminishing diameter of the dome, it does in fact partly answer the same end as the more obvious vertical lines. It is the mode of decoration most frequently adopted in the domes of Arabian architecture; and (if the dome be not very large), undoubtedly, possesses a peculiar charm when aided by harmonious colouring; a charm partly due to a certain sense of mystery which pervades so much of Oriental art, and which powerfully affects the imagination. This influence, attained by geometrical forms, and pure ornament, aided by colour alone, is very remarkable, and deserves careful investigation.

The staircase is another important feature in every house; and since its decorative treatment often presents difficulties, it seems desirable to consider how they may best be met. I speak now not of such staircases as are to be found in large mansions, or in public buildings where architectural effect has been possible, and has been studied; but of those narrow or shapeless spaces which enclose the successive "flights" of the ordinary town house. In these one is confronted by the most irregularly-shaped wall surfaces, which usually succeed each other from ground floor to attic without break or definition. They are literally stair-cases, having walls "without form and void," overshadowed by a succession of equally shapeless raking soffits, with no expression of support, and unrelieved by so much as a moulding. This is obviously not encouraging ground for the decorator, who usually arranges the dado of despair, tints or papers the unmanageable polygons above it, and retires baffled. If he has been allowed to use a scrolling pattern in dismal greens he has perhaps the happy consciousness that he has imparted an "art tone" to the house by his treatment of the staircase, up which the visitor gropes his way in a monotony of green fog. But this is "fashion," not "art."

Where it is practicable,—and it is so in some of these staircases,—it is very desirable to make a broad distinction of colouring between the lower and upper stories, inserting a sort of string course at the level of, perhaps, the first floor. This at once gives breadth and stability of appearance, and helps to counteract that effect of perpetual treadmill which is so unpleasant in mounting an ordinary London staircase. Where it is not possible satisfactorily to effect this marked horizontal division, it is possible, and frequently advantageous, to adopt such a design of decoration or paper-hanging as admits of the repetition of horizontal lines at brief intervals. This was the one good feature of the old marbled papers in blocks, and which still leads people to assert that a staircase looks larger with a marbled paper, the sense of width being in fact due to the horizontal joints, not to the figure of the marble. Designers who have perceived this fact now produce patterns arranged on the same block system, and suitable for narrow staircases.

Where an open well-staircase exists, with stairs to the first or second floors only, and open wall above, much may be done with moderate use of colour in cornices and frieze to give a value to the whole. In such cases there should certainly be a well-defined frieze or string course at the level at which the stairs cease.

The soffits of the stairs may often be advantageously panelled out with mouldings, but where they are the plain soffits of stone stairs this is not very readily managed, and one must then have recourse to colour. A very simple use of even coloured lines will often be of considerable value. Again, much may be done to relieve the meanness and monotony of a London staircase by making a sort of vestibule or separate feature of one of the principal landings; and concentrating there your richer colouring and ornamentation instead of frittering them away in dribbles over the whole.

The use of stained glass in one form or another has become so frequent for domestic purposes that it is no longer necessary to advocate it. Perhaps it is rather necessary to ask for discrimination in its use. It does not accord well with light tints of pure tones in the decoration; but with low tones, whether light or dark, and with deep rich tones of colour it may usually be adjusted harmoniously. There are, of course, some restrictions connected with style which it is well to observe, because no mind trained in the history of art can altogether shake off those im-

pressions of fitness or incongruity which are the direct result of such training.

It is not my present purpose to go into the subject of colour harmonies, but rather to treat of the general laws and conditions which should influence the use of colour in decoration. It may not be out of place, therefore, to allude briefly to some of the unexpected difficulties which crop up in practical decoration. In the first place, to allow for the very astonishing differences between the colour as it appears on the palette and when transferred to the surface of ceiling or wall requires a considerable practical apprenticeship. Even a very large experience is insufficient to prepare one for the strange and fantastic tricks of reflected light; and it must be borne in mind that all ceilings are, by day, lighted entirely by reflected light. Hence it makes all the difference in the world to your colours whether there be a pavement, or grass, or a gravel path immediately outside your windows. So does it whether your floor is ultimately to be covered by a dark carpet or by, perhaps, a yellow matting, especially as you must know how to allow for either, since they cannot be laid down whilst your work is in progress. Your difficulties are, likewise, largely increased by the false shadows and reflections thrown on the ceiling by your scaffold. This is a fertile cause of mistakes in colouring, and I would especially warn you against the scaffolding which has been used by the plasterers, the whitened boards falsifying the light of your work, to your ultimate embarrassment. On this account when any critical point in the work is reached for the decision of questions of colour a good large space should be cleared of scaffolds. A fall of snow compels a complete pause, so far as adjustment of colours is concerned, the conditions under which the light is reflected being rendered completely abnormal. It is but a few weeks ago that in some very simple work in London I found myself frequently at fault in one front room, and discovered that this difficulty was entirely due to red blinds drawn down in some windows of a house on the other side of the street; though by no means directly opposite they were at such an angle to the room at the hour of my visit as exactly to reflect direct rays of red-tinted light into my room.

I have in former lectures spoken at length on the use of gilding in decoration, but cannot altogether pass it by here. Properly used it is most valuable, serving, as it does, several distinct purposes. It is valuable for explaining form, for lighting-up, surface ornament, for separating colours, and for the mellowing effect it has on all colouring. It gives the decorator a ready means of "emphasis," serving to carry the eye to the right points and along the right lines, even in the shadowed parts of the work, or where the colouring is deep enough to make emphasis of colour alone difficult. It should be borne in mind that gilding, to be successful, must be used boldly and with very defined purpose, because in some lights you will see the gilding when you cannot distinguish colours. Timid gilding, in meagre lines or detached patches, is always to be avoided. It has the same sort of effect as cheap finery, and is destructive of repose. Gilding, properly used, even where very freely used, never looks tawdry or vulgar; and where you find an interior spoken of as vulgar or tawdry from over-gilding, you may depend upon it that it is less the quantity of gold than its being in the wrong places which has produced the effect.

Reverting, indeed, to the question of "emphasis" in decoration, whether by gilding or otherwise, I may say that nothing is more essential to the success of any decoration. Its absence or insufficiency make any arrangement of colour very much what writing is without punctuation, or what speeches are without capitals. Just in the same way the use of purposeless and patchy gilding makes of a decoration much what misplaced aspirates make of a speech,—an unintelligible and vulgar jargon.

The use of gold ground mosaics for the purposes of decoration is a subject in itself, and I will only briefly allude to it here. A magnificent material for work of a monumental character, it seems to me unfitted to use promiscuously or in small patches, and on the level of the eye. I venture to protest altogether against its use for pictorial purposes in the small panels of a reredos, for instance. It can only be used with really adequate effect on large surfaces free from mouldings. It is worth while to turn to Ruskin's "Stones of Venice," and read his

remarks on incrustated decoration (St. Mark's, pp. 23, 24), which are full of true artistic perception of fitness.

The use of natural products, such as wood or marble, as part of the colour scheme of any interior, is a very excellent thing, and has made great progress of late years, though I have known architects paint handsome oak balustrades white for fashion's sake. The decorator must, however, bear in mind that these natural colours are for the most part very quiet in tone, and that careful modulation of tone is necessary in all the painted ornament that is to harmonise with them. All woods (with rare exceptions) belong, in colour, to the "low tertiary" class; and pale bright tones do not readily harmonise with them, although colours may be so used with them as to appear pure and bright. Marbles are of purer tones than wood, and admit of a somewhat brighter scale. No natural material lends itself more favourably to decoration, the mottled and varied combinations of colour in many marbles being most helpful to the general harmony.

The time at our disposal has not permitted me to do more than touch lightly on those rules which should, as I think, be always present in the mind of the decorator, both when designing his work and during its progress. To all rules there are exceptions; but only careful study and the experience of actual practice can teach you when to admit the exceptions.

The art of colour decoration is no simple one. Rightly understood, it requires much training, a habit of observation, and that sense of colour and delight in its harmonies which is as much inborn as the gift of music; but which, like the latter gift, is valueless without earnest, long, and continued cultivation. A man may be an accomplished architect, with sound and artistic sense of form and composition, and yet be a very poor colourist. Indeed, some go so far as to say that the mental training of the architect may be compatible with the art of the sculptor, but is not favourable to a sense of colour. I think that this, however, must depend much upon whether he starts with a strong sense of colour,—for if he does he can hardly fail to cultivate it. In any case a knowledge of the artistic side of architecture is indispensable to the formation of a good decorator; without it he cannot possibly sympathise with the architect's intentions, nor give intelligent expression to architectural forms.

It is quite certain, however, that unless a man be gifted with more than average powers he will rarely excel in both arts. Probably many an architectural student will drift into decorative work; and it is better to be a really skilful decorator than an indifferent architect. If he does so let us hope that such of his fellow students as distinguish themselves in the noble building art will call on him to aid them in perfecting and vivifying their work, nor fail to give him the credit due when he has used his magician's wand,—

"Miserum est aliorum in sumbere famam,
Ne collapsa ruant sub ductis tectis columnis."

"The dangerous building on another's fame,
Lest the substructure fail, and to the ground
Your baseless pile be hurled in fragments round."

[For a report of the discussion which followed the reading of this paper see p. 218, ante.]

An Outdoor Latrine.—The Chicago Sanitary News for January 15th gives a drawing of a form of outdoor privy, which has been designed by Messrs. Weatherly & Co., of Grand Rapids, Michigan, for avoiding some of the disadvantages of the ordinary establishment of that kind, in situations where there is at present no provision for a more civilised kind of accommodation. Under the ordinary privy seat is a vertical cast-iron receiver, a wide iron-pipe in fact, at the foot of which is a trap kept charged with water by overflow or rain-pipes from the house (which of course, in that case, must be additionally trapped between the house and the receiver. The soil drops into the water, and is supposed to be carried away at each flush of the trap from the discharges from the house waste-pipes and rain-pipes, and so goes to a water-tight cesspool at some distance. The point of the contrivance is, of course, the separation of the cesspool from the immediate proximity of the privy, and the keeping it closed, except when opened for cleaning, instead of having it permanently open as in the ordinary privy.

ARTISANS' AND LABOURERS' DWELLINGS.*

THE BUILDINGS OF THE PEABODY TRUST.

EACH living-room is amply provided with cupboard-space. In addition to two cupboards with shelves in the living-room, a large closet is fitted up in a recess which forms a sort of vestibule to the room near the entrance door. This contains a coal-bunk sufficient to hold half a ton of coals, and several tiers of shelves above. Most of the bedrooms have closets in the recesses formed by the chimney-breasts, furnished with rails and hooks for hanging clothes. A broad wooden shelf on iron brackets, and 15 ft. lineal of picture-rail with hooks, are fixed in convenient positions against the walls. All bedrooms have fireplaces, fitted with plain fire-lump stoves, 1 ft. 9 in. wide, and are supplied with 10 ft. lineal of picture-rail, similar to that in the living-rooms.

The laundry accommodation occupies the attic or central portion of each block on the top floor. It consists of two wash-houses containing washing and rinsing tubs, boiling coppers, tables, and other requisites, and a large laundry for drying the clothes.

One or two baths are provided for each group of buildings, according to the number of blocks upon the site; formerly more than these were supplied to the tenants, but they were so little used that their space was more profitably appropriated, and the present number has been found to be quite sufficient. The baths are of terra cotta, with a fine durable glazed surface; they are provided with fittings for the supply of cold water only. Each bath-room is furnished with a trellis-framed footbath and seat.

There are two sinks on each landing, placed in recesses on either side of the staircase. They are of terra cotta, and are fixed upon stout wood bearers, with a draining-board at one end sloping to the sink. Provision is made at the foot of the waste-pipe for the removal of any obstruction which might foul the trap.

The water-closets adjoin the recesses in which the sinks are fixed. Two are provided on each floor, viz., one for each sex. They are fitted with white glazed pans and stout galvanised iron apparatus. All the closets and sinks are over each other throughout the building, and are so situated as to secure a direct supply of water from the cisterns and an immediate discharge of the waste to the drains.

The waste-pipes are connected throughout their entire length with ventilating-pipes carried above the roof. In order that they may be occasionally examined and freed from the various obstructions with which they are too often choked, each stack is intercepted a few feet above its entrance to the drain by a small examination chamber with an iron flap and frame fixed at the base of the rear wall of the building, and secured by a strong latch and key.

The drains are of the best brown stoneware glazed socket-pipes, of Doulton's manufacture, laid with a fall of at least $2\frac{1}{2}$ in. in every 10 ft. lineal of their length. The soil drains are 6 in., 9 in., and 12 in. in diameter, according to the quantity of drainage they have to discharge; the surface and water drains are generally 4 in. in diameter. All the joints are carefully set in cement, and every precaution is taken to render the setting as clean as possible, so as to prevent obstruction to the free passage of the drainage over the joints of the pipes. It is desirable, if possible, to arrange the drains of a group of buildings occupying one site, so that the whole drainage system may be entirely confined within the limits of the site itself, and not carried beyond them until its discharge has been brought to one point in the most convenient situation for connexion with the nearest main sewer. At this "point," an examination-chamber should be provided sufficiently large to admit of the various obstructions which find their way into the drains, being removed before they can choke the outlet and drive the sewer-gas into the dwellings. If the position and distribution of the blocks in relation to the surrounding streets are such as to prevent the entire system of drainage from being confined within the limits of the site, it is desirable that the connexions with the adjacent main sewers should be as few as possible, and that the examination-chambers be placed where they

can be conveniently examined and be quite away from the buildings. It is needless to observe that no drains should pass under the buildings themselves, and that all waste-pipes should be fixed against external walls only, so as to admit of their direct outside discharge.

Water is supplied to the dwellings by a rising main fixed in the centre of the building, so as to be protected from cold in severe weather. This feeds the cisterns in the roof and immediately over the laundry. At the foot of the main a small draw-off cock is provided to empty the main in time of frost. The cisterns are of strong galvanised iron, and contain an allowance of forty gallons of water per day to each dwelling. They are three in number, viz., one large one, which receives the water direct from the main, and supplies the services for drinking and cooking purposes, and two smaller ones, which receive its overflow, and supply the water-closets and washhouses. Thus, although the cisterns are close together, and served by one main, they are not connected, and the water used for different purposes is not obtained from the same source. The overflows from the smaller cisterns discharge into the sinks on the topmost floors of dwellings, and have no direct communication with the wastes of the sinks themselves, or those of the water-closets. The various service-pipes are of galvanised iron, and lead direct from the cisterns to the washing-troughs, boiling-coppers, sinks, and water-closets. They are furnished with high-pressure loose valve-cocks, which are the best, as least liable to leak, and, if properly treated, answer their purpose well; but although every precaution be taken to prevent waste of water, this cannot be entirely avoided. As the buildings are lofty, the pressure in the company's main is often so great as to overpower the ball-valves which regulate the supply to the cisterns, and more water is discharged than can be used or accounted for. This is one cause of waste; another is the carelessness of the tenants themselves, who neglect to properly close the cocks after use. In consequence of this loss both to the consumers and the water companies, the latter have felt obliged to place certain restrictions on their supply, which are found to be so adverse to the consumers' interest, that they are being met by a strong and united opposition, and it is not improbable that a Bill may be passed during the coming session of Parliament by which water will be uniformly supplied by meter, and a high service constantly maintained.

Gas is provided for lighting the entrance, staircases, washhouses, and landries, but it is not supplied to the dwelling. It is lighted at dark, and put out at eleven o'clock, when the outer door of the building is closed.

There is but little to remark on the general construction of the blocks beyond what has been already stated. The materials employed are simple, and of the best description. Owing to the frequency of defective foundations on the sites which are selected for buildings of this class, and the absence of sand, gravel, or other available material which could be employed in the construction of the blocks, the cost of their substructure is often a very serious item. To reduce this as far as possible, in cases where the foundations have been carried to a great depth, the superstructure above the ground-line has been built upon arches in three and four half-brick rims in cement upon massive piers of concrete, brought up from a solid bed of maiden earth, and whose position on plan corresponds with the wall-spaces of the work above. By this arrangement a considerable saving is effected in the cost, and the stability of the building is increased.

All the walls and partitions between the rooms are of brick. The external walls are of picked stocks, relieved at intervals with flush bands of hard Suffolk. The external angles to the height of the string-course under the first-floor windows and the principal entrance doorway are of the hardest terra cotta. The cornice is composed of plain and bevelled Suffolk bricks, in alternate bands, finished by the filleted cast-iron eaves-gutter, which serves as the crowning member. The roof is boarded, and covered with Bangor slates; the ridges and hips are also of slate. The chimneys are placed as uniformly as possible with regard to the ridge, and in order that back smoke may be avoided, the fireplaces of adjacent rooms are not generally placed back to back.

The floors of the dwellings are of wood, which is not only more comfortable than tiles

or concrete, but is less liable to damage through the chopping and breaking of fuel, or other rough treatment. Wooden floors, moreover, if properly constructed and provided with a well plastered ceiling below them, offer a more effectual obstruction to the advance of fire than those which are called "fireproof," as is proved by the low premium required by the offices in which they are insured.

The floors of the sculleries are of stone, those of the washhouses and laundries are covered with asphalt on a bed of concrete resting on iron joists. The staircases and landings are of stone.

The whole of the internal walls are finished with a thin coating of Portland cement, which is very hard and affords a better protection from ordinary dilapidation and from vermin than common plaster. The entrance vestibule, staircase, and passages to the height of 4 ft. 6 in. are finished with a fine surface of cement of a deep red colour, which gives a warm and finished appearance to the interior of the building. A narrow band of buff tiles 2 in. wide finishes it against the cement coating of the rest of the wall.

The open spaces or courts which surround the buildings are covered with Hobman's tarpaving, laid upon a bed of rough concrete, and finished with a fine surface resembling asphalt. This has been found to answer better than gravel, which is dusty in dry weather, and is suggestive of stone-throwing and broken windows; it is preferable also, on account of its appearance and economy, to stone or brick paving.

The buildings are substantially built and plain in appearance; their arrangements have been made as simple as possible, to ensure economy in their original construction, and to avoid excessive demands upon revenue for their annual maintenance. Objections may be raised to this simplicity, as interfering too much with the comfort and domestic privacy of the tenants, and it may be said, that though the cost of land and the difficulty of obtaining sites where dwellings for the poor are most required, may make it expedient to provide for several families under one roof, yet the evils of association are increased by not sufficiently separating their accommodation; that the water and washing arrangements need not be in common; and that in many of the buildings which have been erected with a similar though perhaps not identical object, the dwellings have received that desired privacy by being made self-contained. It is to be feared, however, that this privacy is more apparent than real; by crowding the various water services, laundry furniture, and other domestic conveniences into one small chamber or scullery, as it is usually called, not only is the dwelling rendered unwholesome by having these in the near neighbourhood of the rooms which are occupied for living and sleeping purposes, and so depriving them of their proper freshness; but the deencies of the tenant's social life are seriously imperilled, if their own evidence is to be believed.

Self-contained dwellings, occupying several stories under one roof, cannot be compared with two-storied cottages, provided with small yards, and the requisite outbuildings, whose less-confined area allows their occupants comparative freedom from observation. All the arrangements of cisterns, pipes, and drainage are much more complicated in one case than the other, and their liability to get out of order, and their frequent need of attention and repair, render their maintenance much more expensive and troublesome. They form, too, so serious an item in the first cost of each dwelling, that a moderate rent is unable to supply a remunerative profit; consequently, a high rent is required, and those whose wages are insufficient to meet it are either excluded or compelled to take lodgers. Supposing, however, that profit were left out of consideration, and that the rents were regulated according to the most moderate scale, it would still be undesirable, as we have already shown, to supply the poor with conveniences which are seldom found even in the chambers and associated dwellings of the better educated. The lower sections of the industrious classes are not accustomed to treat anything which they use daily, and which does not belong to them, with much care or consideration; the strongest and plainest of the fittings with which their dwellings are furnished are too often incapable of resisting their roughness; and the recklessness with which they are handled, and the damage

* A paper read by Mr. H. A. Darbishire, F.R.I.B.A., Architect to the Peabody Trustees, at the Parkes Museum, on the 31st ult. See p. 192, *ante*.

which is done through their inability or unwillingness to be gentle, show how desirable it is to supply their wants in the simplest manner possible, and to give them the fewest opportunities for mischief.

The arrangement of dwellings in blocks has also been objected to. If sites were plentiful, unlimited in extent, and obtainable at a nominal cost, this objection might have weight, but so long as it is extremely difficult to get any site at all in localities where dwellings are most required; so long as the areas of such sites are so limited that they cannot be regarded as very desirable when they are acquired; and so long as the cost of these scarce and limited spaces is out of all proportion to their apparent value, so long will it be a matter of necessity to utilise every foot of space as far as can be done consistently with health and convenience.

The cost of a block of the dimensions already given, and containing fifty rooms, twenty sinks and closets, dust-cellars, stores, washhouse, and laundry, is about 4,000l., or 80l. per room. As the dwellings are not uniform in size, even in the same block, and, as in several instances of buildings already built it has been found expedient to regulate the rents according to the wage-earning powers of the population to be benefited, no uniform scale can be quoted, but taking an average the rent of a dwelling is 4s. 7d. per week, and of a room 2s. 1d., which includes everything. The weekly earnings of the tenants in 1882 averaged 1l. 3s. 6½d. per week, and the net return on the total outlay on land and buildings was 3½ per cent., after allowing a deduction of 30 per cent. for all expenses of repairs, management, &c.

This return will not be considered sufficient to induce a commercial public to regard the buildings as a good investment for capital at all equal in amount to the necessity which exists for them. Although it may not be enough to secure what is called "commercial success," it does more than enable the dwellings to be self-supporting, and it might be considerably increased were not the tenants required to assent to a condition, the importance of which cannot be too highly estimated, as any one acquainted with the habits of the poor will readily acknowledge. No underletting is allowed in these dwellings, under any pretext whatever.

This restriction prevents the tenants from increasing their weekly receipts, except by their own exertions; in other words, their standard of wages continues to indicate the section of the working class to which they belong. If, therefore, the dwellings are planned for the use and occupation of any particular section, and the rents are fixed according to the wages which that section receives, the accommodation supplied and the rent paid are justly balanced, and no unfair advantage is gained on either side; but, on the other hand, if the accommodation be too large or too small in proportion to the rent, and consequently to the requirements of the tenant, the balance is destroyed, and loss on one side must follow in consequence.

The sectional division of the working classes which we have advocated, if faithfully observed, will, it is believed, be found to do more towards securing and maintaining a just balance, and in advancing the social and moral interests of the poor, through the improvement of their dwellings, than any other arrangement which has yet been adopted; but it will not obtain a high revenue. Those who require this must be willing to sacrifice the interests of the poor for their own benefit. The demand for dwellings is so great that even the least desirable are eagerly applied for, and there is no difficulty in letting them at rents sufficiently remunerative to realise a very handsome income. This advantage has its drawbacks, however.

Independently of any condition as to the means by which the rents are paid, the tenants naturally adopt those which most readily occur to them for the supply of any deficiency that may arise from their weekly wages. Knowing that there are many who cannot afford a home of their own, and who even prefer an unsettled kind of life, they can calculate with confidence upon a considerable addition to their funds, as soon as they are prepared to sacrifice their privacy and to crowd their rooms with lodgers. The evils which follow need not be entered into now, but they are many, and their effects, especially upon the young, are so serious that, were they generally known, a fairly moderate return would be regarded with less disfavour, and the present compromise between self-interest and philanthropy would come to an end.

The conclusions which may be drawn from these imperfect remarks may be summed up in a few words, viz. :—

That before the working class, as a whole, can be suitably provided with dwellings, it should be divided, as far as possible, into sections.

That the standard of wages affects this division more accurately than any other, and affords the best means of determining the accommodation which is most consistent with the habits and mode of living of each section.

That each section should have its dwellings arranged with strict reference to its requirements, so that they may not be too large for convenience nor too confined for the purposes of securing health.

That the size, shape, and regular construction of the dwellings affect their cost and adaptability to the site upon which they are built, their sanitary condition, and the resources of the tenants.

That self-contained dwellings more than two stories in height are undesirable as residences for every section of the working class, and the privacy which is put forward as their chief recommendation is proved by experience to be more apparent than real.

That the rents of the dwellings should be proportionate to the wages of the section for which they are provided, and that no more than a fairly remunerative profit should be expected from them, so that the tenants may obtain the greatest amount of benefit in return for their rent; and lastly,

That the evils of underletting are most serious, and considerably exceed the advantages derived from any mere commercial success, which the buildings are able to yield by its aid.

In conclusion, there can be little doubt that in consequence of the interest which has been awakened, many undertakings will be organised, which have for their object the improvement of the dwellings of the poor. Whether these are to work on a definite system or not; whether their chances of success are to depend upon dearly-bought experience, or rest upon the uncertainties of experiments fostered by good intention; whether the anticipated benefit affect the entire working class or be confined to only one section of it; whether self-contained dwellings, or those which have been just advocated, be approved as the best,—certain it is, that after a comfortable and suitable dwelling has been provided, it rests more with the working man himself, than with any one else (except his wife), whether it prove as great a blessing as is expected and hoped for or not; and if the increase of wages and the additional leisure, which time and change have lately brought to him, are spent in the public-house instead of at home, the best-arranged dwelling that ever was built will do him no more real good than the most miserable cabin.

In the discussion which followed the lecture, The Chairman (Captain Douglas Galton), remarked that Mr. Darbishire had shown what could be done by a great and powerful association in providing dwellings for a large section of the people. In remodelling London they could not do better, possibly, than follow in the steps of the Peabody Trustees. It was our neglect that had led to so much overcrowding in London. If people chose to live in communities they must submit to certain laws and regulations which would be quite unnecessary for dwellers in the open country. One had no right to do anything in one's house which would be injurious to one's neighbours, and the community had the right to require that the houses occupied should be in a thoroughly satisfactory condition, whatever was the class of occupiers, and that these occupiers should conform themselves to regulations. A great amount of good could be done by legislation, which, he hoped, would be wanting in this direction. The Peabody Trustees were a reproducing body, devoting their profits to the improvement and extension of workmen's buildings, and a commercial company could not do that. He would like, however, to see a company started on the basis of selling dwellings, by the payment of instalments, to the working classes, so that each man might become, by degrees, the proprietor of his own house. What was required was to make the working classes the owners of property, which would be a real source of national stability.

Sir Curtis Lampson, bart., one of the Peabody

Trustees, said that their experience had been that of all people who had built houses, but they had profited by experience. He had found a constant tendency to overcrowding, which required the closest supervision. The Trustees received over 1,000l. a week in rents, and they had not made a loss of 100l. in a year. The death-rate in the buildings for the last five or six years showed about two in the thousand less than all London, and considering that they housed the poorest of the labouring classes, it showed what could be done by sanitary arrangements, and light and air. The question had now forced itself upon the attention of the Government, but he did not know how it would be solved. The present state of things in London was a disgrace to any Government. Economy of space was of such importance that he would not allow two-story houses in London proper, but would make greater elevation obligatory. The Artisans' Dwellings Act he considered a failure,—it was a measure which seemed only to have been made for the benefit of professional men. No one had yet put forward a practical plan for getting over this great difficulty, but he hoped that, in course of time, the London poor would be supplied with good dwellings.

Mr. Mark Judge said that many of the poor preferred the self-contained dwellings, and the cheapening of transit from the centre of London to the outskirts was a most important matter. Mr. Judge moved a resolution recommending the Council of the Parkes Museum to appoint a representative committee of medical men, architects, and sanitary engineers to investigate the whole question.

Dr. Rutherford seconded the recommendation, which was opposed by Mr. Dickens, of Kensington.

Mr. Poore remarked that some time since he was employed to make a report for the *Lancet*, on the dwellings of the poor. He believed that the only way to solve the question was to have a proper Building Act. A house should be licensed, like an omnibus, to accommodate so many inside, and no more. In proportion to the cubic space of the houses, so there should be a proportionate cartilage. He found that overcrowding was worst, not in the East End, but in the old houses in Soho, which had once belonged to the nobility. Excessive legislation only increased the difficulty; the great thing would be to educate the individual.

Mr. Judge's recommendation was then adopted by the meeting.

MECHANICAL APPLIANCES AS AN AID TO SCULPTURE.

SIR,—I have read with interest Mr. George Simonds's paper dealing with the above,* in which he says,—“Watt and Chantrey are said to have joined forces to effect it, but do not seem to have been altogether successful.” I have been occupied for some months in searching various records, and have now in the press a book on “Stone-working Machinery,” which, although chiefly dealing with the conversion of stone for building purposes, will contain a chapter on sculpturing machinery and a description of Watt's machines. There can be but little doubt that these machines, of which I have photographs before me,—were successful, and several busts and bas-reliefs executed by them are still in existence. A lengthened description and drawings of the machines will be found in a paper read before the Institution of Mechanical Engineers at Birmingham on November 1st, 1883, by Mr. E. A. Cowper, and I would refer any one desiring full information to that paper. A condensed description may, however, be of general interest to your readers. The first machine Watt called an “Eidograph,” and it was used for sculpturing or copying busts of the same size as the original. The machine,—which is still in existence,—consists, firstly, of an ordinary lathe, with treadle and fly-wheel, to supply the motive-power; and, secondly, of two tall uprights, about 7 ft. high, carrying at the top a slide on a strong horizontal bar; the slide being capable of motion horizontally, either at a slow or quick speed. Then, hinged to this slide, is a light square frame of metal, and, at the outer edge of this, another light square frame of metal is hinged, so that the lower edge of such frame is capable of motion

* See *Builder*, pp. 91, 141, ante.

up and down, or in and out, like an elbow-joint, and horizontally when the top slide is moved. The weight of these frames is balanced by levers and balance-weights and chains above, and the lower edge of the second frame is furnished with a "feeler" or "guide" to traverse over the original model, and a "drill" driven at a high speed by a light cord, to cut the work or copy; so that by handling the feeler carefully and tracing over the original in all directions a piece of marble or alabaster or wood placed in the machine alongside of the original is cut to a perfect copy by the machine without fear of any mistake, and without any special skill on the part of the operator.

The second machine made by Watt was for making a copy of a bust of reduced size; he called it a "diminishing machine." The machine consists, firstly, of a lathe-bed, with fly-wheel and treadle for obtaining the motive power for driving the drill; secondly, of a stout hollow tube forming a long lever, fulcrumed at one end on a "universal joint," so that the other end can be moved in any direction about the centre. This lever carries a "feeler," or blunt point, near its outer end, and a "drill" near the fulcrum, so that whatever motion the "feeler" has, the "drill" has (say) one-eighth part as much. Thus, if a bust or mask (in this case a plaster cast) is placed on the slide provided for it under the "feeler," and such "feeler" is carefully traced all over it, the "drill" will cut a piece of material placed under it, on the slide provided for it, to the same form, except that it will be one-eighth the size of the original. The lever is balanced. The slides above-named slide on the bed of the lathe, and are moved by a "pantograph," or arrangement of levers, to give one-eighth as much motion to the work to be cut as to the original, so that every dimension shall be in proportion. A further motion is provided for turning round the original and the copy, as is sometimes necessary when under-cutting a "bas-relief," and, of course, when copying the round figure.

M. POWIS BALE.

20, Budge-row, E.C., Feb. 1, 1884.

THE CARPENTERS' EXHIBITION.

SIR,—I really fail to see that Mr. Preston's letter [p. 217] answers me in any satisfactory fashion. I do not think the carpenters as a body will accept the statement that "the main object of the Carpenters' and Joiners' Companies had in inaugurating the exhibition was to develop latent talent." I claim the right, as a man born and bred to the trade, to challenge an assertion thus publicly made. Mechanics are getting extremely suspicious about these City companies, and, without any hesitation, I allege that it was not until the cry for reform arose that the City companies inaugurated these competitions; the "main object" being a pretence to perform those duties imposed upon them by their charters.

Here is a fair issue. Through the *Builder* I beg leave to ask Mr. Preston a question. The Carpenters' Company was formed and chartered to protect and encourage our trade: will Mr. Preston tell me what his company can claim to have done to encourage carpentry during the past twenty-five years?

HERBY DUNKLEY.

INTERNATIONAL HEALTH EXHIBITION.

SIR,—I quite agree with the observations of your correspondent, "Sanitary Engineer" [p. 217, ante], as to the unfairness of placing the apparatus or appliances of any exhibitor in the proposed model dwelling to be erected on the site of the exhibition, unless the same had received an award of merit; and I believe if the Committee were to provide such a building as that contemplated, after the various awards shall have been declared, and to fit up the same with a selection of the most approved exhibits, a great public benefit would result. The awards should be made with this end in view, and the dwelling constructed from the foundations to the finish with prize exhibits; and I am quite sure the cost of the same would be fully recouped by the large number of visitors who would be attracted to the "model dwelling." You, sir, would be doing a great service by bringing this suggestion to the notice of the Exhibition authorities, for it appears to me we do not usually see what particular and special results accrue from the various exhibitions frequently taking place in London. I, with many others, am waiting to know what direct and lasting benefit the Fisheries Exhibition will result in, and I have the same thoughts in regard to the International Health Exhibition.

H. H. BRIDGMAN.

SIR,—I noticed the letter in your last issue from "Sanitary Engineer," and quite agree with him in his remarks concerning the house the committee

intend building. The exhibitors who have their goods in the house would be more before the notice of the jurors. I hardly think this would be right to the other exhibitors, as the poor, although perhaps more talented, would have "a back seat."

AN INTERESTED ONE.

THE LATE GALE.

SIR,—My attention is drawn to a paragraph in the *Yorkshire Post*, headed "The Late Gale," copied from the *Builder*, in which it says:—"But, that the wind could really operate so forcibly upon the comparatively narrow area of the front of an engine as to overcome its weight, momentum, and mechanical power," &c. Permit me to say that the hindrance to a train is not when *meeting* a strong wind, but when the wind blows very strongly from *one side*, thus affecting the *whole length* of the train.

In the remarkable wind about October 14th, 1881, I travelled from London by a Great Northern fast train, leaving King's-cross at nine a.m.; on the incline between the 37 and 100 mile-stones we were so nearly brought to a stand while exposed to the full force of the *side-wind*, that a man might easily have got out on the lee side and have got into the carriage again; but directly we entered a *cutting*, and were thus protected from the side-wind, we gained pace immensely. We were, however, an hour late at Newark, the time being principally lost between Peterborough and Grantham.

A. S.

TESTS FOR PORTLAND CEMENT.

SIR,—Will you kindly allow me to point out with reference to your notice [p. 189, ante] of Mr. Fajja's "Portland Cement for Users," that the difficulty of obtaining the correct weight of Portland cement per struck bushel is obtained by having a filler such as Mr. Grant uses in his experiments, and that it is not easy to obtain uniformity in specific gravity tests, although they are largely used.

As to the fact that the coarse particles in Portland cement have little or no setting power, this was ascertained by Mr. Grant years ago.

ERNEST VAN PUTTEN.

DOOR FASTENINGS.

SIR,—Will any of your numerous subscribers inform me where I can procure fastenings for the outside doors of theatres, &c., such as will give way in a panic when pressed from the inside?

A CONSTANT SUBSCRIBER.

HOUSE DECORATORS' CLUB AND INSTITUTE COMPANY.

THE third annual general meeting of this company was held on Thursday, the 7th inst., in the Club Hall, Howland-street, Mr. J. G. Grace in the chair.

It will be remembered that this company was established to provide a club and hall for accommodating various societies connected with the trade, so as to form a central point of communication between employers and employees, and to furnish at the same time a healthy means of association between the members of the trade, a library and reading and billiard rooms being provided for improvement and recreation. Since the first meeting, held under the auspices of the Painter-Stainers' Company, who kindly lent their hall for the occasion, many employers and others have assisted by taking up shares, notably Messrs. Grace & Son, J. H. Donaldson, M. C. & F. Cowtan, R. Lyon, and J. C. O'Hara, and the company have leased the premises, 19, Howland-street, where the club has been carried on during the past year with, we are glad to learn, every prospect of success.

The report, showing that material progress had been made during the year, was after discussion adopted, the chairman remarking that their thanks were due to those members whose questions, by thoroughly ventilating the business, brought out the merits of the directors, who had evidently laboured hard for the welfare of the members of the Club.

The Secretary was then re-elected, Mr. G. Grant being elected treasurer, and Messrs. Taylor, Winter, and Maddison, auditors. The retiring directors were re-elected.

The Solicitor, Mr. T. F. Peacock, then read a letter from the architect, Mr. Lewis P. Craze, stating that all preliminary arrangements had been made with the various owners and leaseholders interested, and they might now proceed with the alterations and additions necessary to meet the growing demands of the club.

The Chairman, responding to a cordial and hearty vote of thanks, said he was very pleased to see how much good they had done in establishing a place where they could enjoy themselves in a rational manner, and hoped, in conclusion, they would continue to progress as they had done, and become a benefit to every member of their craft.

A. B.

BRISTOL JUNIOR ARCHITECTS' SOCIETY.

THE annual dinner of the Bristol Junior Architects' Society was held on Tuesday, at the Montague Hotel, Bristol, under the presidency of Mr. J. C. Moncrieff, A.R.I.B.A. (vice-president of the Society).

The loyal toasts having been duly honoured, the health of "the President of the Society" (Mr. Chas. F. Hansom, F.R.I.B.A.) was proposed by Mr. McPherson, and responded to by Mr. E. E. Ford; "Success to the Junior Architects' Society of Bristol" was next given by Mr. W. E. Hill, and acknowledged by Messrs. Bond and Froud; "The Vice-presidents" were proposed by Mr. Ford, and responded to by Mr. J. C. Moncrieff; "The Chairman," proposed by Mr. Ford; "The Hon. Secretary and Treasurer," proposed by Mr. McPherson; "The Founder of the Society" (Mr. Hill), proposed by Mr. Ford, and replied to by Mr. Hill; "The Council," proposed by Mr. R. C. Scone, and answered by Mr. Cridland. The toast of "Kindred Societies" was responded to by the Chairman on behalf of the Royal Institute of British Architects, and Mr. W. E. Hill, on behalf of the Architectural Association.

THE INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

THE members and friends of the Provident Institution of Builders' Foremen and Clerks of Works, to the number of about 120, dined together at the St. James's Hall Restaurant on Saturday evening last, the President, Mr. Mead, in the chair.

The Chairman, in proposing the toast of the evening,—"Success to the Builders' Foremen and Clerks of Works' Institution,"—gave an interesting account of the growth and prospects of the Institution, which was established now more than forty years ago, viz., in 1842. He dwelt upon the great value of the work done by the Institution, and referred with satisfaction to the fact that although last year there was, from various causes, a rather serious falling off in members, the financial position of the Institution was beyond reproach; and it was for builders' foremen and clerks of works to join the Institution and to share in the benefits which it was able to confer on distressed members or their beloved families.

The toast of "The Governor" (Mr. George Plucknett, J.P.) was proposed from the chair, and acknowledged on Mr. Plucknett's behalf by Mr. Miller, who testified to the great interest which that gentleman had, for so many years, taken in the welfare of the Institution.

Mr. Bedford, one of the secretaries, gave an interesting summary of the financial position of the Institution, which had up to the end of the year 1882 spent upwards of 5,000*l.* in assisting members and their families, while at the present time it possessed funded property to nearly the same amount. He believed that for the sum of 2*l.* per annum paid by each member they were able to afford proportionately greater assistance to their members than any similar society.

Among other toasts proposed were "The Architects," on whose behalf Mr. Frazer replied; "The Builders," "The Visitors," &c., for whom Messrs. Frampton and Cheek responded. Altogether a very pleasant evening was spent, although the apartment in which the dinner was given was apparently devoid of any adequate means of ventilation.

We are glad to hear that of late there has been a considerable accession of new members to the Institution, and we have no doubt that the secretaries will be pleased to give further information about it to all inquirers who will write to them at the office, No. 9, Conduit-street, W.

UNHEALTHY HOUSES.

BRITISH MUTUAL BANKING COMPANY V. HIGGINSBOTHAM.

THIS was an action tried in the Brompton County Court on the 29th ult., for rent, the defendant counter-claiming for damages sustained in consequence of the alleged unhealthy state of the house.

Mr. J. Archer was called for the plaintiffs, as was also Mr. Banister Fletcher, who had made a special investigation into the sanitary arrangements of the premises.

Mr. King, the engineer of the London Sanitary Protection Association, and several witnesses who had lived in the house, were called for the defendant.

The Judge (Mr. Stonor) gave judgment for the plaintiffs for the rent claimed, and dismissed the counter-claim with costs.

Professor Newton's Sixth Lecture on Lycian Art Monuments, delivered at University College on the 8th inst., treated of the Lycian language and written character as they are known to us through inscriptions found in Lycia. We will give some notes of it, as well as of the concluding lecture ("On the Tomb at Djobhashi") in our next.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Jan. 25, 1884.

- 2,096. B. D. Healey, Brighouse. Asphalte apparatus.
2,110. A. Drummond, Edinburgh. Sash-bars or astragals.
2,121. A. Drummond, Edinburgh. Glazed structures, &c.
2,129. W. B. G. Bennett, Southampton. Automatic flushing apparatus.

Jan. 26, 1884.

- 2,178. T. Atkins, Drayton. Affixing knobs to their spindles.
2,176. A. W. Kershaw, Lancaster. Ventilators.
2,178. J. W. Sisson, London. Lock-knob fastener.
2,182. W. St. J. Joyce, Dublin. Fire-grates.
2,187. A. Woods, Northampton. Suspenders for curtains, &c.
2,194. W. B. Carne, Kingsland. Sliding sash-frames.

Jan. 28, 1884.

- 2,237. J. Walsh, London. House and floor cleaning utensils.
2,244. C. Jones, Derby. Securing scaffolding.
2,246. T. Nield, Sandbach. Supporting window-sashes, &c.

Jan. 29, 1884.

- 2,301. J. Coulson, Blackburn. Water-closets, &c.
2,323. J. Hatfield, Kew. Artificial stone.
2,338. J. Sherrin, Ramsgate. Window decoration, &c.
2,347. C. M. Tate, London. Ventilating, heating, &c., the atmosphere of rooms, houses, and buildings.
2,348. C. M. Tate, London. Filtering and purifying the inlet air to rooms and buildings.

Jan. 30, 1884.

- 2,374. J. Mould and J. J. Mould, Birmingham. Zinc roofing.
2,377. W. Beddows, Farnworth. Chimney-pots.
2,379. S. Willett, London. Window-fastener.
2,382. J. Hillyard, Oaklea, and W. K. Hilliard, Newcastle-upon-Tyne. Pin for fastening down carpets, &c.
2,394. J. J. Barton, London. Hanging window-sashes.
2,397. J. Finne, Ayr. Hooks for roof gutters, &c.

- 2,404. G. F. Harrington, Ryde. Cow arrangements for ventilation.
2,413. D. Griffiths, Erdington. Roofs.

Jan. 31, 1884.

- 2,435. W. Macvittie, Wyld Green. Sash and casement fastenings.
2,446. J. Badger, New York, U.S.A. Window ventilators. (Comp. spec.)
2,460. D. Page, Folkestone. Lead traps for water-closets, &c.
2,461. C. Crisford, Eastbourne. Joiner's plough, &c.
2,478. A. Younie, Greenock. Kitchen ranges.
2,486. R. Croftwaite, London. Fire-grates. (Comp. spec.)
2,489. W. Edwards, London. Self-closing doors and gates.

Feb. 1, 1884.

- 2,524. G. C. Davies, London. Access pipes for house-drains, &c.
2,526. P. Butler, London. Ventilation of houses and buildings.
2,560. S. Coulson, Birmingham, and W. H. Edwards, Wyld Green. Apparatus for opening, closing, and securing windows.

Feb. 2, 1884.

- 2,576. W. Crook, Salisbury. A smoke and hot-air flue.
2,578. S. Turner, Barrow Haven. A ridge-tile for ventilating.
2,601. H. O. A. E. Gruenbaum, London. Apparatus of respiration for ventilating, &c.
2,604. A. Sweet, London. Water service-valves.
2,608. S. Duprat, Paris. Roofing tiles.
2,614. J. Donkin, Bournemouth. Earth and water closets.
2,634. C. Fowler, Leeds. Glass roofing, &c.
2,640. A. Guattari, London. Manufacture of marble. (Com. by M. Soderini, Florence.)

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

Feb. 4, 1884.

- 2,653. C. D. Riley, Huddersfield. Chimney-tops.
2,686. A. B. Johnson, London. Window-sash fastenings.

Feb. 5, 1884.

- 2,734. S. U. C. Thompson, London. The tops of chimneys.
2,751. J. Shaw, London. Saving fuel and preventing smoke in open fire-places.
2,774. T. H. Williams, London. Spring hooks for window-blind cords.
2,777. W. Monnery, London. Wall-ties.
2,783. W. J. Penny, Southend. Combined inlet and exhaust sash-frame ventilator.

Feb. 6, 1884.

- 2,797. J. A. Slater, Birmingham. Window reflector.
2,816. E. Taylor, Blackburn. Preventing down draughts in smoky chimneys.
Feb. 7, 1884.
2,884. W. Cowell, Burnley. Apparatus for heating buildings, &c.
2,920. J. G. Lorrain, London. Ventilators.

SPECIFICATION ACCEPTED, and open to public inspection for two months:

Feb. 8, 1884.

521. W. H. Renwick, Newcastle-upon-Tyne. Water-closets.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Jan. 29, 1884.

- 4,614. W. G. de F. Garland, East Molesey. Construction of fences. Sept. 28, 1883.
4,641. G. G. MacWilliam, London. Water-closet basins. Sept. 29, 1883.
5,824. A. M. Clarke, London. Metallic plastering surfaces. (Com. Z. J. Stanley, New York, U.S.A.) Dec. 20, 1883.
5,825. J. Shanks, Barrhead. Water-closets, &c. Dec. 21, 1883.
5,884. E. M. Wood, Natick, U.S.A. Green-houses. Dec. 28, 1883.
5,925. J. S. Stevens and C. G. Major, London. Spring hinges for doors. Dec. 29, 1883.

Feb. 1, 1884.

- 5,821. G. M. Morgan, London. Working marble and other stone, &c. Dec. 20, 1883.

Feb. 5, 1884.

- 4,684. A. J. Boulton, London. Ventilating apparatus. (Com. by L. J. Wing, New York, U.S.A.) Oct. 2, 1883.
5,112. J. W. Gibbs, Liverpool. Ventilators. Oct. 29, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending February 9, 1884.

- 2,827. W. P. Thompson, Liverpool. Seal traps for wash-basins, water-closets, &c. (Com. by A. Edwards, Ashbury Park, U.S.A.) June 7, 1883. Price 4d.

An iron trap is used, which is filled with mercury. This becomes oxide of mercury, and forms a poisonous barrier to all forms of organisms. (Pro. Pro.)

- 2,828. G. Wedgwood, C. F. Wedgwood, I. Wedgwood, and G. A. Marsden, Etruria. Ornamenting bricks, tiles, and other fictile articles. June 7, 1883. Price 2d.

The templates are made of strong oiled paper. (Pro. Pro.)

- 2,836. F. G. Lynde, Melton Mowbray. Latches for doors, cupboards, windows, &c. June 7, 1883. Price 2d.

These consist of a ball partly projecting through a slot in the front of a box in the door, &c., which engages in an aperture in the frame. (Pro. Pro.)

- 2,845. J. McConnell, Ballymena. Metallic cement. June 7, 1883. Price 2d.

This is made of brimstone, black powdered antimony, and plumbago. (Pro. Pro.)

- 2,886. S. C. Davidson, Belfast. Stoves or air heating apparatus. June 9, 1883. Price 8d.

This is an improvement on Patents 4,773 of 1877 and 983 of 1880 in fixing the stoves to burn gas instead of coal, &c., and in arranging a lining on the sides of the fireplace, within which the air is heated before it reaches the gas-burners.

- 2,898. S. Chandler and J. Chandler, London. Water-waste-preventers. June 11, 1883. Price 2d.

A lift-up valve is combined with a syphon, and the cistern can be emptied by either. (Pro. Pro.)

- 2,921. C. Major, Bridgwater. Roofing tiles. June 12, 1883. Price 6d.

These tiles have undercut or recessed parts at the upper

top corners to interlock with corresponding parts in the adjacent tiles.

- 2,929. F. Piercy, London. Water-closets. June 12, 1883. Price 6d.

A flexible pipe is connected to the centre of the seat cover, on the underside of which are packing rings to fit closely on the top of the basin and thus make it air-tight when the cover is closed. The handle is then lifted through an aperture in the cover, and any foul gas is carried off through the pipe.

- 2,932. J. W. Holland, London. Construction and arrangement of cowls, exhausters, or ventilators for chimneys, &c. June 12, 1883. Price 8d.

The essential part is the fitting larger air-tube round the flue and bending over the tops of both the tubes, while on the outer tube is a revolving cowl with a vane.

- 2,943. W. P. Thompson, Liverpool. Fastening or clamping apparatus applicable for builders' scaffolding. (Com. by C. Mansion, Paris.) June 13, 1883. Price 6d.

A clamp made of two semicircular pieces joined together is passed round up the right pole, and a chain is attached thereto by a ring. The chain is then passed round the horizontal pole, then round the upright pole, and again round the horizontal one, and secured to the ring.

- 2,967. J. E. Manock, Heywood. Stench-traps. June 14, 1883. Price 6d.

The upper portion of the box which carries the "grid" is made separate from the lower portion, which carries the "trap."

- 2,969. R. McCombie and W. Seaman, London. Water-closet basins. June 14, 1883. Price 6d.

These are rather flat basins, and the inlet arm is placed low down therein. The chief supply of water enters the basin at the level of the water, while other smaller streams are directed above and below the water in the basin. The outlet is made larger than is usual.

- 3,013. W. Ayres, London. Stench-trap for drains, &c. June 18, 1883. Price 6d.

The trap frame has a gutter in which flanges on the upper edges of the trap drop and form a seal in addition to the usual seal below.

MEETINGS.

MONDAY, FEB. 18.

Royal Institute of British Architects.—Mr. Killingworth Hodges, A.M.I.C.E., on "Precautions to be adopted on introducing the Electric Light into Houses." 8 p.m.

Royal Academy.—Mr. G. Aitchison, A.R.A., on "Colour applied Inside Buildings: Marble and Mosaic." 8 p.m.

Society of Arts.—Mr. R. W. Edis, F.S.A., on "The Arrangements, Aspects, Design, and General Planning of London Houses." (Cantor Lectures.) 8 p.m.

London Institution.—Mr. J. Bryce, M.P., on "An Ideal University." 5 p.m.

TUESDAY, FEB. 19.

Institution of Civil Engineers.—(1) Adjourned Discussion on Mr. Conder's paper on "Speed on Canals"; (2) time permitting, Mr. S. W. Barnaby on "Hydraulic Propulsion." 8 p.m.

St. Paul's Ecclesiastical Society.—The Rev. S. M. Mayhew on "St. David's Cathedral." 7.30 p.m.

Royal Institution.—Dr. Archibald Geikie, F.R.S., on "The Origin of the Scenery of the British Isles." 3 p.m.

WEDNESDAY, FEB. 20.

British Archaeological Association.—Mr. W. H. Butecher on "The History of the Castle of Devizes." 8 p.m.

Society of Arts.—Dr. Hyde Clark on "Reclamation of Land on the North-Western Coast of England." 8 p.m.

Royal Meteorological Society.—(1) Mr. W. Marriott on "The Great Storm of January 26th, 1884"; (2) Prof. E. D. Archibald on "The Height of the Neutral Plane of Pressure, and Depth of Monsoon Currents in India"; (3) The Hon. F. A. Rolfe Russell, M.A., "On the Sunrises and Sunsets of November and December, 1883, and January, 1884." 7 p.m.

THURSDAY, FEB. 21.

Royal Academy. Prof. C. T. Newton on "The Monuments of Ancient Art which have been discovered between the time of Winckelmann and 1850." 8 p.m.

Society of Antiquaries.—Mr. Edwin Freshfield on "The Records, History, and Inventories of St. Stephen's, Coleman-street." 8 p.m.

Institution of Civil Engineers.—Prof. Fleeming Jenkin on "Gas and Caloric Engines." 8 p.m.

London Institution.—Prof. R. S. Ball, F.R.S., on "The Doctrine of Evolution applied to the Solar System." 7 p.m.

Society of Engineers.—Mr. J. W. Wilson, jun., on "The Work of the Drawing Office." 7.30 p.m.

FRIDAY, FEB. 22.

Royal Institution.—Sir Frederick Bramwell on "London (below Bridge) North and South Communication." 8 p.m.

Institution of Civil Engineers (Students' Meeting). Mr. E. J. M. Davies on "The Qualities of Metal for Various Purposes." 7 p.m.

Miscellaneous.

Leathersellers' Hall.—This hall has been re-decorated by Messrs. Battam & Heywood. In the banqueting-hall the panelled ceiling is gilt solid, with hand-painted ornaments in panels. The jewels surrounding the ceiling are decorated with tracery work; the deep cove is also gilt solid and decorated with festoons of leaves, wreaths, &c.; the walls are set out in series of panels, with ornamental pilasters, surmounted with pediments and vases, decorated in gold and colours; the panels are covered with rich gold colour brocatelle silk. In the reception room the enriched tracery ceiling is decorated in an elaborate manner in gold and hand-painted work in various tones, the cornices dealt with in similar colours and gold, and the whole of the walls above the oak dado covered with rich crimson silk damask. The smoking-room ceiling is divided into a series of panels; the mouldings gilt solid, with bosses; the panels are painted in various tints; a deep frieze is decorated with hand-painted work; the walls are hung above the oak dado with Japanese paper. The painted ceiling of the entrance-hall and corridor is decorated in colours and gold, and ornamented with hand-painted work; the cornice decorated in colours, picked in with gold; the walls covered with rich stamped leather paper above oak dado. In the lavatories, lobbies, &c., the ceilings and walls are executed in workmanship and design of proportionate elaboration.

British Archaeological Association.—At the fifth meeting of the session, held on the 6th inst., the chair was occupied by the Rev. S. M. Mayhew. Mr. McIntyre North exhibited a sketch of some remains of old Winchester House, Southwark, recently discovered. Mr. Loftus Brock, F.S.A., described a series of Roman Consular coins in silver, and referred to the high artistic merit of their designs. Mr. Cecil Brent, F.S.A., exhibited a fifteenth-century roll, setting forth in chronological order the principal events of early history, which were read by Mr. W. de Gray Birch, F.S.A. Mr. A. B. Wyon read a paper, giving an account and description, illustrated by casts, of the various seals used by Henry VI., as king of France, including three which have not been hitherto known; and also of a seal in the British Museum, much obliterated, attached to letters patent of Henry VI., which Mr. Wyon proved to be that of Philip, Duke of Burgundy, and used A.D. 1425, for the Great Seal of Henry VI. The proceedings were brought to a close by some fitting remarks made by Mr. Thos. Morgan, F.S.A., treasurer, on the loss to archaeology by the death of Mr. J. H. Parker, C.B., of Oxford.

The Gambetta Monument.—The commission appointed for the erection of a monument to Léon Gambetta has published the programme for the competition. Although only French artists may participate in it, its details are not without interest to others. The cost of the monument is not to exceed 350,000 francs. Designs are to be sent in between May 25th and June 1st, and they will be publicly exhibited from June 3rd to 15th. The authors of the three best projects will be invited to take part in a second competition, in which the same jury will adjudge. In this second competition the author of the first prize receives a premium of 10,000 francs, or the execution of the project, and the two others prizes of 6,000 francs and 4,000 francs respectively. Should the second competition be without satisfactory result, the three competing artists will each receive prizes of 3,000 francs. The jury consists of fifteen members, ten of which are selected by the commission and five by secret voting by the competitors themselves.

Exhibition of Thermometers.—The Council of the Royal Meteorological Society have arranged to hold at 25, Great George-street, S.W., by permission of the President and Council of the Institution of Civil Engineers, on the evening of March 19th next, an Exhibition of Thermometers. The committee will also be glad to show any new meteorological apparatus invented or first constructed since last March, as well as photographs and drawings possessing meteorological interest.

"Adjustable Electric Thermometers."—Messrs. J. T. Gent & Co., of Leicester, write (with reference to a paragraph in our last), that they have made "Adjustable Electric Thermometers" for at least ten years.

Competition for a Natural History Museum at Hamburg.—The Senate of Hamburg has invited competition for a natural history museum. There is to be a preliminary competition with sketches to a scale of 1 in 200, and a perspective representation. The authors of the five best designs will each receive prizes of 1,000 marks, and acquire, at the same time, the right to take part in the closer competition, for which they will be paid a honorarium of 4,000 marks each. The programme for the second, deciding, competition stipulates for completely worked out plans in all their artistic and descriptive details, but at the same time for a written guarantee of the competitor that the cost of the work, in case he is charged with its execution, will not exceed the sum of 900,000 marks, his honorarium being retained as a caution money. The successful architect in this second competition receives, in case the work should not be carried out, 1 per cent. of the above estimated cost, and 3 per cent. if the museum is built. The competition is stated to be unlimited (? international). Plans must be sent in by April 30, to the "Bureau der Ober-Schulbehörde, Steinthorplatz, Hamburg," where also the conditions and a plan of the building site may be obtained.

London and Middlesex Archaeological Society.—At a meeting of this Society, at 4, St. Martin's-place, Trafalgar-square, last Monday evening, the 11th inst., a paper written by Alderman Staples, F.S.A., on "Members of the Goldsmiths' Company who have been Aldermen of the Ward of Aldersgate," was read by Mr. E. W. Brabrooke, F.S.A., in the unavoidable absence of the Alderman. This was followed by some remarks by Mr. George Lambert, F.S.A., on the antiquity and importance of the Goldsmiths' Company. A paper was also read on "Recent Archaeological Researches in London and Elsewhere," by Mr. J. E. Price, F.S.A., secretary, illustrated by drawings and plans. The author alluded to the discoveries recently made near the Tower of London, part of the old wall of the City being brought to light through the excavations connected with the railway works at Trinity-square and Tower-hill. He also gave an interesting description of the recent discovery, in the city of Bath, of ancient Roman baths, and extensive remains of other buildings connected therewith, illustrated by photographs. He exhibited a portion of the loaden lining of the bath five-eighths of an inch thick, which has since been presented to the new Roman and Saxon Gallery of Antiquities in the British Museum.

Cremation.—Dr. Cameron has secured the 30th of April for the second reading of his Bill regulating cremations. The Bill, which also bears the name of Sir Lyon Playfair, who gave evidence before the Royal Commission on intramural burials, has for its object the strict supervision and regulation of all crematoriums, public or private, which may be established in the country. At present, cremations may take place, as they are not forbidden by law, but they are not under the careful supervision which Dr. Cameron's Bill will propose to extend to them.

Association of Municipal and Sanitary Engineers and Surveyors.—A meeting for the Northern District will be held at South Shields this Saturday, the 10th inst., when the following papers will be read and discussed:—"Recent Street Improvements in South Shields," by Mr. Matthew Hall, C.E., Borough Surveyor, South Shields; "Hospital Construction," by Mr. A. Campbell Munro, M.B., Medical Officer of Health, South Shields. The members will afterwards visit (under the guidance of Mr. Hall) the extensive street improvements recently executed; the Tramway and Corporation Stables; the new Infectious Diseases Hospital; and the Marsden quarries.

Weston-super-Mare.—At a largely-attended public meeting at Weston-super-Mare, a resolution was unanimously passed in favour of a scheme for a pier over a mile in length, at an estimated cost of 80,000l.

The St. Clare Estate, Walmer.—W. & T. Denne beg to thank the fifty-three competitors for their designs. The committee have awarded the premiums to the following gentlemen, viz., 1st, Mr. W. Pope, (Antiquary); 2nd, Mr. A. J. Style (Cross and Circle); 3rd, Messrs. Unill & Hodgkinson (Invicta).

Giff to Sheffield.—The Sheffield Town Council have formally accepted the gift of the late Mr. J. Newton Mappin of a collection of pictures valued at 80,000l.

TENDERS.

For alterations and additions to the Richmond Workhouse, Surrey. Mr. Edward Maynard, architect, Westminster. Quantities supplied:—

Kent Bros.	£5,780 17 11
Mages & Co.	5,149 13 6
Lucas & Son	4,845 0 0
J. Longley	4,777 0 0
Sweet & Loder	4,787 0 0
Oldridge & Sons	4,736 10 0
Carless & Co.	4,653 0 0
J. H. Jarvis	4,648 0 8
J. & W. Hickinbotham	4,575 0 8
C. Maton	4,500 0 0
Priestley & Gurney	4,400 0 0
D. & A. Brown	4,339 0 0
Howell & Son (accepted)	4,309 0 0

For taking down and rebuilding Crowle Vicarage House, near Worcester, for the Rev. J. Stephenson. Messrs. Henry Roe & Sons, architects, Worcester:—

J. Inwood, Malvern (accepted)	£1,200 0 0
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For foundations for new premises and machinery for Messrs. Rowe Bros. & Co., at Cas-on's-mars, Bristol. Mr. Herbert J. Jones, architect, Bristol:—

James	£1,700 0 0
Stephens & Bastow	1,503 0 0
Humphreys	1,482 17 4
Rossiter	1,467 0 0
Brook & Bruce	1,440 0 0
Eastbrook & Sons	1,429 0 0
Cowlin & Son	1,385 0 0
Lewis	1,354 0 0
Bevau	1,323 13 0
Hatherly	1,297 0 0
Davis	1,290 0 0
Crocker	1,259 0 0
Walters	1,200 0 0
Church	1,185 0 0
Howell & Son, Bristol & London	1,100 0 0

For rebuilding No. 22, Castle-street, Hastings, for Mr. T. Wallis. Mr. Arthur Wells, architect, Hastings:—

F. Ayle, Hastings	£446 0 0
W. J. Rodda, Hastings	435 0 0
C. & E. Harman, Hastings	411 18 0
A. H. White	410 0 0
J. Howell & Son, Hastings (accepted)	395 0 0

For building gate lodge at Old Roar, near Hastings, for the Executors of the late George Clement. Mr. Arthur Wall, architect:—

Alfred King, Hollington (accepted)	£204 10 0
[No competition.]	

For footpath improvements on Church-hill and Broomfield-road, for the Beckenham Local Board. Mr. Geo. B. Carlton, engineer and surveyor:—

T. W. Jones, Beckenham	£1,015 0 0
E. & W. Iles, Wimbledon	983 0 0
Wheeler & Hindle, Bankside	933 0 0
G. B. Marshall, Brighton	886 0 0
[Engineer's estimate, £956 7s. 0d.]	

For the erection of fire-escape staircase at the Southall school, for the Guardians of the Poor of the Parish of St. Marylebone. Messrs. H. Saxon Snell & Son, architects:—

Wm. Bamford, London	£230 0 0
Wm. P. Woodbridge, Maidenhead	298 0 0
Wall Bros., London	249 0 0
G. Gibson, Southall	235 0 0

For the erection of fire-escape staircase at the Fulham-road workhouse, for the Guardians of the Poor of the St. George's Union. Mr. H. Saxon Snell, architect:—

C. Batchelder	£284 0 0
Charles Wall	268 0 0
Wm. Bamford	240 0 0

For the erection of an iron bridge between men's and women's dormitories of the Fulham-road workhouse, for the Guardians of the Poor of the St. George's Union. Mr. H. Saxon Snell, architect:—

C. Batchelder	£236 0 0
Fraser & Co.	195 0 0
Edmund Toms	185 0 0
Jukes, Condon, Stokes, & Co.	175 0 0
Charles Wall	168 0 0
Wm. Bamford	150 0 0
Benham & Sons	148 0 0
May Bros.	138 0 0
Potter & Sons	130 0 0

For erection of forty horse-boxes at Kempton Park Racecourse:—

G. Gibson	£1,673 0 0
G. Reavell	1,630 0 0
W. Watson	1,460 0 0
W. Cullingham	1,540 0 0
A. Bushell	1,530 0 0
B. Cook	1,465 0 0
W. Goldham (accepted)	1,420 0 0
W. Lane	1,390 0 0

For revolving shutters for tramway sheds, Darlington:—

J. Stones, Ulverston (accepted)	£173 0 0
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For alterations and additions to farm buildings at Armitage Arms, Clifton, near Brighouse, for Sir George Armitage, Bart. Mr. R. F. Rogerson, architect, Brighouse:—

Masons.	
Matthew Mortimer, Moor Side, Cleckheaton	£219 10 0
John Cross & Son, Brighouse	212 10 0
John Bottomley, Brighouse	196 0 0
A. Drake, Hartshead	169 0 0
Charles Fearnley, Brighouse	168 10 0

Joiners.	
Thomas Bottomley, Brighouse	143 0 0
John Hirst, Clifton	139 19 0
J. Speight, Scholes, Cleckheaton	138 9 0
Benjamin Sykes & Sons, Brighouse	137 0 0
Job Crowther, Brighouse	136 0 0

Accepted.

For additions to a house at Guernsey, Mr. Newton, architect. Quantities supplied by Messrs. Palmer & Russell:—
 Stephens & Bastow £14,738 0 0
 Bangs & Co. 14,892 0 0
 Maiden & Harper 15,735 0 0
 Foster & Dicksee 10,410 0 0

For alterations and additions to the Canterbury Theatre of Varieties, Westminster Bridge-road, Mr. Frank Matcham, architect, Rugby Chambers, Bedford-row. Quantities by Mr. F. Thomson:—
 Dove Bros. £2,165 0 0
 Patman & Rotheringham 2,028 0 0
 Wall Bros. 2,025 0 0
 Bangs & Co. 1,062 0 0
 Mark Patrick & Son 1,869 0 0
 Toms 1,878 0 0
 Shurmer 1,710 0 0
 Ford & Everett 1,585 0 0

[Corrected list, in lieu of the list inserted a fortnight ago.]
 For a new warehouse to be built in the rear of No. 362, Edgware-road, for Mr. J. J. Thomas, Mr. Robert J. Worley, architect. Quantities by Mr. E. C. Glead:—
 J. Saunders £1,389 0 0
 Ellis & Turner 1,980 0 0
 Draid 1,880 0 0
 Marks 1,915 0 0
 Turtle & Appleton 1,545 0 0
 G. Green 1,497 0 0
 W. Smith 1,463 0 0
 B. Lawrence & Sons 1,463 0 0

For constructing the Hury Reservoir, for the Stockton and Middlebrough Corporation Water Board, Mr. D. D. Wilson, engineer:—
 G. Stevenson, Easington £212,335 8 21
 R. Simpson, Preston 143,667 16 3
 Whitaker Bros. Leeds 135,209 8 1
 Walter Scott & Co., Newcastle 112,658 7 8
 Crabtree Bros., Oxenhope 110,201 5 10
 S. & W. Fatkinson, Ruskington 100,035 6 2
 J. Johnson & Son, Middlesbrough 98,715 0 8
 S. Pearson & Son, Bradford 98,387 1 3
 Kellett & Bentley, London 96,250 0 0
 J. Schofield, Dewsbury 97,167 7 61
 [Engineer's estimate, 119,850*l.*, 8*s.*, 7*d.*]
 * Accepted.

For wood-paving, King-street, Great Yarmouth, for the Corporation. Mr. J. Wm. Cockrell, Borough Surveyor:—
 W. Hurst, London £2,950 0 01
 J. F. W. Bray, Yarmouth 1,438 0 0
 Improved Wood-Paving Company, London 1,410 0 0
 Hayward, Eastbourne 1,291 17 6
 Duffy & Son, London 1,160 0 0
 Cork & Beech, Yarmouth 1,100 0 0
 Nudd, Yarmouth 1,067 0 0
 J. Batch, Norwich (accepted) 863 0 01
 [Surveyor's estimate, 1,475*l.*]

For the completion of three houses and one shop adjoining the Elephant and Castle, Victoria Park, for Mr. R. E. Clarke. Messrs. Victoria Park, surveyors:—
 Wood £1,159 0 01
 Metcalf 875 0 0
 Jolley 818 0 0
 Bray (accepted) 935 0 8
 Perches 839 0 0
 Muncey 819 0 01

For the erection of a house in Derby-road, Bournemouth, for Mr. J. Dean. Messrs. Kemp-Waich & Pinder, architects:—
 Jenkins & Son (accepted) £2,970 0 0

For the erection of the Railway Mission Hall, and alterations to house adjoining, in Kensal-road, Westbourne Park, for the committee. Mr. R. H. Hill, architect:—
 The Building, Fitting, and Furnishing Company, City-road £985 0 0
 Oldrey, Kensal-road 875 0 0
 Holland, Poplar 894 0 0
 Harris & Wardrop, Limehouse 850 0 0
 Holiday & Greenwood, Loughborough Junction 837 0 0
 * Joly & Sons, Victoria Park 792 0 0
 Allen & Son, Kilburn (accepted) 757 0 0
 * Too late.

For interior fittings in teak wood for the National Bank of Wales, Swansea. Mr. J. Buckley Wilson, architect, Swansea:—
 Thomas, Watkins, & Jenkins, Swansea (accepted) £181 0 0

For the execution of ale store and works below ground line of new 120 quarter malting at The Brewery, Faversham, Kent, for Messrs. W. E. & L. Ridden. Mr. Richard White, architect, Duffield, Derby. Quantities supplied:—
 A. J. Smith, Stratford £1,321 0 0
 T. Ames, Birmingham 1,173 0 0
 Foster & Dicksee, Rugby 1,160 0 0
 R. Farnor & Sons, Margate 1,100 0 0
 H. Spencer, Luton 1,097 0 0
 H. Stiff, Dover 1,082 0 0
 R. M. & H. Whiting, Faversham 1,041 0 0
 W. J. Wiles, Dover 997 0 0
 M. J. Welch, Dover 890 0 0
 Howland Bros., Ashford 890 0 0
 T. Cornelius, Whitstable 989 0 0
 G. H. Deane, Deal 987 0 0
 R. G. Batley, Old Kent-road 979 0 0
 Wallis & Clements, Maidstone 870 0 0
 L. Shrubsole, Faversham (accepted) 849 0 0

New Town-hall, Eastbourne.—In the list of tenders printed by us last week (p. 219), the amount of Messrs. Avar's tender should have been £34,500, instead of £34,000, and that of Messrs. Binnett £24,050 instead of £24,000. Messrs. Dore & Son's tender, amounting to £28,475, has been accepted. The quantities were supplied by Mr. W. A. Phipson, of Birmingham. We printed the list as received.

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

H. S. (all correspondence ought to be accompanied by name and address of writer, whether for publication or not. We have had to decline several letters on account of any kind of subscription.)—H. W. (ditto)—Believe next week—M. U. (too late for this week).—B. W.—H. M.—B. L.—W. R. (next week).
 Correspondents should address the Editor, and not the Publisher, except in cases of business.
 All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
 We are compelled to decline pointing out books and giving addresses.
 Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.
 We cannot undertake to return rejected communications.
 Letters or communications (beyond mere news items) which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 12, and a COLOURED TITLE-PAGE was issued the following week, in substitution for that published previously.
 CLOTH CASES for Binding the Numbers are now ready, price 2*s.* 6*d.* each; also
 READING-CASES (cloth, with string, to hold a Month's Numbers, price 2*s.* 6*d.* each; also
 THE FORTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.
 SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 2*s.* 6*d.* each.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY morning.

PERSONS Awaiting in "The Builder" may have *Reprints* addressed to the Office, 46, Catherine-street, Covent-garden, W.C., free of charge. Letters will be forwarded if addressed direct, or are sent, together with sufficient stamps to pay the postage.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.
 The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.
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N.B.—For Prospectuses and Diagrams, address Stamped Envelope to

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NOTICE.—The POLYGONAL REFLECTOR (Latest Patent) FOR ARTISTIC AND PICTURE GALLERIES.
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The Builder.

Vol. XLVI. No. 2142.

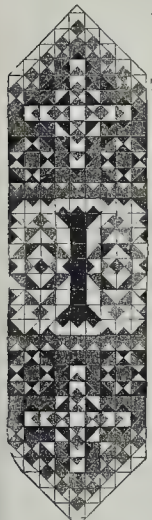
SATURDAY, FEBRUARY 23, 1894.

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Building Disputes Five Centuries Ago, and Later.

It is generally supposed that combinations and "strikes" on the part of workmen against masters or employers of labour are of very modern introduction. Without going back in search of precedents in early Greece and Rome, or other nations of antiquity, to prove that building and other workmen always had certain grievances to complain of, and adopted means for redressing them, we will confine our examples to our own country of five centuries ago, and later. History has been continually repeating itself for several centuries in

the disputes between workmen and their masters. Sundry of the causes that led skilled workmen to revolt and leave their work several centuries since were similar to those that obtain in our own time, but the chief cause appears to have been always a desire of bettering their condition or increasing their pay. Masters in the Middle Ages in London, as well as in the nineteenth century, were prone to the practice of enticing good workmen from other masters for their own advantage; and building hands have withdrawn themselves from Government works without notice, to enter the employment of city and country masters. Although the old trade guilds enforced penalties against any master-workman found enticing another's hands, the practice nevertheless continued. Human nature in all ages has been much the same. A master finding himself short of hands, and busy, held out the inducement of higher wages or constant work for a stated period, and the workmen of old as well as their successors, were not slow to avail themselves of such offers. In the 27th year of Edward III. (1353) many building workmen and labourers who were retained or employed upon the works at the Palace of Westminster withdrew from their employment. The action of the workmen led to the issue of a royal mandate or proclamation, intended as a warning to the deserters, and those who employed them, of the penalties they incurred. The mandate speaks of the hands that had "been received to work for divers men of the city and county [Middlesex] afore-

said, within the same city and county, as we have been given to understand, in contempt of us, and to the damage and manifest retardation of our works aforesaid." After impressing upon the sheriffs of London and Middlesex their duty in causing the proclamation to be made far and wide, the royal mandate goes on to say: "that any one shall, on pain of imprisonment of his body at our will, and of grievous forfeiture unto ourselves, receive any such workmen upon his works, of whatsoever calling they may be, who shall have been before retained upon our works aforesaid (unless they shall have leave to depart therefrom), or in any way retain the same. And if, after the proclamation and prohibition aforesaid, you shall find any such workmen who have been before retained in our service, and have not had leave to depart therefrom, received upon the works of other persons of the city and county aforesaid, then you are to cause as well such workmen or their receivers to be taken, and the workmen to be brought back to our palace aforesaid, there to be set upon such our work; and the receiver of them to be sent to the Tower of London without delay, there in prison at our will to remain as before mentioned. And this you are in no way to omit." We do not learn in any subsequent civic records how far the sheriffs of London had been successful in their quest, how many deserters were brought back to the king's works, or if any builders in the city who acted as receivers had to go to expiate their offences in the Tower. The mandate of Edward III. was quite as severe against workmen as the Old Combination Laws, which were partially repealed in the 5th and 6th of George IV., and which Acts made it penal for workmen either to combine to raise their wages or to oppose their reduction. Of course at present (as for several years past) workmen may combine as much as they like to raise their wages or resist their reduction. Indeed, they may do much more by a system of strong moral suasion, or "picketing." So long as workmen do not use physical force they are within the pale of the law. The system of picketing is not altogether a modern practice, but the operation is mild compared with some of the physical manifestations in the earlier part of this century, even when the Combination Laws were in full force.

In the 30th year of Edward III. (1356), in consequence of the constant disputes occurring between the two classes of masons in the building trade, the hewers and the light masons or setters, it was found necessary to frame a number of "regulations" for the trade. At a meeting of the mayor and aldermen of the City twelve

of the most skilful men of the Masons' Guild appeared to represent their respective branches, six on each side. The agreement come to appears very fair, considered with a view to the exclusive practices of the period. Among the "regulations" are the following:—"That no one shall work in gross [wholesale or by contract] if he be not of ability in a proper manner to complete such work, and he who wishes to undertake such work in gross shall come to the good man of whom he has taken such work to do, and complete, and shall bring with him six or four ancient men of his trade, sworn thereunto, if they are prepared to testify unto the good man of whom he has taken such work to do, that he is skilful and of ability to perform such work, and that if he shall fail to complete such work in due manner, or not be of ability to do the same, they themselves, who so testify that he is skilful and of ability to finish the work, are bound to complete the same work well and properly at their own charges, in such manner as he undertook, in case the employer who owns the work shall have fully paid the workman [meaning the contractor]. And if the employer shall then owe him anything, let him pay it to the persons who have so undertaken for him to complete such work." It is somewhat curious, after the lapse of five centuries, to find the old feud between the two sections of the masons' trade, the hewers and the light masons and setters, cropping up in our own time. Within the last quarter of a century in London there have been violent disputes between the masons who cut and dress the chief stones and moulded work, and those who lay the wall courses generally, as to whose right it was to set the stones or certain of them *in situ*. The claims of building and other workmen, particularly those of a peculiar and minor kind, have had to give way to the exigencies of modern building contracts. The terms of reconciliation of two master-masons who quarrelled in the City in the 26th of Edward I. (1298), and made use of certain abusive words, comes down to us in Latin in the civic records. These two worthies were respectively named Master Simon de Pabingham and Master Richard de Wetham. Of course they were reconciled as usual before the mayor and aldermen of the day, and the agreement was to the following effect:—"That the said Simon and Richard did grant each for himself, that if either of them should be able to give information against each other, that he had by the same abusive words or in deed committed trespass against the other, and such person should, upon the faith of two trustworthy witnesses, be found guilty thereof, he should give 100s. towards the fabric of London Bridge, and they further agreed that in case such person

should not do so, the Chamberlain should cause the same amount to be levied, &c. Nearly five centuries and a half later on, in 1841, certain abusive words and alleged foul expletives on the part of a foreman mason at Westminster, when the new Houses of Parliament were building, led to a prolonged masons' strike, extending over six or seven months. The foreman, it appears, was somewhat exacting, if not tyrannical, and the workmen and himself could not agree. The masons employed in a body demanded his discharge, but the contractors, Messrs. Grissell & Peto, refused to comply with the masons' request; hence the strike. A series of circumstantial charges, some of a very grave character, were brought against the foreman, and eventually the accused replied to some of them through a letter in the *Times*. Several meetings were held by the workmen, and an inquiry was held into the truth of the charges advanced against the foreman, and the masons believed they proved their case. The masons' body withdrew their men from other contracts that were being carried out by Messrs. Grissell & Peto, and the work at the new Houses of Parliament, as well as elsewhere, was considerably retarded. In a statement made on behalf of the masons in April, 1842, when the strike had extended over the long period of thirty-two weeks, it was said that out of above 400 hands who had struck, 84 remained on the funds altogether, and only 32 of those who turned out at the Houses of Parliament and the Nelson Monument. A few weeks later all the turn-outs had found employment elsewhere. We may mention here that the Government, in consequence of the strike, enlarged for the contractors the time that the contract was to run. This strike of 1841 was small compared with the general London building strike of 1859, that eventually led to the adoption of the hour system, and the strike of 1872. Of these later disputes we do not intend to give any particulars, and we only cite that of 1841 for its historical relevancy to matters mentioned previously.

There were many disputes among building and other workmen in reference to trade matters in the fourteenth century, and the three following are of historical interest. In the reign of Edward II. there were disputes between the joiners and painters on the one hand, and the saddlers on the other, and in the 1st of Edward III. (1327) there was an agreement come to for the settlement of their feuds. Certain malpractices of the saddlers were alleged in the plaint of the joiners, painters, loriners in copper, and loriners in iron. Large sums of money were said to be due by the saddlers to the other trades, which the former not only refused to pay, but, in addition to maltreating members of the latter trades, made use also of abusive language. The agreement, including the recital of the grievances on either side, is a lengthy document in Norman French. It is mentioned near the end of the agreement arrived at before the mayor and aldermen, "that these ordinances and grants shall hold good and be valid, as well against the saddlers aforesaid as the joiners, loriners, and painters before mentioned; they shall be enrolled in the hustings at London, for ever to endure, and also in the paper of the chamber of the Guildhall aforesaid." Alas! human laws and institutions are like the vanity of human wishes, often of a very short duration. Royal mandates, legislative enactments, and civic ordinances alike, are submerged by the rolling waves of time. The older the world grows the more difficult it becomes for statesmen to legislate safely even a half a century in advance of their time.

"The falchion's blade may shiver,
Stone walls in time will sever:
'Tis mind alone, worth steel and stone,
Which makes men free for ever."

Of a verity it is, but the mind or knowledge that constitutes power must have truth for its foundation. Strikes, or disputes in trade leading to them, have not yet ceased; but our workmen and employers have grown more conscious of the magnitude of the evils that result from their operation. Mere disputes or differences of opinion will always, more or less,

exist while the world lasts. In the industrial world men are learning, through the wisdom of experience, how to adjust their disputes by rational conferences, instead of resorting to methods that spell bankruptcy or ruin and beggary on either side. A strike *per se* may not be wrong, and there may be such a thing as a justifiable strike. Against ignorance, bad building and workmanship, let our masters and workmen strike amain, and education, health, and skilled labour will score a great victory for the nation.

THE STRAINS IN FRAMED STRUCTURES.

THE work published under this title,* by a distinguished American engineer, is the most comprehensive treatise on the application of graphic and analytic statics to iron structures which we have yet met with, and must prove a most valuable text-book both to the civil engineer in designing metal structures, and to the student. Du Bois's works are already well known and appreciated. His definitions and axioms are always models of clearness and precision. It has evidently been to him a labour of love to make his present work as complete as possible. Almost every conceivable form of iron roof-truss is treated graphically in a series of plates sufficiently large to indicate clearly the construction of the force polygons; though to make use of them practically it will be found necessary to re-draw them to a much larger scale. The work is so complete for iron structures, and such a model of clearness and precision, that it is a pleasure to follow the author through the unavoidable intricacies of the subject. His definition of shearing force, and his deductions therefrom, are particularly worthy of attention, as this subject has proved a stumbling-block to so many writers. The author is indebted to Professor Alexander, of Japan, for his valuable solutions with reference to the maximum strains produced on girders by moving loads, to which we have already had occasion to draw attention; and to the experimental researches of Wohler and Spangenberg for the effects produced by intermittent strains. In fact, all the most recent additions to our knowledge of the subject from every source are embodied in this work. The chapter on compound structures which involve the consideration of relative extensions is admirably written, although the theory of flexure may be open to criticism; and the excellence of the letter-press illustrations and general appearance of the work is on a par with the excellence of the subject-matter contained in it.

Notwithstanding the great excellence of this work, we must take exception to some of the principles advanced, and think it will be of great advantage to the student as well as to future writers on the subject to point out these matters, especially as the same errors exist in all works we have hitherto met with which treat on these particular subjects.

First, then, with respect to the braced arch or arched rib, continuous at the crown and under the influence of a pressure which depends upon its lateral strength to resist the stress, the author asserts "that the resultant pressures do not pass through the ends of the arch when they abut on the skewbacks, but that they are tangent to a hyperbolic arc within the arch and pass below the abutments." Assuming that the ends are buried in the masonry or otherwise rigidly secured in direction at these points—that is, that the tangents there cannot rotate—the thrusts might not, and, probably, would not, pass through the skewbacks, as the ends of the arch would then, to some extent, act as cantilevers; but in that case they would pass above, not below, the abutments as he shows them. In the following observations space will allow little more than to point out

the principles involved, leaving much of the detail to be filled in by the intelligent reader, and care will be taken to avoid, as far as possible, intricate mathematical investigations. There are three methods of solution. Firstly, the directions of the thrusts may be determined as those which give the minimum amount of deflection to the arcs; secondly, they may be found by use of the theory of moments; and, thirdly, by considering the revolutions of the tangents combined with the theory of deflection. These three methods give precisely similar results. The last, which is here given, is, however, by far the simplest. First take the case where the arch is continuous at the crown and has its ends resting freely on the abutments.

Let A B C D, fig. 1, represent any uniformly

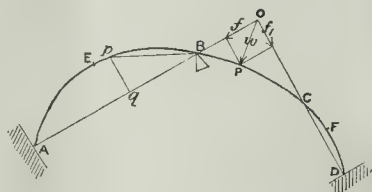


Fig. 1.

elastic curved lamina acted upon by a force w at P, with its ends resting freely on smooth surfaces at right angles to the directions of the thrusts, whatever those directions may be. The thrusts must necessarily pass through A and D and intersect on the line of force w , their magnitude being determined by the resolution of w in their respective directions. The general effect of the force is evidently to decrease the curvature at the crown B C, and increase the curvature at the flanks A B and C D. There are consequently two points, such as B and C, where the curvature remains unaltered. These are evidently the points where the thrusts f and f_1 , passing through A and D, intersect the curved lamina, for the curvature necessarily alters if the force passes outside the lamina. In fact, the lamina might be cut at B and C perpendicularly to the direction of the thrusts without affecting the conditions; the arcs A B and C D acting as bent struts, the arc B C as a bent lever. The forces intersect the arc somewhat in the manner indicated in the figure. The tangents at the points A, B, C, and D rotate in opposite directions, taken consecutively. Hence there are certain points between A and B, B and C, and C and D, where the tangents remain constant in direction. First consider the bent strut A B acted upon by two equal and opposite forces along its chord; and suppose E to be the point where the tangent remains constant in direction with respect to the chord. Imagine the point E and its tangent to become fixed in position and direction, and the ends A and B to move in consequence of the deflections of the arcs E A and E B. It is evident the motions of A and B perpendicular to the chord must be equal in amount. Now the motion of B due to the deflection of any short length of arc ds at p perpendicular to the chord $p B \sim ds \times p B \times p q$; $p q$ being the distance of the force f from the point p . Therefore by similar triangles the motion perpendicular to A B $\sim ds \times p q \times B q$. And the motion in the direction B A $\sim ds \times p q^2$. Or calling B A the axis of x and $p q$ the axis y , δ the total motion of B in the direction of the force in consequence of the deflection of every part of the arc E D, and δ_1 the corresponding total motion perpendicular to the force, and δ_2 the real deflection or the resultant of δ_1 and δ_2 . Then

$$\delta \sim \int ds y^2$$

$$\delta_1 \sim \int ds xy$$

$$\delta_2 = \sqrt{\delta^2 + \delta_1^2}$$

Hence the amount of deflection in an arc in the

* The Strains in Framed Structures, with numerous practical Applications to Cranes, Bridges, Roof and Suspension Trusses, Braced Arches, Pivot and Draw Spans, Continuous Girders, &c. By A. G. Du Bois, C.E., Ph.D., Professor of Dynamic Engineering, Yale College, &c. New York: John Wiley & Sons, London: Traubner & Co. 1883.

direction of the straining force varies as the moment of inertia of the arc round the line of force.

From the above expressions, if the equation to the curve be known the deflections may generally be obtained analytically. But whatever the curve may be they may be found graphically, thus:—

Draw an equilinear polygon (fig. 2) to repre-

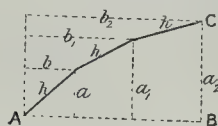


Fig. 2.

sent the curve; let $h, h, h, \&c.$, be the faces, $a_1, a_2, a_3, \&c.$, be the ordinates, $b_1, b_2, b_3, \&c.$, the abscissae.

Then we may easily find that the motion of A in the direction of the straining force A B \sim moment of inertia of the polygonal line A C about A B, or

$$\frac{1}{3} (2a^2 + 2a_1^2 + 2a_2^2 + a_3^2 + \dots + a_{n-1}^2 + a_n^2 + a_1 a_2 + \dots)$$

And the motion of A perpendicular to A B

$$\frac{1}{3} \left\{ 2ab + 2a_1 b_1 + 2a_2 b_2 + a_3 b_3 + \dots + \frac{1}{2} (ab_1 + ba_1 + a_1 b_2 + b_1 a_2 + a_2 b_3 + b_2 a_3 + \dots) \right\}$$

From this expression the positions of E and F may be determined.

Now the rotation of the tangent B through the deflection of the arc E B varies as its length multiplied by the distance of its centre of gravity from the straining force. Similarly for the rotation of the tangent at C due to the deflection of the arc F C. Since the tangents at E and F are constant in direction, the rotation of the tangent at B due to the deflection of the arc B P, by the force f_1 , together with the rotation of the tangent at C, due to the deflection of P C, by the force f_2 , must equal the sum of the rotations at the same points due to the deflection of the arcs E B and F C by the same forces f and f_1 . This equation is independent of any rotation that there may be in the tangent at P. The sum of the rotations of the tangents at B and C of the arcs P B and P C are measured similarly by their lengths, times the forces, times their distances from the centres of gravity of the arcs. A simpler equation may be deduced from the following corollaries:—

If there be no relative rotation of the tangents at the ends of an arc (as E and P) the force deflecting it passes through its centre of gravity.

But if the tangents at the ends have a relative rotation the magnitude of the rotation varies as the length of the arc, distance of its centre of gravity from the force, and magnitude of the force. Thus (fig. 1),

Arc E P $\times f \times$ distance of f from centre of gravity of E P = arc F P $\times f_1 \times$ distance of f_1 from centre of gravity of F P.

These are the general principles which determine the direction of the thrusts when the ends are free to slide on abutments perpendicular to the thrusts. The application of these principles to curves whose equations are known is generally not very difficult. In circular arcs the equations involving the deflections for the determination of the points E and F are unnecessary, as those points are situated half way between A B and C D.

Thus if the arc A B C D be circular and support a weight at the crown, arc A B is equal to arc C D, E and F bisect arcs A B and C D, and the thrusts pass through the centres of gravity of E P and F P. The stress may sometimes be in such a position and direction that one or other of the resultant thrusts does not intersect the curve. In such a case the curve should be extended so as to intersect the line of thrust. The above principles can then be applied.

When the ends of the arch are pivoted at A and D, instead of being allowed to slide freely

on the abutments, other strains are usually produced. The increase to the length of the chord B C through the deflection of the arc may be equal to, greater than, or less than, the increase in the distance between B and C, due to their motions towards A and D, caused by the deflection of the arcs A B and D C. If the increase be greater or less than the distance, the points B and C are no longer fixed points in the arch, but approach or recede so as to make up the difference. These differences can be easily estimated in any case by the laws of deflection of curved arcs already explained. The thrusts also will sometimes rotate to some extent round the pivoting points in consequence of a greater amount of deflection on one side of the arch than on the other. These rotations may also be easily ascertained for any special case by the same laws. Generally speaking, it is unnecessary to estimate the secondary strains, but in cases where the rise of the arch is relatively small in proportion to the span, it is sometimes necessary to take them into account.

If the ends of the elastic lamina be fixed in direction so that the tangents at A and K cannot rotate, the thrusts pass somewhat in the manner shown in the diagram (fig. 3). To elimi-

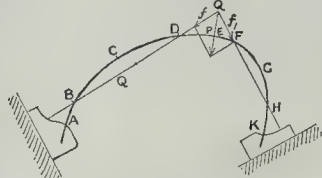


Fig. 3.

nate the secondary strains, suppose the ends be let into blocks which slide freely on surfaces at right angles to the directions of the thrusts. There are five points, A, C, E, G, and K, where the tangents do not rotate. The deflection of A B causes the tangent at B to rotate in the same direction and to the same extent as does the deflection of B C. Therefore, the thrust passes through the centre of gravity of the arc A C, and it cuts the curve at such a point, D, that the deflection of the arcs B C and C D, perpendicular to B D are equal. It also passes at such a distance, d , from the centre of gravity of the arc C P that $CP \times d \times f = GP \times d_1 \times f_1$, d_1 being the distance of the thrust f from the centre of gravity of the arc G P. The centres of gravity of the arcs C P and G P falling always on the same side of the corresponding thrusts.

These are the general principles which determine the directions of the thrusts when the ends are fixed. When the curve is irregular, mathematical expressions cannot be obtained, though the graphic solutions are always sufficiently simple. The centre of gravity of any curved line may be determined with sufficient accuracy by dividing it into a number of small arcs which differ insensibly from their chords, choosing any convenient power of 2 to represent their number, as 4, 8, 16, 32, &c., and combining them together in groups, first of 2, secondly of 4, thirdly of 8, &c. The same divisions of the arc will give its length with sufficient accuracy.

Thus, to find the resultant thrusts in any curved rib whose feet are fixed in direction. Assume such directions as appear reasonable, meeting in the line of the straining force. Find the positions of C and G (fig. 3) so that f passes through the centre of gravity of the arc A C and f_1 of the arc K G. The point of intersection D should be so situated that the deflection of the arc C D is equal to the deflection of the arc B C, perpendicular to the force. If it do not satisfy these conditions alter its direction so as to do so. So also with regard to f_1 ; and finally, if δ and δ_1 be the distances of the thrusts f and f_1 from the centres of gravity of the arcs C P and G P,

$$f \times \text{arc CP} \times \delta \text{ must equal } f_1 \times \text{GP} \times \delta_1.$$

When the arc is a known curve, as the ellipse, parabola, or catenary, the formulae, though complex, may be mathematically ex-

pressed. The circular arc is very simple. Thus, if a circular arc support a weight at its crown, the thrusts pass through the centres of gravity of the arcs A P and K P, parallel to their chords.

When the ends A and K are not allowed to slide freely on surfaces perpendicular to the thrusts, secondary strains are introduced, as in the former case, when the ends are carried on fixed pivots. These strains should sometimes be taken into account. Heat strains are of a precisely similar nature, and may be determined on the same principles.

Another error of principle which is common to this and other works is the assumption that the neutral axis of a beam under transverse strain passes through the centre of gravity of the cross section. This assumption is correct only when the horizontal line through the centre of gravity divides the section symmetrically; it is inaccurate when the line does not do so, but passes closer to the bottom or to the top. Neither is it correct to assume that the moments of inertia of the sections above and below the centre of gravity represent always the moments of resistance. Where the neutral axis is not at the half depth the matter at the further extremity from it is strained up to its elastic limit before the matter at the nearer is so affected. The moments of inertia require, therefore, to be divided by the greatest distance of any part of the cross section from the neutral axis before they properly represent the moments of resistance to deflection. The position of the neutral axis may be determined analytically in many cases. In the familiar example of a bar of triangular section, Du Bois, in common with others, assumes that the neutral axis passes through the centre of gravity of the section, i.e., at $\frac{2}{3}$ the depth from the apex. Now, the strain at any depth is proportional to the horizontal diameter there and to its distance from the neutral axis. Therefore the moment of resistance round the axis is proportional to the diameter multiplied by the square of its distance from the neutral axis. Hence the sum of the moments of resistance above and below the axis are proportional to the moments of inertia of the areas above and below. Therefore the neutral axis must be in such a position that the moments of inertia of the sectional areas on each side of it may be equal; not the moments of weight, as would be the case if the neutral axis passed through the centre of gravity. In the example before us (fig. 4) let the angle at the apex be 90. Let a be

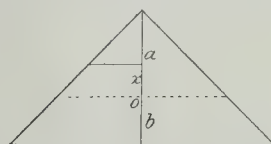


Fig. 4.

the distance of the neutral axis from the apex, and b its distance from the base. Take o as the origin, and let x represent any vertical distance from o . Then for the moment of inertia m of the area above the axis—

$$m = \int_a^o 2(a-x) \cdot x dx = \frac{2a x^2}{2} - \frac{x^3}{3} = \frac{a^3}{6}$$

For the moment of inertia m_1 of the area below the axis—

$$m_1 = \int_b^o 2(a+x) x dx = \frac{2a x^2}{2} + \frac{x^3}{3} = \frac{4}{3} a b^2 + 3b^3 = a^4$$

If therefore $b=1$, $4a+3=a^4$, and $a=1.7844$ instead of 2 as usually assumed, in this instance there is an error of $12\frac{1}{2}$ per cent. in excess of the elastic strength.

Although the moments of resistance vary as the moments of inertia, the latter require to be divided by the maximum distance of any of the matter in the cross-section, and multiplied by the elastic strength per unit of area to represent completely the moments of resis-

"lurking volcano," but gas at all events warns us unmistakably of its escape by its smell, whereas there is no warning of the escape of electricity into wrong channels, save through the diminished brilliancy of the light; and this may, in some cases, be very slight, and how many people of average intelligence,—servants in houses, especially,—would be likely to give due and immediate heed to this? We certainly should not think that Mr. Hedges's paper would be likely to have the effect which he suggests, of inducing insurance companies to lower the premiums on all buildings from which gas is excluded, regarding electricity as the alternative. On the whole, we should regard it as fortunate that the mechanical and commercial difficulties in the way of general lighting by electricity are likely to postpone its adoption until we have had time to develop more complete means of controlling this powerful agency, which it is proposed to domesticate among us.

THE closing-up from view, for some time past, of Hardwick's colossal Doric portico of the London and North-Western Railway by the new hotel buildings which have been extended in front of it, takes away from the approach to the station a certain grandeur and effectiveness which this massive work imparted to it. Very trivial are the small burrows under the hotel, with their neat columns, in comparison. It is now rumoured that further alterations may necessitate the removal of the portico from its present position altogether. If so, we hope it may be set up again in some important position where it will have a meaning. It is true that the lintels are a terrible sham, being cramped together owing to the impossibility of getting homogeneous masses of stone to bear over the large openings. But the scale and style of the portico showed at least this, that its architect appreciated the fact that this was the access to a great system of travelling roads, the importance of which to the country could hardly be over-rated; and he determined that it should have a gateway commensurate in scale and mass. Something less rigid than a Doric order might have been more manageable; but it was, at any rate, the attempt to do something large and dignified purely for the sake of largeness and dignity,—an attempt we seldom see made now in such matters.

THE Royal Institute of Painters in Water-Colours, at a general meeting of members summoned on Wednesday last, in consequence of the resignation of Mr. Louis Haghe, who has for many years been president of the Society, elected Mr. J. D. Linton as their president. They could hardly have done otherwise, for in the highest branch of painting, that which deals with the figure, Mr. Linton is *facile princeps* in their ranks, and for some time past his remarkable drawings were among the few which kept alive the interest of the exhibitions of the Institute during the latter years of its sojourn in the old quarters in Pall Mall. We have felt regret, however, that in some of Mr. Linton's later productions the element of executive power was more predominant than that of interest and pathetic power, in regard to subject and treatment, which characterised some of his earlier works. We venture to hope he will keep in mind what he used to lead us to expect from him in this respect.

LAST week the distribution of prizes in the Liverpool Government School of Art took place, being the first public gathering in the new premises in Mount-street. From the report of the meeting in a local paper, the school seems to be in an active and flourishing condition; it possesses in Mr. Finnie an able and competent head-master. Part of the report of the proceedings, however, again suggests what we have commented on before in regard to the Government Schools of Art in this country,—the broad-cast manner in which prizes and certificates are thrown about. From the report we gather that the average number of students presenting themselves for examination in the "second grade" is about 230, or a little over; and we see about forty names of

recipients of "second grade prizes," and over 120 of "second grade certificates." At this rate it will soon become the most distinctive result *not* to have obtained a prize.

As the work at Peterborough proceeds, the necessity for thoroughly investigating and making good the foundations of other portions besides those at first threatened, becomes apparent, and the walls and staircases of the transepts are showing signs of the insufficient and treacherous character of their footings. These and other similar discoveries in Mediæval buildings are interesting, as showing how little connexion there may sometimes be between architectural genius and aspiration in the artistic direction, and practical knowledge and perception of the conditions of sound building. In this respect it would seem that we want the thirteenth and the nineteenth centuries rolled into one. The Mediæval builders erected beautiful and poetic fabrics, which were almost literally in many cases houses built on sand, and stood by a kind of interposition of Providence. We can now make first-rate foundations, which would be immovable for centuries, but alas! we have little worth putting on them.

We commend to the attention of architects and those who are desirous to employ the services of architects in building residences for beauty as well as for fitness, the glowing list of various-coloured marbles available for the artist-architect which is tabulated in the portion of Mr. Aitchison's Royal Academy Lecture which we print elsewhere. Constructive polychromy is the most satisfactory of all to the architectural mind, since it is the most durable, and it is built up, instead of being laid on, in a manner in harmony with the whole ideal of what architecture is,—a construction of solid materials, put together so as to combine into one design. We do not wonder that Mr. Aitchison, having familiarised himself specially with the beautiful and various founts of colour which marble supplies, should grow eloquent on the subject. We heartily wish his feelings may find a practical response among some of those who might, could, and should glorify their structures with colour, and are content to leave them as cold and grey as Mr. Ruskin's sky of the nineteenth century.

ON Tuesday, the 19th inst., the third night of the debate on Mr. Conder's paper on "Speed on Canals" was occupied by a very lively discussion. Twenty-two speakers have taken part in the three debates, and the interest excited has been sustained and very great. In addition to the central subject of the paper, the scientific relations that obtain between the size and form of water-way, the size and form of vessels, and the attainable speed, much information was contributed by several speakers as to the state, the capacity, and the cost of the Suez Canal,—the latter having expanded from the original estimate of 64,800*l.* per mile, to the cost, to the end of 1882, of 143,500*l.* per mile for works, and 56,500*l.* per mile for management, finance, and interest paid out of capital. So much anxiety was shown to address the Institution that the utmost time available was exhausted, and Mr. Conder was thus prevented from giving his reply upon the whole case, which he will do in the usual mode through the secretary. The paper and debate, illustrated by drawings and diagrams, will appear in vol. lxxvi. of the Proceedings of the Institution.

Birmingham Architectural Association.—An ordinary meeting of this Association was held at Queen's College on Tuesday, the 12th inst., under the presidency of Mr. J. Cotton. Messrs. W. Hawley Lloyd and W. Tadmor Foulkes were elected honorary members, and one other gentleman was proposed for membership. A paper was read by Mr. J. Spencer Swann on "The Influence of Literature on Art." A discussion and a vote of thanks followed, in which Messrs. H. H. McConnal, V. Scruton, T. W. F. Newton, and Franklin Cross, hon. sec., joined.

FOUR NORMANDY TOWNS.

ONE of the greatest of our historians of the present day tells us that the Englishman feels nowhere so much at home on the Continent as in Normandy. Apart from the near kinship which we bear our neighbours of the North of France, apart from the similarity of the *Jacques Bonhomme* of those parts with the English peasant of Hampshire, Sussex, and Kent, the towns of Normandy have something particularly attractive to Englishmen. Long ere he visits them does the English traveller read of them when a boy in his history-book; long ere he assails their "sights" with his guide-book, has he helped in imagination to besiege them with Richard the Lion-hearted, to incite them to revolt with the perfidious Philip Augustus, or to enter them in triumph with the terrible Conqueror, William. He may still, out of the love he bears to his history-book, visit them with delight, and if the historical reminiscences of his youth have been eliminated by the graver studies of maturity, he will not only see many things which will bring back to his recollection the years when he lived in the Middle Ages, but will be compensated by the contemplation of some of the most splendid specimens of art and architecture in France.

The beautiful town of Rouen is in truth only three quarters French,—at least, speaking historically; but the period in which the English relationship to Rouen stands out most prominently reflects little credit on us, for the principal thing connected with the English name at that time is the death of Joan of Arc. Her statue stands in one of the open spaces of the town, by no means a beautiful piece of work; indeed, had the Maid of Orleans been as unpossessing as she is represented there, she would never have been permitted to take Orleans, and the Bishop of Beauvais would certainly not have had the courage to burn her. Close by is the Hôtel du Bourghroude, an elegant house, or rather, palace, in the older part of which Joan of Arc was said to have been condemned to death. The later portions of this charming edifice are built round a courtyard, and three of the walls are most beautifully decorated with stone carving, representing the pageant of the Field of the Cloth of Gold. But alas! French spirit is as good at destroying as it is at creating, and the enthusiasts of the Revolution knocked off everything that related to royalty; the wreath of flowers is left, but the arms of the kings contained in it are gone; the cushion and stool are there, but the crown has been removed; the monarchs themselves are still to be seen on horseback, but they now will be recognised, not by their crowns, but by their being without their heads. In such a city as Rouen it is difficult to know which of the many beauties to review first, the Cathedral or the Museum, the Courts of Justice or the Church of St. Ouen, the Seine and its ships or the Hill of St. Catherine, the various little minor beauties or the town itself, a magnificent whole, as it lies nooked in a valley between a semicircle of hills and a bend of the Seine. To discuss each separately our limited space does not permit, so we must confine ourselves to those objects that leave behind them the most marked impressions. There are few European buildings that so impress the mind as the Cathedral. Drawn to it as by magnetism, by the beauty of its towers, which peep over the gabled roofs of the houses at all the most picturesque turns of the streets, apparently grouped on purpose for artists, we suddenly come upon the façade, one broad mass of sculpture and windows, with one grand central and two side portals of exquisite workmanship; while on the sides of the edifice are the two charming towers that harmonise in their irregularity,—one of these, so runs the tradition, being called the Tower of Butter, because built by the pennies which the priests ingeniously got from the people for permission to butter their bread in Lent. Be that as it may, and if nowadays we build our works on firmer foundations than those of butter, certain it is that to religious enthusiasm and an ennobling love for religious beauty, the town of Rouen,—nay, the whole of Mediæval France,—owes its grandest architecture. It would be difficult to find in another town of equal magnitude two such edifices as the Cathedral, and the Church of St. Ouen. By many the latter is preferred for its greater completeness and perfectness, its harmonious lightness and grace, to the more ponderous and varied grandeur of the

Cathedral; but as to the greater conception belongs the greater praise, so does the human genius, represented in so many architects and artists which produced the Cathedral, claim for that edifice a greater amount of veneration, if not of praise, than does the human genius which gave birth to the more consummate, though less imposing Church of St. Ouen. Scarcely inferior to St. Ouen is St. Maclou, whose gorgeous triple porch rises out of the dingy streets, more like the visionary creation in the mind of an architect, than a cold reality of stone and carving in the gloom of a Norman town—more like the fretted portal of the fane a poet might conceive in which to marry his heroine, than the lordly entrance unnoticed by the proxy priest, as he shuffles under it every morning to drone through his masses.

Parting from the lovely churches, there is still much to be seen that no description can do justice to,—much of which no idea can be formed till actually visited and studied. No one who carries away with him an airy, mental vision of the Palais de Justice would ever hesitatingly offer himself as an able and accurate describer of the beauty of that edifice, or dare to translate his impressions to paper. He would confess that as a piece of Norman Gothic it was certainly one of the most beautiful specimens of its kind; he would pronounce its carvings and frettings to be perfect in their airiness and delicacy; he would perhaps venture a few commonplace remarks on the softness of its shading and the grace of its proportions; and he would, no doubt, unwind many other little humdrum conventionalities of description, which to the unknowing reader might convey a very favourable impression as to the style of his writing, but not the very faintest impression of the beauty of the building he was writing about. Though the same does not exactly hold good with the other sights of Rouen, there are many things that a network of words and epithets can describe but with difficulty; portions of Rouen, like the Rue de l'Epicierie and Rue de la grosse Horloge, are not so difficult to conjure up, either mentally or verbally, as the Palais de Justice. Let the reader imagine before him the picture of a street, narrow and slightly curved; to the foreground are old gloomy houses, made of all conceivable things, that tend to add picturesque; coloured beams, ornamented signboards, patches of cement here, and portions of brick there, gabled roofs with little bits of iron-work on the top, rows of half-opened and partially-curtained windows, red tiles on the roofs, and old carved doorways, opening to a rickety street paved with cobble-stones and alive with the traffic of a market-day or a fête; then let him conceive a sudden burst of sunshine in the background at the end of the street, lighting up one of the side portals of the cathedral, which rises to the top of his picture, and looks like a fairy creation of pure white marble, curtained on either side with the quaint extravagances of Mediæval house architecture, and he has before him the Rue de l'Epicierie, the humble habitation of the grocers of Rouen. Let him imagine another picture, this time a double one, that is to say, a picture painted on both sides; each represents a street winding beneath a quaint and graceful archway, vaguely suggestive of our own Temple Bar. The archway on the one side is gloomy and shaded, while the sun shines brilliantly on the white and varied houses, discernible through the entrance, and behind the painted traffic of vehicles and passers-by. Then let him reverse the picture: all the sun-dazzle is on the face of the arched clock-tower, lighting up the golden hands of a huge time-piece in the centre, and catching the sparkles of water that flow from a pretty fountain, wrought in stone bas-relief, on the right-hand side of the archway; Alpheus at the stream head, with his urn, and Arethusa below. They are no more chiding, but now,—

"Like friends on a partod,
Grown single hearted,
They ply their watery tasks,"—

and, though a little grimed with age, still, when the sun shines on them, as delightful as ever, and of more service, no doubt, in giving water to the gossips of the Rue de la grosse Horloge, than they ever were on the Acroceraunian Mountains. But lingering in Rouen means lingering a very long time, and the Alpheus of space pursues, so that we must hasten to the Seine to take our last look of the fair town. A very good point lies a little higher up on one of the bends of the river. We catch the city side-

ways; the Seine, coiling along in front among the willows, "rolls her watery labyrinth" around the town; masts and sails of ships are mingled among the trees; before us is a row of hills, on one of which stands the Church of Notre Dame de Bon Secours; the hills stretch around the city and seem to bear it gently cushioned in a green bed, defending its stately spires from harm, and when evening comes, charming down the valley mists that slowly curtain it from our sight.

From Rouen to Caen is a step downwards in the ladder of beauty; but Caen is one of the representative towns of Normandy, and so shares, in proportion to its importance, a certain amount of our regard. Already, when we draw near it, we feel ourselves in an atmosphere in which lives the memory of William the Conqueror, though his ashes have long been scattered to the winds by the religious madness of the Huguenots, and, later, by the delicious intoxication of the French Revolutionists; there is something in the surroundings to tell us that we are in the place of rest of a man who left his stamp, not alone on his own, but on all succeeding ages. We feel his presence more at Caen than at Rouen, because the latter, though it was the capital of his dukedom, has so much else of interest to attract our attention, and because in the former every monument is indirectly connected with his name. We feel it perhaps more in Bayeux than in Caen, because Bayeux lays before us the real old historic records which make the recollection of the Norman Conquest like the recalling of a yesterday's dream, and we feel it still more at Falaise than at Bayeux, because we are there in the presence of buildings and monuments that, in their awful grandeur and severance, recall the character of the man, and of the times in which he lived. Thus from Rouen, from the grace of its delightful churches, through our four Normandy towns, do we gradually descend to the gaunt severity of the Castle of Falaise; and are brought nearer to that characteristic of the Norman times which is so prominently expressed in the actions of their heroes and the character of their architecture,—plainness and severity; and certainly these two qualifications are not wanting at Caen. On regarding the Church of St. Etienne the first impulse is to exclaim:—"How very ugly!" As if William the Conqueror, when he built the church to appease the Pope, who was incensed at his marrying his cousin Matilda, had said:—"Very well, you shall have a church, but it shall be as ugly as human ingenuity can make it!" The inside conveys a different impression, the massive nave tells another story. It says in its awful sternness:—"My invincible arches will crumble in the dust first, before William the Conqueror bends to the Pope!" Hildebrand, as history tells, certainly took the hint, but whether from the columns of the Church of St. Etienne is another question. At the other end of the town is the Abbaye aux Dames, corresponding in the object of its erection to the Abbaye aux Hommes, but wearing a more feminine character, and lighter and more ornamental in its style. Built by the Queen Matilda, it recalls the more chivalrous and poetic, as St. Etienne recalls the sterner and manlier feelings of the age.

What a difference, indeed, between the dignity of the old Norman, and the triviality of the modern French character,—between what we might suppose to be the huge brawny Norman knight and cross-bowman who guarded the castle of Caen, and the modern, stunted French soldier who amuses himself by lounging and spitting on the ramparts! There is much to see at the castle; a good view of the town, and,—a very common thing in modern France,—a graceful chapel converted into a storehouse for guns and ammunition. Let us leave Caen and go to the town that leads us still farther into the being of the past! Let us enter the peaceful streets of the old cathedral town of Bayeux.

Bayeux is one of those towns which in every possible respect merit the pathetic title of "dead-and-alive." Its streets are silent as those of an English country town on a Sunday. Its inhabitants lead lives of blissful monotony. Its whole being seems immersed in the past. But there are two things in Bayeux which give it the deepest interest, and bring us nearer to the recollection of the age of which they are such perfect representations,—the Cathedral, and the Tapestry. Reared far above the houses, the former stands as if deserted by

the rest of the buildings of its own time, alone telling of the days when William called it into being, and the great Archbishop Lanfranc consecrated it. Though the main part of what we see at the present day is the creation of a slightly later age, the whole collectively, and particularly the west front in the Pointed Gothic style, and surmounted by two fine steeples, reminds us not only of the youth of Norman civilisation, which had laid the foundations of it, but also of the maturity in the succeeding century which completed it. It is one of those churches which bears on it the early as well as the finishing touches of Norman development. The other characteristic of Bayeux is that great contemporary work, the Tapestry. Many have been the writers who have given their ideas and arguments for or against the authenticity of this venerable relic, but whether we prefer to regard it from the poetic and traditional point of view, and conjure up in imagination the Queen Matilda and her maidens in their summer palace at Bayeux, stooping over their work, and diligently plying the needle and the coloured wools, while they talk of the glory of the heroes whose deeds they are recording; or whether we regard it from the less romantic, and more practically historic point of view, and believe that Bishop Odo "had it made" in England as a gift for his new church at Bayeux,—certain it is, that no words nor paintings, no histories nor romances could more clearly describe the terrible battle which it so vividly recalls.

"The town of Falaise," says Freeman, "is one of the most famous spots in the earlier and in the later history of Normandy, and none assuredly surpasses it in the striking character of its natural position." As we approach the town there rise before us two precipitous rocks, one of them crowned by the massive castle, which has played such a part in the history of the Middle Ages. Leaving these on our left, we pass through a magnificent avenue of trees, from which, in old-fashioned style, are still suspended the picturesque oil-lamps, and enter the town that, more than any other, is characteristic of the Norman age. After traversing a few streets with nothing of any great interest to recommend them, we reach the Church of St. Gervais, the patron-saint of Falaise, and a little further on, the Church of St. Trinité, which, though architecturally it may be heresy to say so, makes a most charming picture when seen from one of the smaller by-streets, a portion of the west end being built over an archway, under which runs the thoroughfare, and the old building with its half-decayed masonry looms out of the background of the picture and is framed in by two rows of quaint white houses. Turning again to the left, a slight détour brings us to the square near the foot of the castle entrance, where stands the famous bronze statue of the Conqueror, by Louis Rochet. The impression it conveys is a striking one. Mounted on a charger, the hero of Senlac is leading on his men for the final charge, and we see him as if in the act to burst through the last rank of Harold's stubborn house-carls. The feeling of the whole work is summed up in the word "power." Around the pedestal stand his ancestors, also in bronze: Robert the Devil, small statues, also in bronze, but while they are modelled from the fancy of those qualifications which each in legend possesses, the statue of the Conqueror is wrought from the true feeling which a study of his character in both history and legend has inspired. A minute's walk brings us to the incline which leads from the town up to the castle, and it is as we mount this that we think of the real grandeur of Falaise, of the meaning of its name,—the rock; of the characteristic of its heroes,—solidity; of the terrible fastness of its castle walls, that have passed through ninety tremendous sieges; of the awful tales told, and yet untold, by its dungeons and oubliettes; of the warriors connected with its name, and of a romance and pomp of chivalric times. Standing upon the summit of the castle, we see stretched beneath us the peaceful fields in which the quiet Norman peasant now feeds his flocks, where runs the little river Aute, on the borders of which, among the grass and flowers, the beautiful Herlova, the mother of the Conqueror, the tanner's daughter, as the legend tells, was espied by the young Count Robert who loved her, and bore her off to his castle. Falaise! the very ring of its name is like the blast of a trumpet, at which the old clank and dignity of Feudalism once more revives.

see knights and barons encased in armour, receiving chivalrous love-tokens from the hands of their ladies; we see sturdy cross-bowmen and pikemen; we hear the clanking and rustling of maces and halberds, the ring of steel corselets, and the clamping of steeds; we catch the stray notes of wild music from the lips of some troubadour, who is singing the fiery stanzas of the Roman de Rou; we see the bustle, the glitter, and the pomp; and, lastly, a huge figure emerges from the crowd. There is a hush; all bow in reverence. We recognise who it is at once, for he bears on him the armour of the statue of Rochet, the armour that the Bayeux tapestry recalls, and he has impressed upon his face that terrible dignity and relentless determination which mark him as the hero of his age,—the Conqueror of England.

ELECTRIC LIGHTING.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The eighth ordinary meeting of this Institute for the present session took place on Monday last, Mr. David Brandon, vice-president, in the chair.

The hon. secretary (Mr. J. Macvicar Anderson) intimated that the second moiety of 25*l.* in connexion with the Soane Medallion had been awarded to Mr. Robert Alexander Briggs, Associate. Mr. Briggs's sketches combined great accuracy with considerable artistic power. The Council considered they were not only justified in making this award, but had great pleasure in doing so.

Mr. Killingworth Hedges, A.-M. Inst. C.E., then read a paper entitled "Precautions to be adopted in introducing the Electric Light into Houses," of which the following is a summary:—

The author began with a reference to two papers on the electric light read before the Institute by Mr. Slater in 1881 and 1882 respectively, and spoke of the great progress made since in the commercial application of the invention. To facilitate the lighting of streets and private houses, the Electric Lighting Act of 1882 was passed, under which twenty-three applications for provisional orders were made in that year by local authorities, and 106 by companies formed for the extension of the system, which, however, the stringency of the regulations laid down by the Board of Trade had temporarily checked. Meanwhile, a largely-growing number of occupants of houses had set up the necessary plant for producing the light themselves. A description was then given of the plan for supplying electricity to private dwellings by means of batteries. The most effective system of the kind seemed to be that invented by Mr. Ross. The various modes of generating electricity were next rapidly reviewed. In town houses a gas motor was, as a rule, the best; in country houses all three sources of power,—water, steam, gas,—had been employed. Common coal gas could be dispensed with by using Dowson's gas, of which a description was given, and whose great advantages were set forth at length. The cost had proved to be 50 per cent. less than that of the ordinary article at 3*s.* per 1,000 ft. The engine-house would contain the dynamo, which should be fixed on wood, to insulate them electrically from the ground. From the dynamos the current should be taken to a switch-board. If accumulators were used the current from these would join on to the same board. From this switch-board the mains went to the lamps, starting as a large cable, which branched away like the gas-pipes, until each incandescent lamp was reached. It was of the last importance in electric lighting that the current should always be uniform at all times in each individual part of the work, and independent of changes in other parts. The compound shunt machine for effecting this was then described, and it was shown that by means of it the regulation of the electric supply is more perfect than that of gas. The honours of this invention were claimed by several of our British electricians. A highly effective form of the machine was that designed by Messrs. Crompton & Kapp, who had greatly improved on the Bürgin dynamos, while Dr. Hopkinson had not only materially reduced the cost of Edison's, but had increased the commercial efficiency some three per cent. The actual efficiency of the improved Edison-Hopkinson dynamos was now 94 per cent., and its commercial efficiency 88 per cent. To enter, however, into a comparative description of the different systems possessing these advantages,

and to discuss their relative merits, was beyond the author's scope, and he therefore proposed to describe some of the principal features of a supply of electricity, and to point out the precautions necessary to its safe introduction and the guarding against fire risks. In the first place, to understand what this electricity is, the author said, we must disabuse our minds of the notion of that "invisible subtle fluid" of which men still talked so nervously, but which we daily used with impunity for ringing bells and working telephones. The electricity used for lighting was doubtless far more dangerous if uncontrolled, but if properly installed it was made as harmless as the galvanic battery employed by the popular lecturer in his experiments. The light was nothing but electric energy in the form of white heat, and the only peril was that this heat might be developed where it was not wanted, and might so cause fire. The possible danger from this cause had already attracted much attention both in this country and abroad. A Special Fire Risk Committee appointed by the Society of Telegraph Engineers and Electricians was formed in 1882, and a set of excellent rules were drawn up by it, which were adopted *mutatis mutandis* by some of the insurance companies, and also by the Board of Trade in its "model order." Neither these rules, however, nor the "Standard of Requirements" laid down by the New York Board of Underwriters, could be said to embrace all the changing details of an electric light installation. Such details could only be arrived at after the electricity had been worked a sufficient length of time, and had been generally distributed like gas. With a view of eliciting further discussion on the subject, the author proposed to offer a few general remarks as a small addition to what had already been put forth by the Fire Risk Committee. The first source of danger to property, he said, is in the mains and branch wires [which conduct the electricity from the engine-house to the incandescent lamps, which were distributed over a house in much the same way as gas. If these conducting wires were of sufficient calibre, and made of a material uniform in its resistance, the current would not develop in its passage any dangerous heat. In arguing the question as to the proper sectional area of the conductor, the author remarked that the electro-motive force had been compared to the difference of head of water necessary to cause a quantity of fluid to overcome the resistance of a pipe, whereas it was more like water soaking through sand, in that the whole of the cross-section of the wire interposes a resistance which in large conductors doubtless varies proportionally to the temperature of each section according to its distance from the outside radiating surface. As for the material of the wires, it was commercial copper, which was never absolutely pure, but could be got as high as 96 to 98. Now, since the wire's resistance depended on its purity, a short length of inferior wire might upset calculations based on the hypothesis that none but the purest wire is used. Thus not only might that inferior section become dangerously heated, but there would also be a waste of power. Copper was always used for electric-lighting purposes, both because it can be got purer than any other available metal, and because next to silver it is the best conductor of electricity. Having examined the proportion of the electric conductors to their work, the author went on to discuss the question as to the effect of a stream of electricity continually passing along them. He had found that if heating goes on largely, a change in the conductivity of impure metals may take place, but pure copper is apparently unchanged. A summary view of the evidence on which this conclusion rests was given. Passing thence to the subject of electrical connectors and joints, the author said special attention should be given to these, including not only all the joints where the branch wires lead off, but also the connexions made with binding screws. Besides causing resistance in the circuit, bad contact between a wire and a terminal would engender heat; hence the area of the contact piece should be large enough. It was further shown how provision should be made in the case of a sliding connexion for taking up the wear and firmly pressing the surfaces together. The joints used were most important factors in an electric light installation. For these joints solder alone should never be relied on. A joint must be made mechanically perfect, and considerable pressure used to unite the surfaces; the solder might be then applied to keep the whole air-

tight. The next section of the paper showed how the danger arising from short circuits was to be met. The term, it was remarked, meant that the current instead of going a circuitous route takes the shortest path, where, having no work to do, it causes fire. The three ways in which short cuts might be set up were pointed out, as well as the measures to be adopted in such emergencies. The only preventive was a cut-out or safety fuse. The author referred to experiments of his own in order to ascertain the most suitable and reliable material. After trying numerous foils he obtained a special alloy of aluminium, whose resistance, as compared with that of silver, was about 45 per cent. Testing an installation was the next subject for consideration. To ensure this being properly carried out, a current, capable of overcoming a high resistance, should be sent through the whole of the wires; that from an ordinary battery was of little use. A portable hand-apparatus was used for this purpose in America, which, on turning a handle, sends a current through every one of the wires, and shows any leakage by ringing a bell. The foregoing remarks, said the author, had been made with reference to incandescent lighting, but applied to arc lights also, which latter brought with them other fire risks of their own. The chief of these was the danger arising from pieces of incandescent carbon dropping, and more fires had occurred from this cause than from any other. Before quitting this subject he gave some interesting information as to how some of the fires caused by the electric light in America had happened. In one district, in which there were sixty-one mills, fifteen fires were due to some form of "short circuit," generally owing to the leakage of water or the washing of floors. All of them would have been prevented by proper insulation and reliable fusible safety plugs. Three fires were caused by cross arcs of one wire to another, where uninsulated wires were fastened against conductors. In one instance the conductor was formed by dust settling upon uninsulated wires, and on a damp day it absorbed enough moisture to make a path for the formation of a cross arc, which started a fire. In a second case the wires were fastened to a damp beam which was decayed and burned nearly in two by a smouldering fire. In a third instance damp brickwork in a tunnel became a sufficient conductor to set up an arc which did no material damage, but injured the dynamo. These fires were not necessarily destructive, as they generally occurred during working-hours, and so were soon discovered and dealt with. Electricity, though having no smell, like gas, to betray a leak, showed when it was escaping by the diminished brilliancy of the lights. In London Captain Shaw reported no fire as due to the electric light for 1882, and but one in 1883; this was due to the overheating of the wires. In this country the installations had, as a rule, been in the hands of skilled persons. It was most necessary that in the eagerness and hurry to push forward the new light, the work of wiring houses and fixing the lamps should not be left to bell-hangers and others destitute of the requisite knowledge of electricity. The best guarantee of safety in the use of electric light was the employment of experienced men in the work of installation. In such hands it was far less dangerous than gas, which not only poisons the air we breathe, but ever lurks as a slumbering volcano ready at any moment to put forth a terrific power. When properly installed and managed electricity was by far the safest illuminant known. It was to be hoped the insurance offices would soon recognise the fact by reducing the premium on all buildings from which gas is excluded. The alleged comparative immunity of the electric light from accident was accordingly treated more in detail in a special section, which was followed by the author's closing remarks on the important subjects of wear and tear and working cost, all of them involving a good many technicalities in their discussion.

Mr. Slater, in opening the discussion, referred to the disappointment which had been felt at the comparative want of success of the electric light. Three years ago, when he brought this subject before the Institute, people believed that there was a brilliant future before it, and the public mind was excited by an unwarranted belief in the immediate commercial success of the supply of the electric light on a large scale. This had brought about Stock Exchange specu-

lation and immature installations, followed by the most unfavourable results. If ever there was an invention for which the motto *festina lente* should have been adopted, it was that of the electric light. And in spite of all the attacks which had been made upon it, he would ask if it had in reality been a failure? He had only to point to the numerous hotels, steamships, and private residences in which the light was used to show that it had not been a failure. Many difficulties had to be surmounted before houses could be lighted with the regularity and simplicity attending the use of gas, but these were gradually being met. Mr. Hedges had rather thrown two difficulties in the way of domestic electric lighting, in regard to the wiring of the houses, and the fittings for the lamps. In the case of a new house, arrangements could be made for chases where the wires were to go, and they could be covered by raised mouldings, there being no better non-conductor than plaster or cement. If they cut the joists, and the walls or ceilings, injury might be done to the interior decorations, which would lead to no end of expense. The best plan was not to attempt to conceal the wires, but to cover them with insulating material, corresponding in outward colour to the existing decorations. Two years ago he expressed himself in favour of doing away with fittings to a large extent, and the result of experience had confirmed him in that view. Single lamps depending from the ceiling, and sustained by very fine cords, had a good effect. Artistic and tasteful fittings were brightest, but expensive, and if not expensive they were nasty. On one point caution was necessary. It was not wise, for economy's sake, to utilise existing gas-fittings. They looked incongruous, and the electric wires passing through gas-pipes seemed to rapidly deteriorate, which might lead to disastrous accidents. He concluded by proposing a vote of thanks to Mr. Hedges.

Mr. Blakesley bore testimony to the excellence of Mr. Hedges's foils. Without such things electrical plant would be extremely dangerous, but with those foils the light became perfectly safe.

Mr. E. A. Grünig said that he had two installations in hand at present, but he was not yet able to say what the cost would be. He seconded the vote of thanks.

Mr. Hebb remarked that the advantage of the light in public buildings, and especially in theatres, must be indisputable. He would like to know if there were any special precautions against accidents in the case of installations in theatres. He believed the light would be more extensively used in theatres, and the Metropolitan Board of Works were considering the advisability of revising the regulations for theatres made some time ago.

Mr. Crompton referred to the great development of the light. The dynamos had been so improved that they now gave two and a half times what they did two years ago. The lamps lasted twice as long, and the cost of the apparatus had been proportionately decreased, while the liability of the light to go out had been removed. In fitting up the light in old houses, he had utilised the services of ordinary bell-hangers, which had greatly reduced the cost of wiring the houses. The plan adopted was to light the rooms from the ceiling, taking up the floor above, threading the wires through the joists, and piercing the ceiling. Danger was minimised by the use of good materials, but if the estimates were cut down the lighting might become dangerous. Out of some 70,000 or 80,000 lights he had never had an over-heated wire. The greatest dangers were to be feared from bad and cheap workmanship. The electric light was not dangerous, for with a small modicum of care, and a proper sum allowed for wiring, the danger was infinitesimal compared with that of gas.

Mr. Hedges, in replying, said he had not given details as to the wiring of houses, as electricians seemed to take different views on the subject. It was impossible to run wires all over a house when a man had spent a great deal on its decoration. The use of the electric light in public buildings was a great subject. It would never do to put all the lights on one wire, in a place where many people were crowded together. There was no difficulty in leading the large main into a theatre or public building, but it was very necessary to have a very thick insulation. He agreed with Mr. Crompton as to the danger of gas as compared with the

electric light. Indeed, Captain Shaw had informed him that if the light were generally used, half of the present fires would never occur.

The vote of thanks was then passed to Mr. Hedges, and the proceedings terminated.

MONUMENTS OF LYCIAN ART.

THE TOMB AT DJİLBASHI.

PROFESSOR NEWTON's sixth lecture of this course,* delivered at University College on the 8th inst., was principally devoted to the subject of the Lycian language and the written character, as they are known to us through inscriptions found in Lycia, and especially those on the great obelisk or stele of Xanthos, which is a square pillar, about 20 ft. high, and is covered on the four sides with a long inscription in the Lycian language. On one side twelve lines of a Greek metrical inscription are inserted in the middle of the Lycian text. This metrical inscription, of which the first line is borrowed from a celebrated epigram by the lyric poet Simonides, celebrates the deeds in war of a certain Harpagos, probably a descendant of the Persian general of that name, who conquered Lycia for Cyrus after the overthrow of Croesus. The Lycian text of the great Xanthian stele has not yet been satisfactorily interpreted, but Savelsberg has recognised in it the names of the second Artaxerxes and of his successor Darius, of certain satraps otherwise known to us from coins or ancient authors, and of the Athenians, Spartans, and Ionians, who are grouped together in the same part of the text. Hence he conjectures that the inscription relates to the league of certain satraps with the Athenians, Spartans, and Ionians, which was formed about B.C. 365, and which was defeated by a satrap who remained faithful to the King of Persia. The date of one of the bilingual inscriptions is fixed by the mention in it of Pixodarus, who reigned in Caria, B.C. 340-30, and who appears to have conferred some benefit on the cities of Xanthos and Tlos.

In his concluding lecture, Professor Newton gave an interesting description of the tomb at Djilbashi, discovered in 1842 by a German traveller, who purposely concealed its exact situation, in order that his intentions might not be anticipated. From 1842 the tomb remained unvisited until the recent expedition of the Austrian Government, conducted by Professor Benndorf, who is at present Keeper of the Antiquities in the Museum at Vienna. It appears that some two years ago a society, which was formed in Vienna somewhat on the model of our Dilettante Society, provided the funds for sending Professor Benndorf out as the head of an expedition to make surveys and photographs of this part of Lycia. The only report of this expedition which had yet been published (as far as the lecturer knew) was printed in the "Proceedings" of the Academy of Vienna. The remarkable sculptures of the tomb at Djilbashi had now been sent to the Museum at Vienna, and he was glad to say that casts of some of them would be exhibited in the Gallery of Casts which was to be opened at the South Kensington Museum in May next. The work of transporting the sculptures to the coast was one of extreme difficulty, and the members of the expedition encountered considerable privations, as the tomb was built upon a plateau 2,800 ft. above the level of the sea, in the midst of a desolate and rugged country remote from inhabited parts. It was to be wished that the enterprise shown in this work by the Government of a comparatively poor country like Austria would have the effect of reviving in this country something at least of that spirit of splendid enterprise with regard to Classic antiquities which was formerly displayed by us, but which appeared to have quite died out of late years. The site of the tomb at Djilbashi was an acropolis, with a great wall of Cyclopean masonry round it. Surrounding this acropolis were a great number of the tombs with pointed roofs described in a former lecture.† Abutting against the wall of the acropolis was the great tomb, which on plan was a parallelogram from 60 ft. to 70 ft. in length, the external face of the walls on each side being built with hewn stones of large size. On each side of the door or

entrance to the tomb (which was on the south side) was a double frieze in relief, which ran along the whole south face of the building. This was not continued along the outer face of the other walls, but upon the four inner walls, at a corresponding height, was a similar double frieze. Immediately above the exterior of the doorway were four great projecting bulls' heads, and immediately in the centre was a Gorgon's head, placed there, no doubt, to avert the Evil Eye. Below these were small figures of two men and two women, with two attendants and two dogs. These groups, no doubt, represented the persons or families to whose honour the tomb was erected, they being placed quite apart from the sculptural decorations contained in the friezes. On the western side of the doorway the sculptures represented a battle of Amazons, and below this a battle of Centaurs. On the eastern side of the doorway the upper sculptured frieze represented the famous fight of the Seven Argive chiefs against Thebes, while in the lower frieze was a representation of an Oriental potentate receiving homage. Passing inside the doorway the sculptures of the doorway itself were very curious. Over the door was an extraordinary group of little dwarfs, apparently something in the nature of Satyrs, playing upon musical instruments. On each side of the doorway were two male figures, standing. They were corresponding figures to those which occur in the tomb in the Lycian Room at the British Museum. Proceeding to describe the double frieze running round the interior walls, the lecturer traced the various subjects represented, which were illustrated by means of photographs and drawings. One of these subjects was the slaying of the Calydonian boar, which must have been originally a very fine composition (the sculptures) considerably decayed. Another interesting subject was the slaying of the suitors of Penelope by Ulysses, as recounted in the Odyssey. On the interior of the west wall was a most remarkable continuous composition representing the siege of a city on a coast, there being at the beginning of the composition the prows of vessels hauled up on the beach just as they were in the Trojan war. A peculiarity in these friezes previously unknown to us is that the friezes are not distinct,—i.e., the subjects of the upper and lower friezes blend with or merge into each other in a manner which is quite new to us. The other subjects represented in these internal friezes were the Battle of the Greeks and Amazons, and (on the north wall) a remarkable composition representing the carrying off of the daughters of Leukippos by Castor and Pollux. On the eastern wall were represented the exploits of Theseus. Within the space enclosed by these sculptured walls was a magnificent sarcophagus, which remains *in situ* at present, though the Austrians hope to remove it next year. Its removal will be attended with considerable difficulty, as it is of immense size, and weighs many tons. One remarkable feature about these sculptured friezes was the amount of perspective exhibited in them, which was very noteworthy, and, in the opinion of many, afforded proof that these sculptured representations were copied in stone from painted representations of the same compositions, by Polygnotus or some other Athenian painter. We knew that some of the subjects sculpturally depicted in this tomb were painted by Polygnotus. As to the date of these sculptures, the lecturer was inclined to think that they were produced about the year 350 or 360 B.C.,—a somewhat later date than that assigned to them by Mr. Murray, who thought they dated from the fifth century B.C. He wished he could say to what Lycian potentate this sumptuous tomb was erected. He did not know whether any inscriptions had been found which would be likely to throw any light on this point. In conclusion, the lecturer again adverted to the example which Austria had shown in undertaking this expedition. Every thing in this direction which had been undertaken by this country of late years had been done in a half-hearted and inadequate manner. As a case in point he referred to Mr. Wood, who had been endeavouring to complete his investigations on the site of the Temple of Diana at Ephesus, and who, failing Government aid, had been sent out with the miserable sum of 400l. or 500l. (liberally raised by subscription among a few friends of the work) when he ought to have been provided with as many thousands of pounds to enable him to do his work properly.

* See Builder, pp. 92, 142, 161, 184, ante.

† See p. 161, ante.

EGYPTIAN ARCHITECTURE.

[WITH ILLUSTRATIONS.]

On the 14th inst. Mr. R. S. Poole, LL.D., gave his second lecture on Egyptian architecture at the Royal Academy.* After a few words about the books which students ought to read, in order to gain a thorough knowledge of the subject, and the recommendation of Perrot and Chippiez's "History of Egyptian Art," translated by Mr. Walter Armstrong, the essential handbook of the subject, giving all needful reference to the several authorities; Wilkinson's "Architecture of Ancient Egypt," useless in theory, but with admirable plates, firmly drawn and hand-coloured; also the larger works of Lepsius, Rosellini, and others, he spoke of the third period of Egyptian architecture, namely, that of the empire from 1600 to 1200 B.C. In the last lecture he had spoken of the religious character of the tomb, and had mentioned that towards the close of the pyramid age it became more historical. From 2500 B.C. to 1600 B.C., during the second period, of which the monuments are scanty, it developed architecturally, use being made of the many-sided fluted column, the so-called Proto-Doric, which originated from the old square column, as seen in the Temple of the Sphinx, pl. 3 (A). It had in the case of the excavated tombs at Beni Hassan three parts, the portico, the hall of columns, and a very small chamber or niche, in which was the statue of the deceased, this niche being the survival of the corridor. The statue was an architectural feature, and no longer the living representation in which the shade could dwell. In the age of the Empire the tomb grew into a temple. It is worth noticing that at this time it had before it a little garden, a miniature of the planted enclosure which surrounded the temple. The deceased prays in the sepulchral tablet that his soul may here enjoy the cool north breeze, and the fragrance of the flowers. (See E), where we see the widow visiting the garden to bewail her husband, a most interesting tomb of an earlier date, discovered last year by Professor Maspero, high in the side of the desert rock in Western Thebes, had its entrance concealed by a very ancient lanrel, the last survivor of the little garden, which once made its front gay with flowers. The royal tombs must also be noticed as deep excavations in the mountain, combining the principle of the interior of the pyramid with that of the ordinary tomb (B).

There were now two kinds of temples,—the temple proper, which was used for worship, and the sepulchral temple of Thebes, which was the chapel of the king's tomb, hidden in the valley behind. Each temple had three essential parts,—the portico, the hall of columns, and the sanctuary; and this is sufficient to prove the derivation from the tomb; in fact, the plans of rock-temples and rock-tombs were identical (comp. D, F, with C). The temples, sepulchral or not, were dedicated to the gods; but the records which they contained were chiefly historical. Thus the great temple of Thebes at Karnak, the "Westminster Abbey of Thebes," recorded a multitude of historical events, and the earliest treaty extant, one made between Ramses II. and the Hittites, 1400 B.C., was placed on one of its walls. The materials used were sandstone and red granite. In Upper Egypt the walls were of sandstone and the doorways of granite. In Lower Egypt the buildings were made entirely of granite, the columns being solid monoliths. The great temple of Tanis, 600 ft. long, was wholly composed of this costly material, brought nearly 900 miles by river. The form of the temple was purely rectangular. The main structure was always perpendicular, sometimes with a winged portal having sloping sides to vary the effect of the horizontal lines. Farther, the horizontal lines were cut by the obelisks and by the tall flagstones which were attached to the front of the winged portals. The Egyptians had, in spite of, or because of, their quadrangular plans, a dread of the effect of absolute symmetry, which has been called symmetrophobia. Thus, in the period under consideration, they placed a wholly different order of columns at the opposite sides of a court. This principle was more subtly carried out under the Egyptian Renaissance by the combination of different columns, balanced by their repetition at regular intervals, thus: 1, 2, 3, 3, 2, 1,—in the front of a portico.

* For a summary of the first lecture, with illustrations, see last week's *Builder*.

Some temples, moreover, had a double axis, like the churches of which the nave and chancel-chapel are necessarily placed in somewhat different directions (I). A temple at Abydos has a strange form, which makes it like an inverted T (G, Cf. also F, for several deviations). The chambers and courts were usually made each narrower than the one that went before (F, H, I), an artifice which lengthened the view to the people, who were only allowed to enter the great court while the priests passed into the hall of columns, and the king, or his representative, entered the sanctuary at the very end. Thus the worshippers in general never looked back.

The entrance court, the hall of columns, and the sanctuary, with their adjuncts, were all sculptured or painted, even when the material was granite,—granite being used for hardness, not colour. The wall of circuit was made of crude brick, with granite portals. From its principal portal the way led between an avenue of sphinxes, rams, or lions, and was closed by a pair of obelisks. The lions were fine works of sculpture. Mr. Briton Riviere, R.A., in a letter to Mr. Poole, which he has kindly authorised him to print, speaks of the excellence of the type of the Gebel Barkal lions in the British Museum as having profoundly impressed him "by its excellence as a translation of a lion into an architectural form. This the unknown Egyptian artist has done to perfection. Not only has he rendered into stone in a masterly manner the large lines of the animal, and thus shown that he had no mean knowledge of its anatomical structure, but (and this is, indeed, rare in decorative art of so broad a character) he has saturated his work with those distinctive and more subtle characteristics of the lion upon which, I believe, the majesty of his appearance depends; and to do this as he has done it he must have been not only a keen but an imaginative observer of nature. Any comparison between this and the Assyrian lions seems to be profitless. They, on their own ground, will always be matchless; but this lion does not lie upon their ground."

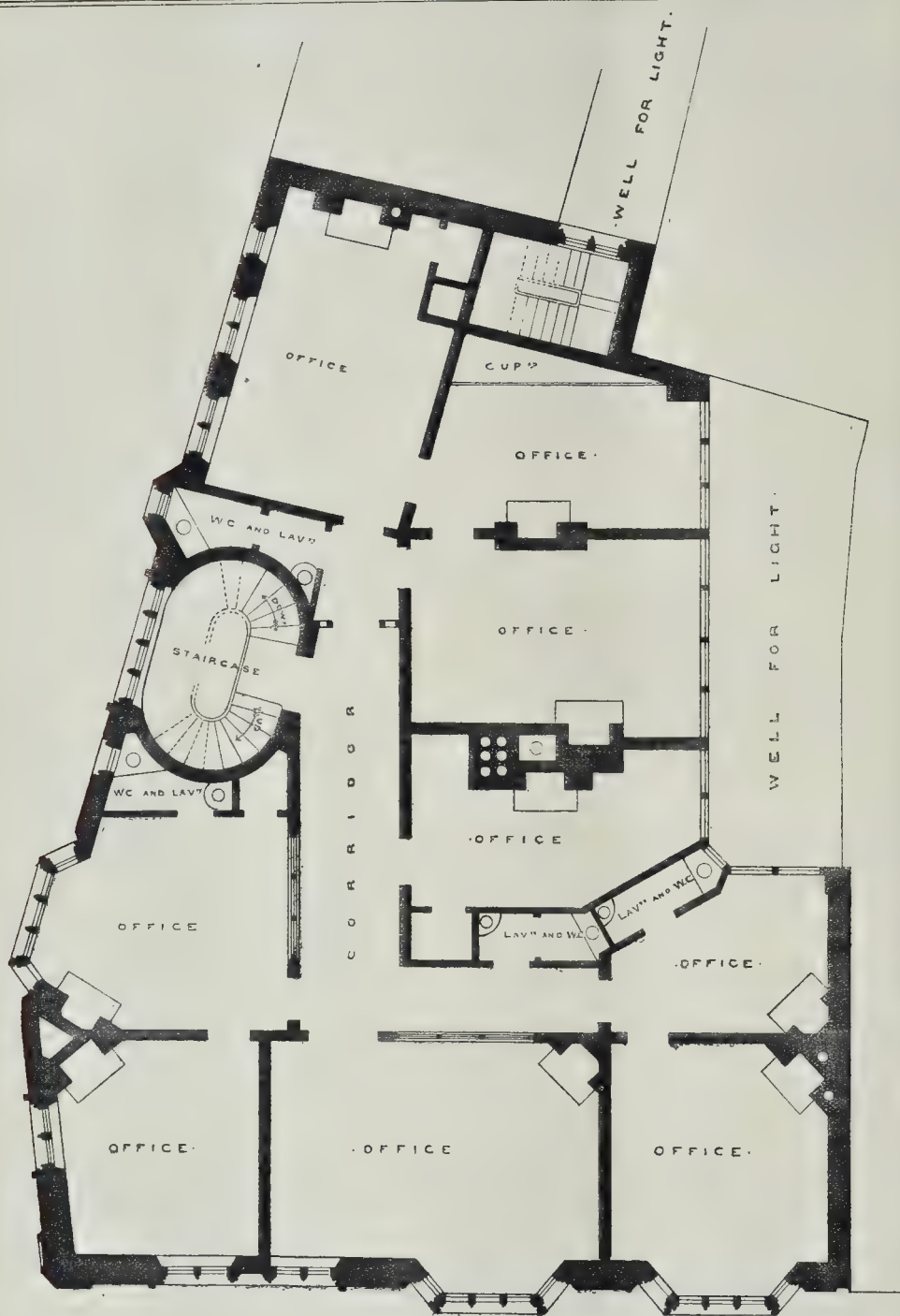
In the time of the Empire there were four principal orders of columns. The Proto-Doric, with eight or sixteen sides, either plain or fluted, was made by cutting away the square columns (see pl. 4). Four varieties of this column are here given—the first and second (1, 2) cir. B.C. 2500, the third (3) about 1600, the fourth (4) about 1400. The bell-shaped or papyrus form (8) has a capital with the conventional form the Egyptians gave to the tufted heads of water-plants. The so-called bud-shape (7) is merely a farther conventionalisation of the capital already in use, which represented water-plants bound together (5). The Osiride shows the king as Osiris standing against a square column. The last was much used in sepulchral temples. In the great temples the columns with bell-shaped and bud-shaped capitals were mostly employed, the central higher avenue having the expanded type, the other avenues the narrower form. The effect of these massive columns was very startling; for on entering the hall of columns of Karnak, there is a central avenue of twelve (8), having a height of nearly 70 ft., and about 12 ft. in diameter, and fourteen lateral lines of 120 columns (7) of over 40 ft. high, and about 9 ft. in diameter. This one part of the temple would contain the cathedral church of Notre Dame at Paris within its walls. (A curious pilaster, B.C. cir. 1300, is shown in fig. 6.)

From about the year 666 B.C. the art of Egypt took a new development. This development, retarded for a time by the Persian conquest, is little known until it acquired its fulness three centuries later under the Greek kings of Egypt. M. Perrot, regarding it only at this time, calls it a new movement of old forms, but Mr. Poole attributes it to a new impulse. The marvellous creative spirit which we call Greek was not only alive in Greece, but stirred elsewhere. Thus, in Assyria, the lion which Mr. Briton Riviere terms "decorative," having held his own for at least two centuries, became in a moment the wonderful creature seen in the reign of Assurbanipal, full of what the same authority terms "the essential natural"; and in Egypt the artists were animated by a novel instinct, which resulted in the creation of graceful figures and new attitudes. The new spirit was in the air, and all artists felt its invigorating influence; even as we find with art's twin sister, poetry, in the fourteenth century. For in the age when Dante and Petrarch were

idealising human love into religion, the Persian poet Hafiz was singing the same music, ignorant of his Italian brethren. In 527 B.C. Egypt was crushed by the Persian invasion. At the close of the long struggle with Persia, just before the Greek dominion, we find in Egypt new orders of column. Thus Egyptian art took final form under the Greek rule (331–24 B.C.). It was wholly religious as in olden times, and all for the gods. The people had lost their historical instinct, and their strong belief in immortality; but their place was filled by Platonic ideas. Plato reigned supreme in Alexandria, and the belief in the Good, the True, and the Beautiful was taught by his followers. The Greek spirit of method and form now ruled Egyptian architecture. This was instanced by the temple of Denderah, which was not, like many of the older temples as Karnak, an aggregate increased by the wish or caprice of successive monarchs, but a complete unity conceived by the architect, and as in the case of the design of Imhotep, the only Egyptian artist whose name has survived, the architect of the pile of Edfoo planned, and carried to completion, even, as in this case, in a long period of years. Denderah is arranged in a true Platonic system: not only is each hall and chamber apportioned to its proper purpose, but the sculptures and inscriptions show us the gradual initiation of the king into the deepest thoughts, not of the Egyptian religion, but of Platonism. He begins merely making offerings to Hathor, the goddess of beauty, but when he reaches the sanctuary he worships her as goodness, beauty, and truth,—the great ideas of Plato,—and we see in this the effect of the teaching that each human soul before it came to earth had been in the presence of goodness, beauty, and truth, to which it must ever look back in its mortal struggle for immortality. But while knowing method and form, the Egyptians lacked the third great quality of the Greeks,—elimination. They could not cast away the embarrassing conditions of their hieratic sculpture. In painting it seems that by lowering the tone, choosing as it were the minor key, and by subtle juxtaposition, they succeeded in obtaining the effect of mixed colours; but this idea is yet challenged, and needs a careful inquiry. Again in the Ptolemaic age the artists had lost the strength of hand which made the earlier curves so true, and we feel that we must retranslate the outlines of the beautiful capitals by the older principles in order truly to appreciate what the Renaissance, had it bloomed earlier, might have been. To understand the art of this age we must study these capitals, which are almost endless variations of the old bell-form besides new types. Mr. Poole first showed the columns in combination at Edfoo, Esne, Ombos, and Philæ; and then commented on the charming drawings of the capitals lent him by Mr. Phené Spiers. In the columns he pointed out the admirable effect of a treatment already noticed, the repetition of different modes balancing one another. The capitals show the variety of plays on the bell shape (see pl. iv., figs. 9, 12, 10), sometimes developed in itself when it becomes a lotus, or with a floral arabesque covering its main forms, which may be the true parent of the Arab floral patterns. The graceful and simple palm-tree column also is now used (see fig. 11). The Greeks had taken the gift of the Doric shaft from Egypt. They repaid it with the suggestions of the Corinthian (see pl. iv., figs. 9 and 12) and the Ionic capitals (10).

Mr. Poole ended with his first subject,—the Egyptian house. He had said that the tomb was developed from the house. The oldest house could only be conjectured. It is not until 1500 B.C. that we find a picture or model of the house of that age. Comparing it with the modern Egyptian house of fifty or a hundred years ago, we see the same features, the portal, the court, the lattice-work windows, the belvedere, the curious standing ventilators opening to the north, in the old house two being represented back to back, to show that they stood one behind the other. Thus Egyptian art cannot be understood unless it is viewed in its whole range of 5,000 or 6,000 years.

Borough Engineership, Dewsbury.—Mr. Horace Hey, of the city surveyor's office, Manchester, has, at a meeting of the Dewsbury Town Council, been appointed borough engineer for that town. There were 102 applicants.



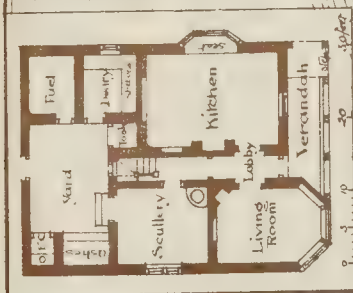
FIRST FLOOR PLAN

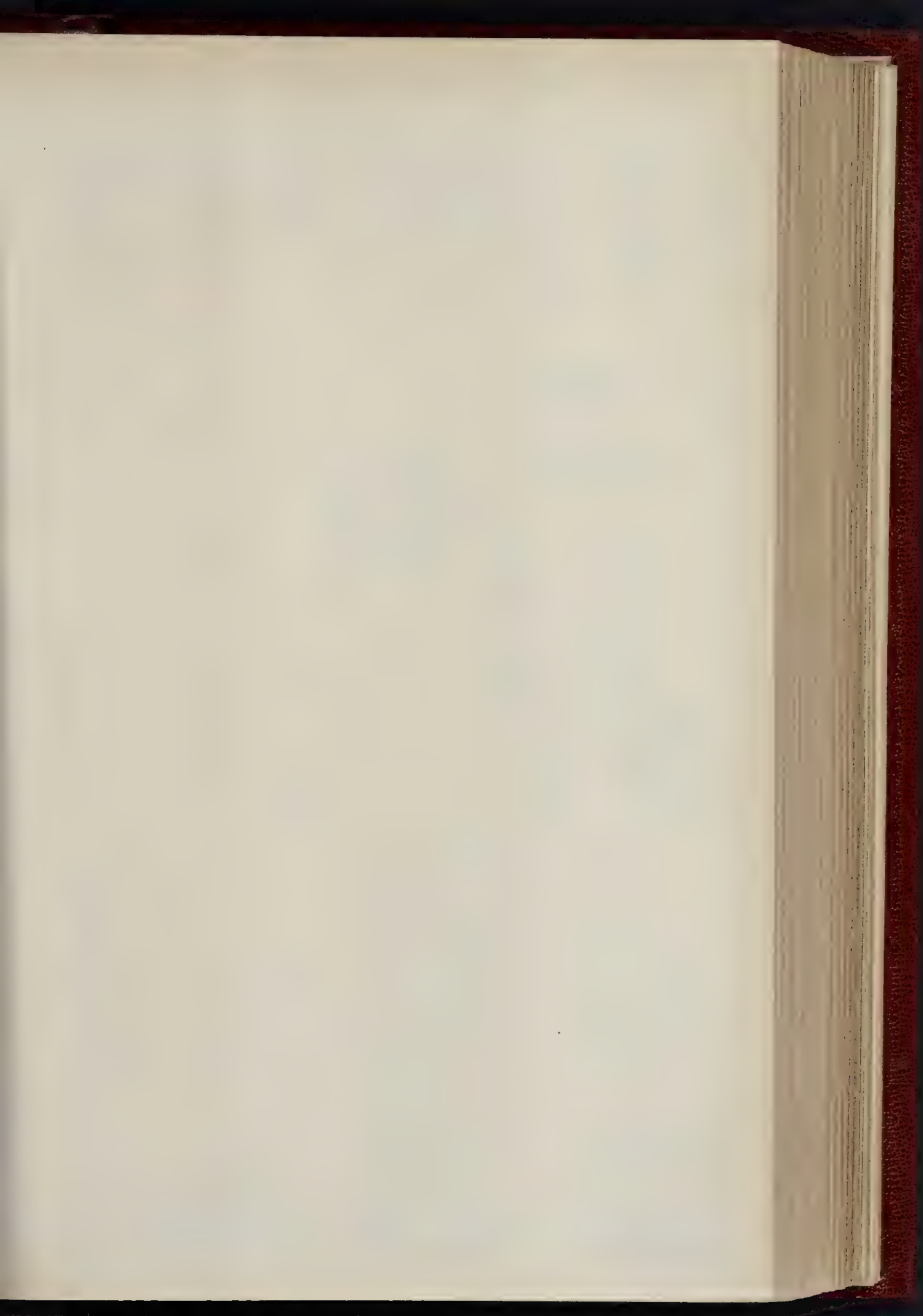


NEW PREMISES, CHURCH GATES, SHEFFIELD.—MESSRS. M. E. HADFIELD & SON, ARCHITECTS.



Gardeners' Cottage —
— at Ballrath-Bury, Co. Meath —
for C. A. Nicholson Esq.
T. N. Deane & Son, Architects







THE TEMPLE OF THE SHINKU

A



B

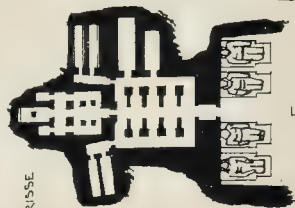


AFTER MASPERO

THE GARDEN BEFORE THE TOMB

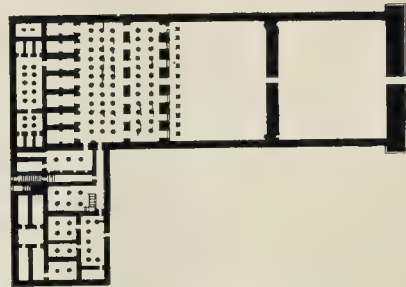
E

THE TOMB OF RAMESES II. AFTER PRISSE



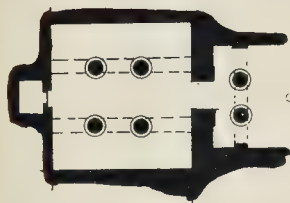
GREAT TEMPLE, ADOOSIMBEL

FIGURE 1111111111



TEMPLE OF ADOOSIMBEL, AFTER PRISSE

G



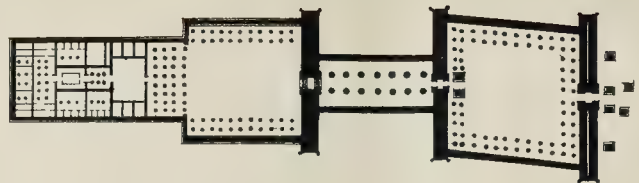
C

ROCK TOMB BENI HASSAN



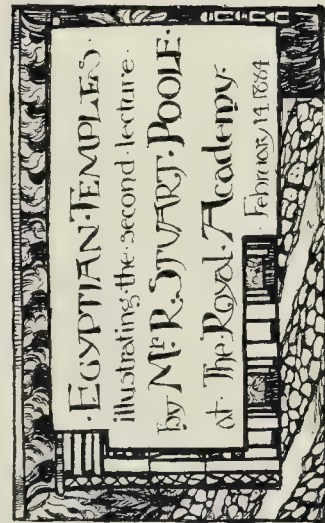
D

TEMPLE OPPOSITE EDOF
FROM WILKINSON



TEMPLE LUXOR

THE TEMPLE OF ADOOSIMBEL, FROM PRISSE



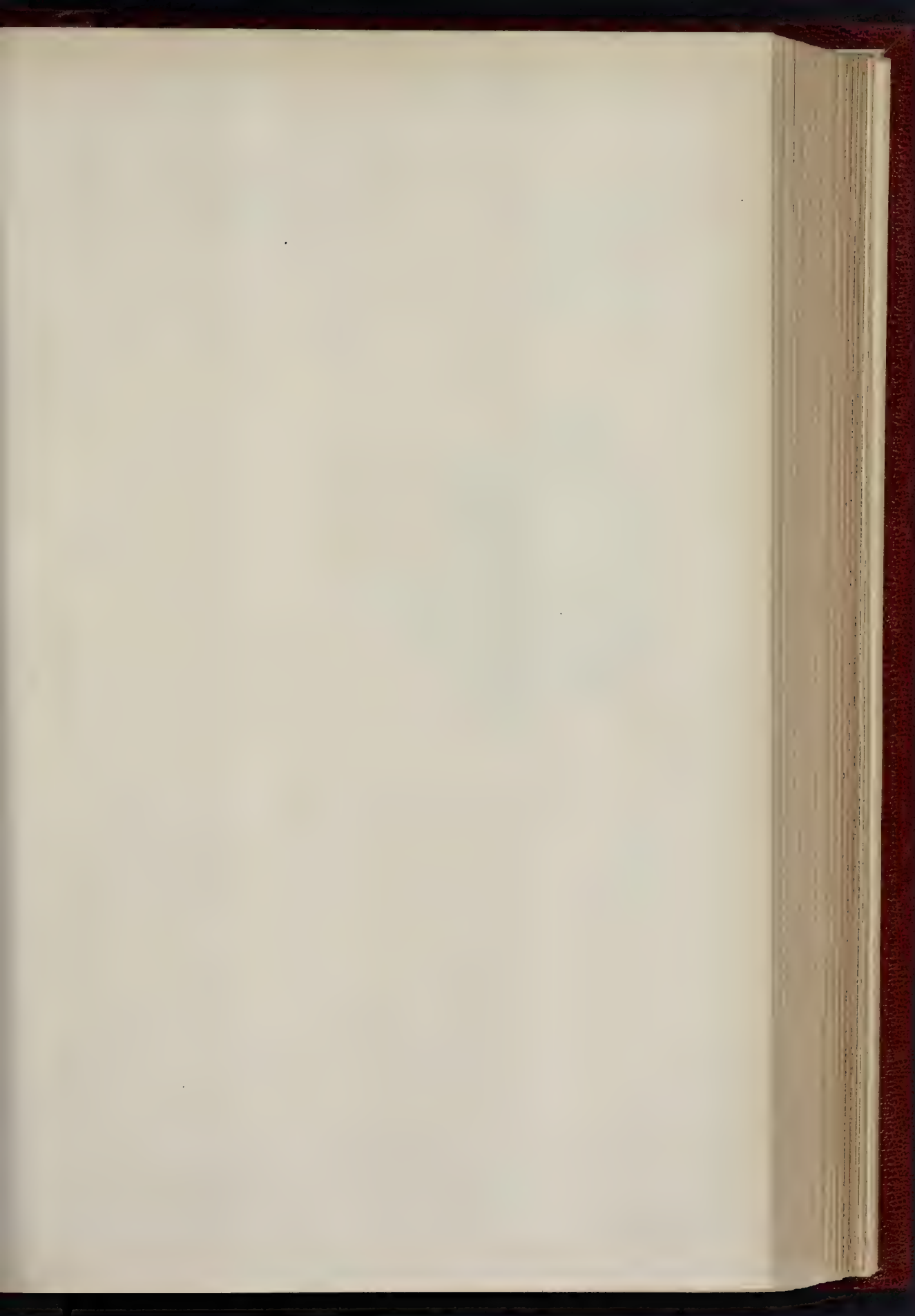
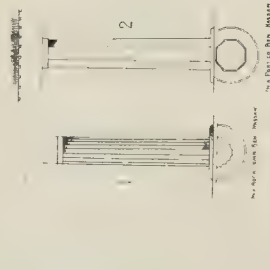
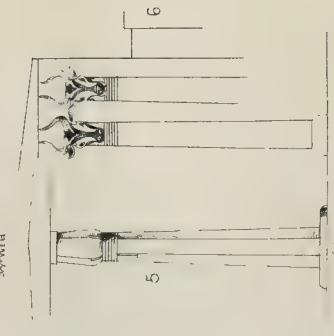
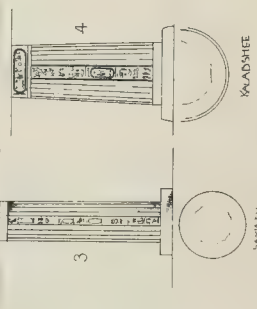


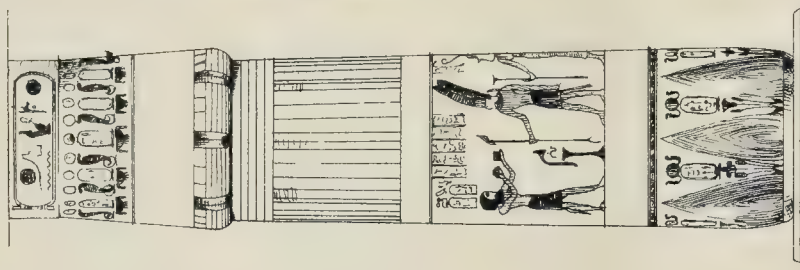
PLATE 4



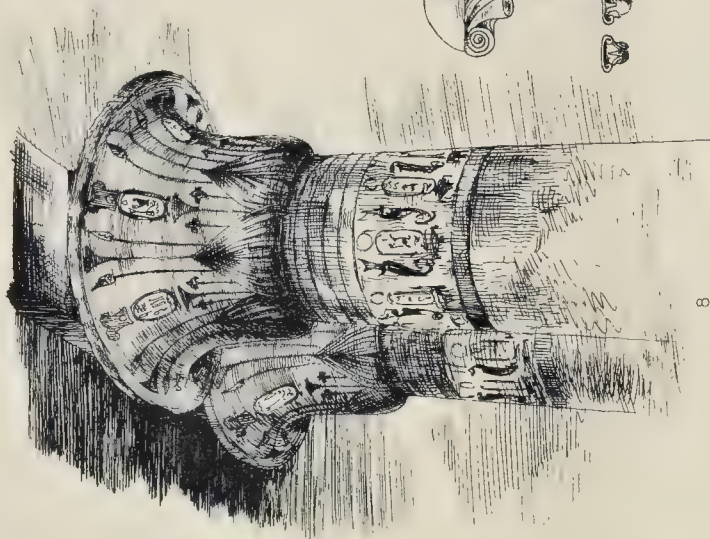
THE PART OF THE CAPITAL



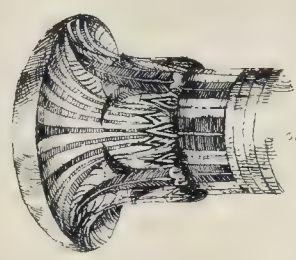
AT THE TEMPLE OF RAMSES II.



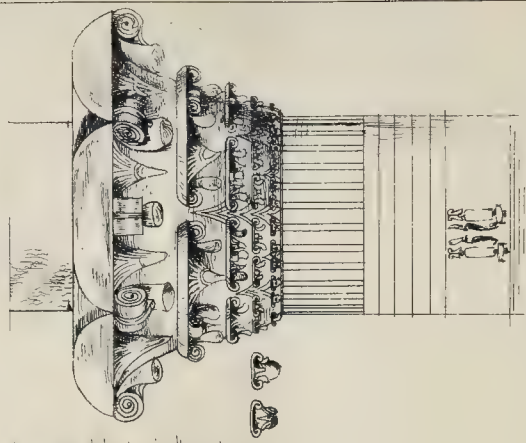
FROM THE LATERAL COLONADES OF THE TEMPLE OF RAMSES II.



FROM THE HALL OF ASSEMBLY IN THE TEMPLE OF RAMSES II.

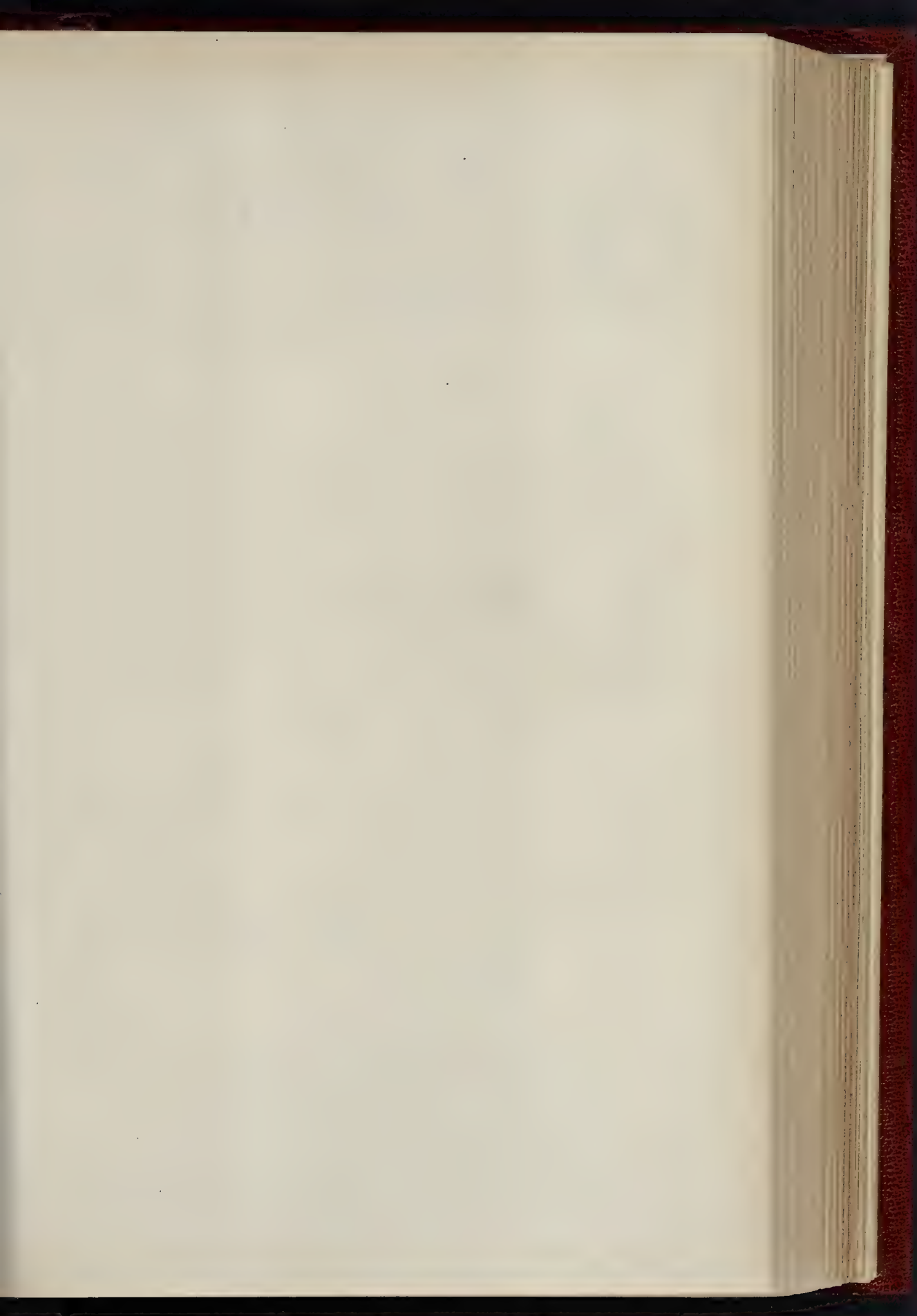


FROM THE PORTICO OF PHILAE



EDROY

COLUMNS and CAPITALS —
 illustrating second lecture
 by Mr R Sturt Poole
 on "Egypt at the
 Royal Academy" — Feb'y 14, 1884.



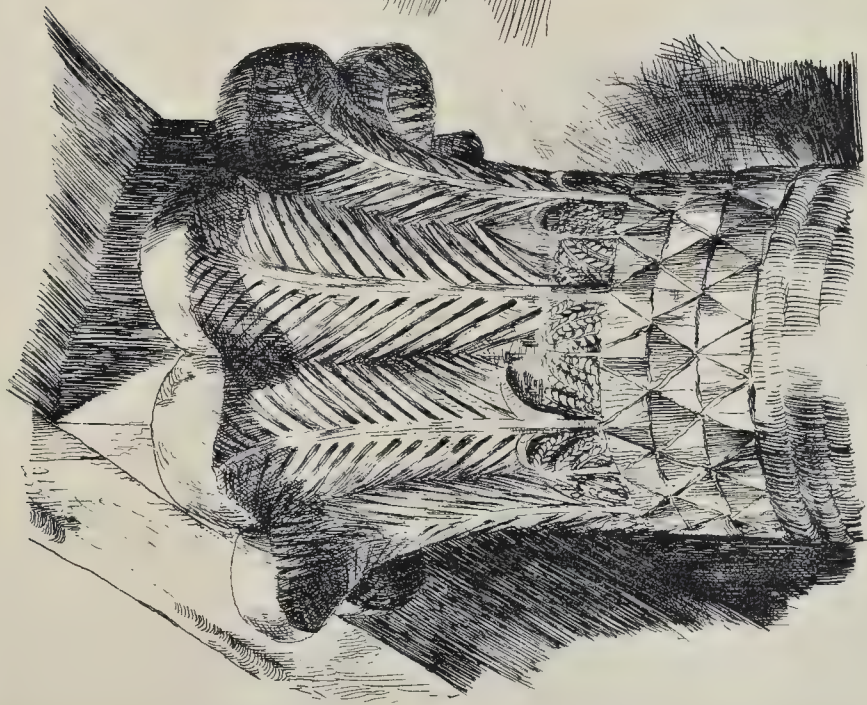
THE BUILDER, FEBRUARY 23, 1884.



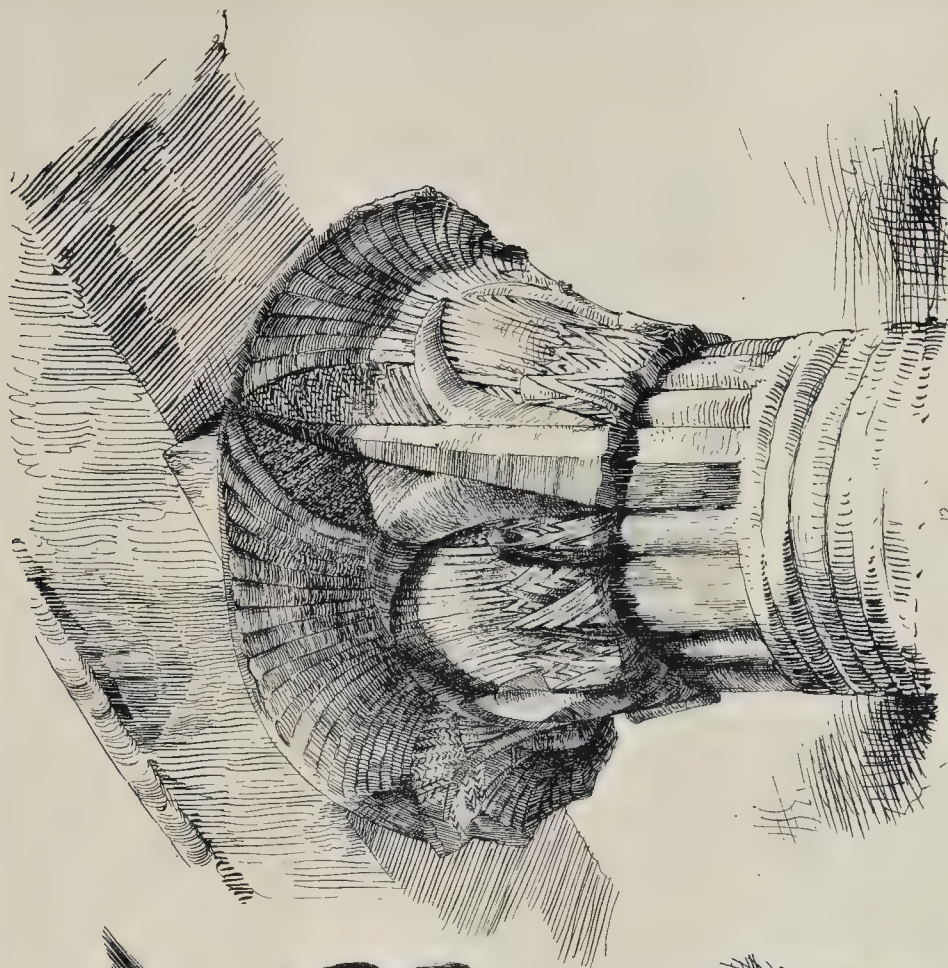


OFFICES AT SHEFFIELD FOR MESSRS. PAWSON & BRAILSFORD

MESSRS. HADFIELD & SON, ARCHITECTS, SHEFFIELD.



11

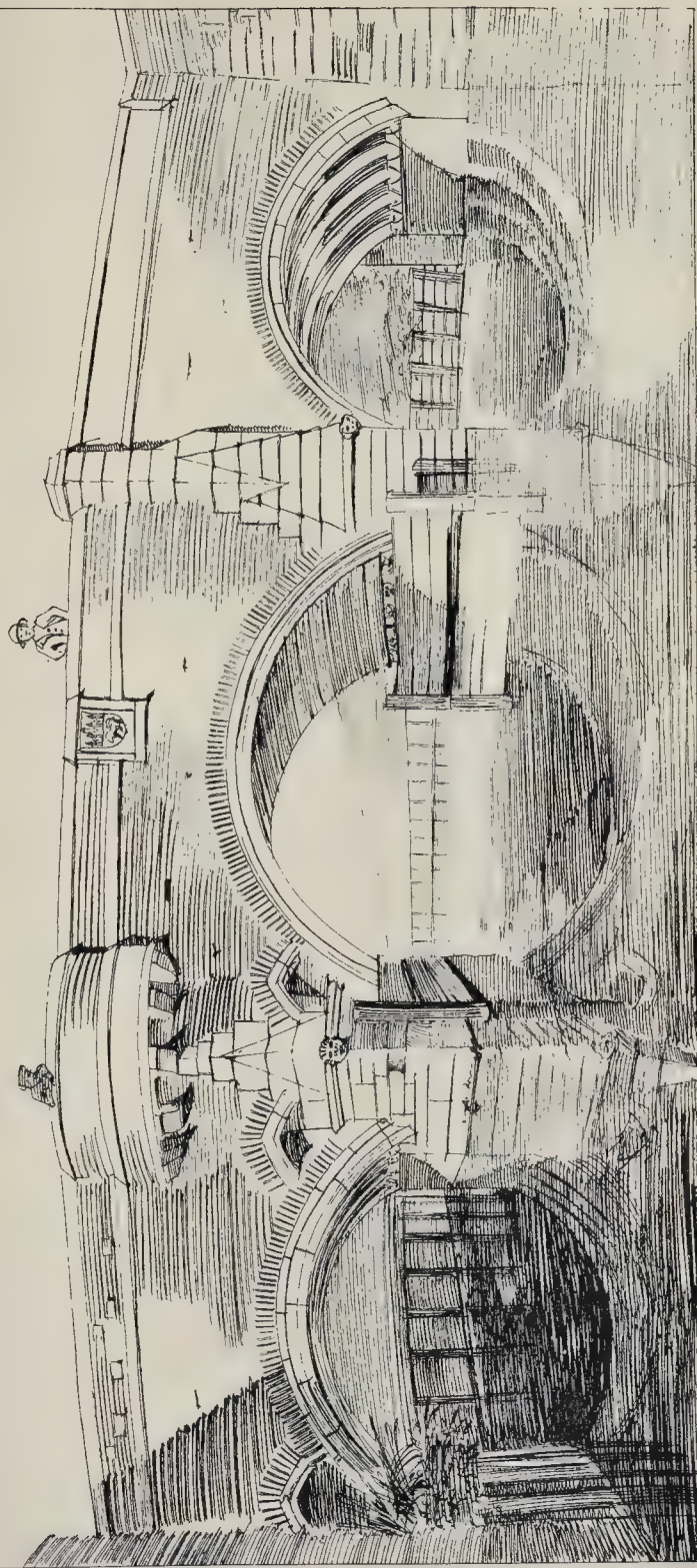


12

Capitals Philae. from sketches by R. Phénésiers F.S.A.

A Beresford Pile delt

1891. L. B. P. & R. P.

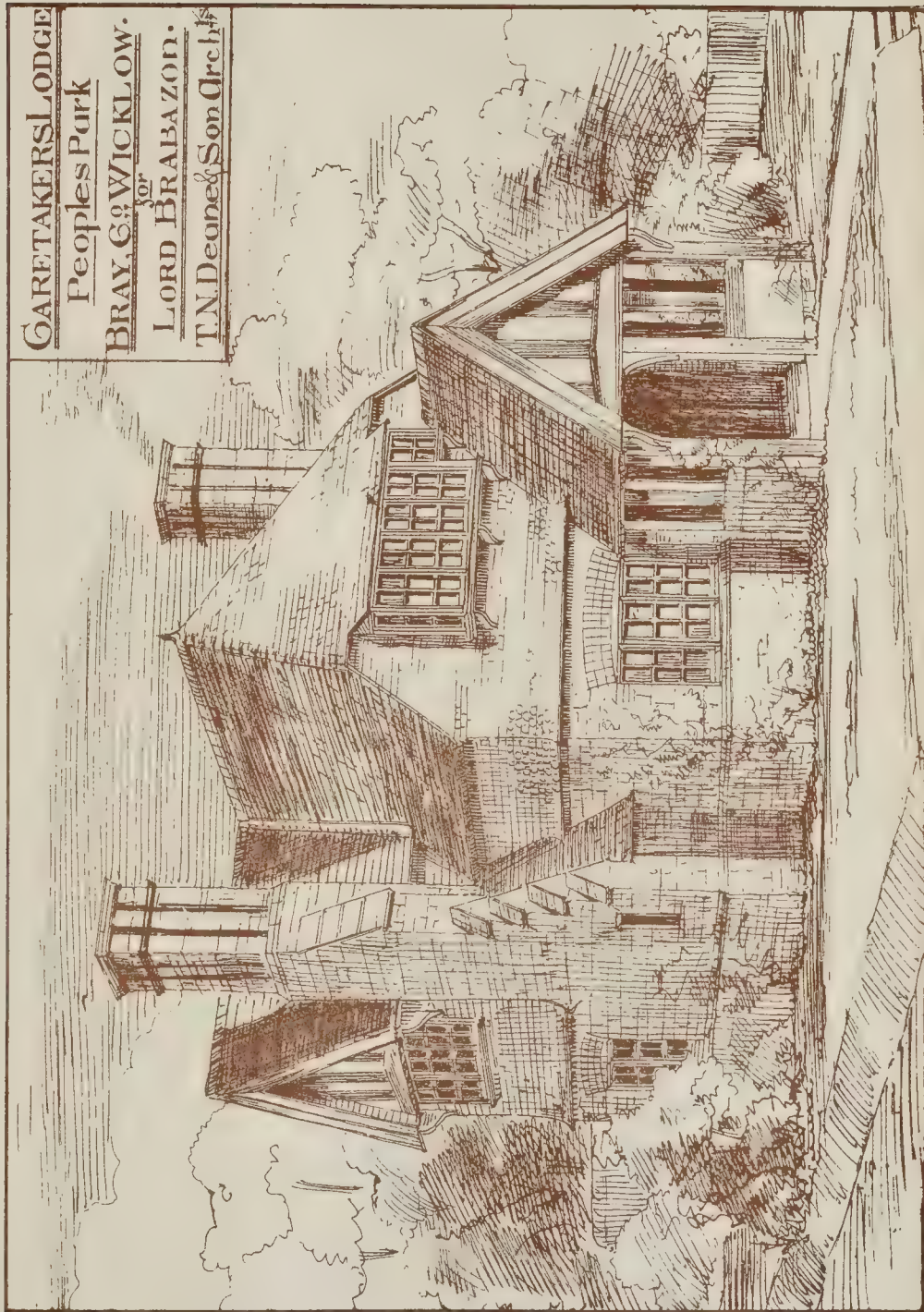


THE BISHOP'S BRIDGE, NORWICH.

R.I.B.A. *Pugin Travelling Studentship*, 1884.

J. GIBBONS SANKEY, DELT.

GARETAKERS LODGE
Peoples Park
BRAY, CO. WICKLOW.
for
LORD BRABAZON.
T. N. Deane & Son Architects



NEW PREMISES, CHURCH GATES,
SHEFFIELD.

We give this week an illustration of the above new premises now being erected at the corner of High-street and the parish churchyard, Sheffield, for Messrs. Pawson & Brailsford, the well-known printers, lithographers, and stationers. The site is, perhaps, the most commanding for business purposes in Sheffield, and great care has been taken to utilise every portion of the somewhat irregular plan, which we append to our illustration. On the ground-floor Messrs. Pawson & Brailsford's large shop will occupy the principal corner of the building, having one front to Church Gates and another to High-street. There are, in addition, two sale-shops fronting to High-street. The building has six floors, including the basement, which is commodious, dry, and well lighted. The principal floors are laid out in suites for offices for solicitors, accountants, &c., which are approached from East Parade. The buildings are constructed with Huddersfield stone and specially-made bricks from Fareham, Kent. The roofs are covered with green Westmoreland slate. The buildings were commenced last July by Messrs. G. Longden & Son, contractors, and it is anticipated that the first portion of the block will be ready for occupation about Midsummer next. A portion of the site is at present occupied by Messrs. Pawson & Brailsford for temporary premises; therefore the whole design cannot be carried out until their new shop is ready for occupation. The electric light has, we are informed, been used in Sheffield for the first time for building purposes by the contractors. Messrs. M. E. Hadfield & Son, Corn Exchange Chambers, Sheffield, are the architects, and the Clerk of the Works is Mr. George Webster. The carving has been entrusted to Mr. Frank Tory.

THE BISHOP'S BRIDGE, NORWICH.

The sketch of this effective piece of Mediæval bridge-building is an example of the work sent in by Mr. J. G. Sankey, who, as we reported previously, has obtained the Pugin Travelling Studentship for this year. It is a good specimen of pen sketching, true in line, and free in general effect. We purpose giving one or two more of Mr. Sankey's sketches submitted in the same competition.

GARDENER'S COTTAGE AND LODGE.

The views of these two small buildings are given as sketched by the architect, in a free but effective manner. Both are in Ireland. The gardener's cottage is at Balrath, Buiry, County Meath, and was built for Mr. C. A. Nicholson; the lodge is that built for the caretaker at the People's Park, Bray, County Wicklow, for Lord Brasenose. Both are pleasing examples of picturesque cottage architecture. They are designed by Messrs. T. N. Deane & Son, of Dublin.

MARBLE AND MARBLE MOSAIC.*

Of opaque coloured materials, marble is the most perfect, and it has also the merit of having the widest range of colour of any natural substance. Under marble I include all opaque stones that will take a polish,—limestones, dolomites, soapstones, porphyries, and serpentines; and I use the term opaque in its common sense, for not only is marble translucent, but all materials are when cut thin enough.

I have seen Faraday produce a beautiful green colour by letting light pass through a thin film of gold attached to colourless glass. Many of you have probably seen the windows of the cathedral at Torcello, glazed with some translucent stone, the alabaster windows at San Miniato, not to speak of modern windows glazed with Mexican onyx. What was the *lapis specularis* or *specularis* with which Roman conservatories were glazed? Was it really talc?†

Mr. Tadema has obtained beautiful and surprising effects by using as stained glass thin films of marble.

Marble, being one of nature's choice pro-

ductions, has many merits; it is strong, hard, and dense, will take the most delicate forms that are impossible in stone, and allow of this delicacy being seen. Much of the beauty of Greek work arises from the material used being marble; it takes a high polish, affords the least footing for dust, and is easily cleaned; it is variously and beautifully coloured, and, in many cases, its colouring has the highest attributes of nature's handiwork,—infinite variety,—for though we call one marble white and another black, and others red, yellow, grey, or green, it is almost always possible to find in a large slab a piece of the opposite or contrasting colour; in black, pure white; in white, pure black; reds in the greens, purples in the yellows, and in the variegated sorts which are the most common and more nearly convey the very notion of marble, we see an endless variety of tints and tones, and many varieties of colour. For this reason alone the use of marble is always the simplest means of getting good coloured effects; for nature has so varied its surface with vague but beautiful forms,—has given such sudden and brilliant surprises in the shape of contrasts, flowers, bands, stripes, patches, and spots,—that it is more than doubtful if the highest human skill can surpass them by painted ornament or coloured inlay. The lustre of the polish, the restrained tone of colour, the calm dignity of marble when used in large masses, is absolutely unapproachable.

Considering that there are forty different coloured marbles in the quarries at Siena, ranging from white to black,—that there are marbles in every division of the world's surface,—that in France alone about 600 have been already catalogued,—it would be quite impossible to give you the vaguest idea of their various merits in a lecture; but I may well dilate on a few of those that are commonly used in London, and on a few exceptional ones.

First, I may mention the imperial purples. You know imperial purple was of four kinds,—the amethystine; the Tyrian, of the colour of clotted blood; the Hyacinthine, or puce; and the crimson.

The first marbles in rank are the purple Egyptian porphyries, which are truly imperial from their fine colour, excessive hardness, and great durability; they will, moreover, take a polish like glass. Both purple and green Egyptian porphyry may be seen on Henry III.'s tomb in Westminster Abbey.

Lord Leonfield has two splendid table-tops of purple porphyry, formerly in Hamilton Palace. The altar-step of Lord Ripon's Church is of it, and plenty may be found in the Roman churches. In St. Mark's there is much, mostly stolen from the East by pious Venetians.

Still more splendid in colour is red serpentine mottled with dark green and black and flecked with gold, and no Imperial robe can exceed in splendour the dappled blood-red antique breccia of Numidia, nor the Grotte d'Italie, with its white veins and partridge eyes. The Rosso Antico, no longer antique since the quarries have been found in Greece, is of a deeper colour than the robin's breast, and looks as if light fingers had touched it here and there before the colour was dry; Languedoc, of a still more vivid red, powdered with flames of white; the Greek red, with fragments of pink and yellow embedded in it; the Cork red, speckled with white; the dusky red and grey of ronge royal; and red Devonshire. After these come the soft-coloured mottled yellowish-pink of Emperor's red and Verona; the deeper pink of St. Juan fretted with pinkish white; the brilliant Devonshire spa mottled with violet pink or brownish red; and the red-veined alabasters, of which the much-coveted alleys of our boyhood were made; but much more splendid alabaster is to be found in the English quarries, tinted with purple, not to speak of the pink granites and porphyries.

For yellows we have the lordly Siena, with its deep orange ground streaked with purple, veined with black, and here and there spotted with white; the pure yellow of Giallo Antico; the pale yellow of the Ivorio Antico of Numidia; the yellow Egyptian alabaster, with its eddying veins of white; Brocatello, which you may class with yellow or red, as in its fine brocade one or the other colour predominates; and the Rose du Var, light tawny yellow, with red marks.

Nearly approaching the yellows are some of the tawny marbles of Numidia, almost like skins of lions, glorified.

Of all the greens, some of the five Verd Antichi are the most splendid and the noblest. Corsi names them the clear, the dark, the grey flowered, the small flowered, and the emerald.

We may see the dull sort in inlays on chimney-pieces of the last century, and it harmonises more admirably with the creamy white of old statuary than any other inlay I have seen.

Perhaps the most superb of all is the one that looks like a field of emerald through which meander streams of milk white, a mere streak in some places, mixing with the green, inclosing small black lines and fragments, and spreading out into wide lakes with minute veins of the green passing them, and the whole taking a gem-like polish. A table-top of this may be seen at Dorchester House.

Next to these come Genoa green, that looks like a black delta, marbled by a thin snow-filled valley, cut through by pale green rivers full of black fragments; Greek green from Laconia, and the dark green Vert de Corse, Vert Maurin intersected in every direction with light green veins; the Campan Vert, like pinkish white almonds embedded in pistachio paste; the Campan mélange, of a full green streaked with red and flowered with white; the Cipollino, like a slice of green onion, though its name is said to be given from its smelling like an onion in the working; the Irish green, that varies from bold eddying streaks of dark grey, like Tartar clouds, to the pale yellow of spring leaves on trees in a water meadow, here and there interspersed with translucent spots of dark green, like seaweed seen through pools (fine specimens of the pale yellow green may be seen at the Geological Museum); the cool green marble of Anglesa, spotted with black and brindled with white; the green Egyptian and Irish porphyries; green serpentines, of which the dark bands on Italian buildings are made; the grey green and purple Purbeck and Petworth marbles, of which so many of the shafts in our Gothic cathedrals are made.

For white we have Carrara, Parian, and Pentelic, the blue-white Sicilian from Carrara too, but called Sicilian because it was first brought to England by the good ship *Scitia*; the white granites, and snow-white alabaster, the pale and the deep-veined white marble, the white pavonazzo and pavonezzetto, with purple veins and the peach-blossom, the three latter fit for a princess's boudoir.

For black, Nero Antico, Irish black, Belgian black, English black, black basalt, and black granite, though this latter is grey.

For greys, the grey granites, dove, Belgian grey, the lovely pale grey Bardilla, with its network of darker veins and black rivulets, and blue imperial.

For black and white we have Hachette and Grand Antique. A shaft of the latter still shows one bit, finely polished by the shoulders of the faithful, in a doorway at St. Mark's; Belgian blue, and Nero de Seravezza, both veined with white.

But perhaps the most splendid marbles are those which can be put into no category of colour, the different sorts of variegated breccias, and, if you will allow the word, bigaroon marbles, the pale fawn-coloured Caserta, diapered with crimson patches, sometimes small like vine-leaves, with creamy-white stalks and tendrils, and sometimes in masses as big as your head, nearly resembling the false jaspers. The violet breccias from Rondone, with large round patches of purple, red, grey, and yellowish white, bound with dark-grey and black veins; the breccia of Palermo in which fragments of white, dark-grey, and pale yellow are embedded in a morone cement; the gorgeous antique breccias of Africa, where large masses of black, bluish grey, and flesh colour are joined by large veins of blood red and jet black; the grey Sarrancolin veined with red; the dark brown breccia of Belgium with black patches and red spots; the breccias of Septimius Bassus, of one of which the late W. Burges had a frustum. And all the antique breccias of Numidia; the Egyptian breccia, in which green and purple pebbles of porphyry start out from a golden ground, to be seen at St. Vitale, Ravenna, at the Campo Santa, Pisa, and as slabs on Louis Quatorze furniture; yellowish white jasper, with flaming bands of red purple and yellow across them; the red and white striped African serpentines of inky blackness spotted with pink, and others like a serpent's back, olive, green, and creamy white; deep flesh-coloured, steel grey, red, crimson, pink, green, and black porphyries; white serpentine, with black spots like black

* From a lecture by Mr. G. Aitchison, A.R.A., delivered at the Royal Academy on Monday, the 18th inst.
† See Martial, epigram xiv., lib. 8.

peas on a table-cloth, and the deep brown and white Californian spa.

From these I have omitted the gems and precious stones, lapis lazuli and malachite, coral, onyx, agate, real jasper, chalcodony, and blood-stone, rock crystal and carnelian,—all of which may be found used in the altar-pieces abroad; and let me say that the Mexican onyx is as lovely in Mr. Tadema's windows as it is livid on a wall.

Thanks to Il Cavaliere Giovanni Battista we can see at the Natural History Museum many of the famed marbles of Numidia, and at the Geological Museum Corsi's slab, containing 1,012 specimens of antique marbles.

We want a Marble Museum, where we can find large polished specimens of all the known marbles in the world, so that when our people have shaken off their apathy for beauty we may see the riches we have to deal with. Supposing the building provided, it would cost but a trifle to form the collection. Every civilised country would be pleased to exchange polished specimens of their own marbles for ours.

It is not surprising that a people fond of stately magnificence, like the Romans, should have been so passionately fond of marble that the whole world was ransacked for the finer varieties, that the emperors should have taken some quarries under their special protection, and have almost restricted their products to Imperial use; that when a new and beautiful marble was found, a specimen should have been set up in the Forum and greeted by the people as with a triumph; nor that vast sums should have been lavished on the purchase of a single column. What does strike one as surprising is the utter insensibility to the beauty of marble that the English have shown. We may say that till quite lately the use of marble, beyond statuary, has been restricted to hall-floors, chimney-pieces, and the tops of wash-hand stands, if we except a few monumental slabs.

Most marbles lose their due effect when not used in masses. Their restrained tones harmonise with their own varieties; but when they are in small pieces they are obliterated by the general tone of fully-coloured rooms. This may be particularly noticed in the case of chimney-pieces, and has greatly tended to the frequent use of white, which truly attracts the eye, but destroys the harmony of the whole room; still, if the room be white, or some very light tone of colour, the richer coloured marbles may be used effectively as jewels. Polished marble harmonises badly with a rough or dusty quality, such as that of distemper or fresco, brick, and stone, but goes well with glazed tiles, burnished metal, polished woodwork, glass mosaic, and with the richer qualities of oil-painting. Even when using the fuller coloured marbles of one tone much moulding or ornament is thrown away, and it is positively ludicrous to use these when the marbles are richly variegated and of large figure.

I may here mention that though marble is one of the hardest materials it is also one of the most treacherous, and that almost all variegated and flowered marbles are full of flaws, cracks, vents, and veins and sand-holes; this does not much matter when the marble is used for casing or for columns that carry no weight, but when we build monumentally, discard iron and lath and plaster, and let our columns carry arches, vaults, and domes, no column should be used without careful examination and subsequent testing by the press.*

The New Pauper Lunatic Asylum, Exeter. The Town Council met on the 18th, and decided to accept the tender of Messrs. & Co., of Chudleigh, near Exeter, for the terra-cotta. The amount was 5,523*l*. There were six other tenders, which ran:

Jennings	53,553	3	3
Johnson & Co., Ditchling	6,239	15	0
Gibbs & Canning, Tamworth	5,316	0	3
J. C. Edwards, Beasom	4,491	0	0
Hatfield Station Co., Loughborough	3,625	16	0
Doulton & Co., Lambeth	3,625	0	0

the eighty applicants for the post of clerk of works (salary 3*l*. 3*s*.) Mr. D. H. Green, of Shrewsbury, was selected. The names of Councillors Harry Hems and George Packham were also added to the Building Committee. The general contractor is W. H. Phillips, of Exeter. His price is 56,200*l*. The architect is Mr. R. S. Wilkinson, of Furnival's Inn, London. Mr. Wilkinson is the son of the present Mayor of Exeter.

* Mr. Aitchison thanked Messrs. Boncneau, Burke & Co., Messrs. White & Sons, and Mr. Robinson for the loan of fine specimens of marbles to illustrate his lecture.

THE VENTILATION OF THEATRES.*

PARKES MUSEUM OF HYGIENE.

ANOTHER advantage of the *plenum* system I am advocating,—that depends upon an ample supply of air forced in rather than upon means of exhausting the vitiated air,—is that all those ugly cowlings, which you must have noticed as my special *bêtes noires* become needless. A tax ought to be put upon every such excrescence, in proportion to its size and unsightliness; and this tax should be quite prohibitive of all such monstrosities as those that disfigure the roof of St. James's Hall, and make London a laughing-stock to foreigners, who pay a little more attention to the beauty and skyline of their streets than we do to ours. We should then see the last of those metal pipes which obtrude from our roofs, looking as if they had sore throats wrapped round with comfortable "comforters," and which, in pretty little models, seem sometimes to extract air with marvellous ease, but which somehow generally fail to do so when most needed, as, for instance, when there is no wind to blow, or when it may happen to blow a little too hard.

The system is applicable, at moderate cost, to old theatres, as well as to new ones, and, of course, it is our oldest theatres that stand most in need of being ventilated, since most of them are but death-traps to all concerned with them,—audience and actors and supernumeraries. It would, perhaps, be invidious in me, who, as an architect, cannot have any interest whatever in any of the numerous patent and other inventions for ventilating appliances which are offered to the public, to specify which of them I should particularly recommend.

I am not able to speak much from personal experience as to the condition of theatres on the Continent, in regard to their ventilation, but I think it may be assumed that the general experience there is much on a par with that here. In the *Builder* (a journal which has always been a strenuous advocate for sanitary reforms) for Sept. 22, 1883, the following statement appeared:—

"As for the matter of ventilation, that also requires, in the interests of the public, most earnest consideration. There at least we have but little to learn from our Continental neighbours, who suffer in their theatres quite as much as we do in ours. The day that the last grand chandelier shall have disappeared from our theatres will be a memorable one in the history of the stage. Then at length a visit to the theatre will cease to be what it, at present, too often proves,—a singularly uncomfortable mode of enjoying one of the most instructive of all pleasurable relaxations."

We may, I think, turn with greater advantage to consider the attempts that have been made in America, where, necessarily, from its climatic extremes, the subject of ventilation has been much considered. This has been described in a paper by Mr. Arthur J. Gale upon American architecture, published in the *Transactions of the Institute of British Architects* for 1882-83. These seem to show that ventilation upon, as far as I can judge, the identical general principles carried out in the Madison-square Theatre in New York. Mr. Gale says that this is not a very large, but a very successful house. He then describes it as follows:—

"The fresh-air inlet is by a descending duct, 6 ft. square, lined with wood, in which is a conical cloth bag, 40 ft. deep, to filter the air, which afterwards passes over ice in summer, four tons being used each night, two tons before and two after the air passes the fan at the bottom of the inlet-shaft; this fan forces the air into a brick duct, from which sheet iron pipes lead it into four brick cases surrounding radiators that supply the required heat in winter. This fresh air, so regulated in temperature, is conveyed by 4-in. tin circular pipes to the four sections of ninety seats each, in the auditorium. Other special ducts supply additional cooled air, when needed, to other parts of the building. All the gaslights are enclosed in glass, and have ventilating shafts. By these and other exhaust-shafts the vitiated air is drawn off from various parts of the building by means of another fan in the roof. The footlights are ventilated by the same means. Tests have proved the case with which the system can be worked, and the excellent results which have been attained by it. The temperature, on one occasion at 3.30 p.m., was, outside, 85° Fahr.; in the delivery, just beyond the ice, 70°; and at the main outlet, 86°."

Having now cited this record as to the manner in which a theatre has been successfully treated, I need say no more in support of the

* A paper read by Mr. J. P. Seddon, F.R.I.B.A., at the Parkes Museum of Hygiene, Margaret-street, Regent-street, on Tuesday, Feb. 12. See p. 225, ante.

general principles that I have advocated. As to the special appliances which are required to carry them out in practice, they must necessarily vary according to circumstances. I shall conclude, therefore, with the recommendation to managers to give the thorough *plenum* system proposed a fair trial, and not to be content with half measures, and to be cautious not to allow themselves to be led, or rather misled, by the specious advertisements of patentees of particular appliances, the value of which, if any, depends entirely upon the manner in which they are employed. In all cases they would be wiser to place this class of work into the hands of a professional man in whom they have confidence and whose reputation would depend upon the success of the result as a whole, and who, of course, has no interest whatever in anything that would form merely part of the details of the general arrangement.

Since the foregoing was written my attention has been called to a description of another American example, that of the ventilation and warming of the Metropolitan Opera-house of New York, given in the *Sanitary Engineer* paper of that city for December 6th of last year. The system adopted seems to be exactly what I have recommended, and to have been confidently carried out by the architect, Mr. J. Cleveland Cady, and the ventilating engineer, Mr. Frederic Tudor. The principle involved is stated to be that of "*plenum* ventilation," the object being to have an excess of air entering the building to that which is leaving it by the regularly-provided foul-air outlets, the result of which is to have a pressure within the building slightly in excess of that of the air without the walls, so as to insure an outward current through crevices of doors and windows or accidental openings. To accomplish this in a practical manner a blowing-engine is used, and the supply of air is almost unlimited. There is a principal controlling valve to the ventilation in the centre of the dome-shaped ceiling of the auditorium. By the adjustment of this the pressure within the house is regulated, and the condition of *plenum* maintained under varying conditions of the speed of the fan.

In the Prince's Theatre, recently opened and built by Mr. Phipps, as at the Savoy, the basement, the most difficult portion of a building to ventilate, has been efficiently ventilated and warmed by the "*Æolus Water-Spray Company*." This system affords ample power to completely warm and ventilate any building, and no doubt there are others that can accomplish the same end. It remains for architects and their employers to make proper use of the means now placed at their command.

The comfort and health of the actors and *employés* at theatres would, no doubt, be very greatly enhanced if in their dressing-rooms, which, as a rule, are wholly neglected, and consequently in a parlous condition, a few simple precautions were taken, such as, indeed, should be adopted in rooms of all buildings. These are the provision of a supply of fresh air to every fireplace or stove, and the extraction of the foul air from the separate rooms by outlet ventilators into the smoke flues. There are numerous excellent appliances for this purpose in the market, such as Boyd's, Shillito's, and other ventilating-grates now generally used in school-buildings.

There are plenty of admirable appliances in this Museum and elsewhere for the construction of the several parts of buildings and for the consumption and extraction of smoke, but it seems to me that the public generally does not recognise their utility, which I think arises from the isolated manner in which they are separately brought into notice. It is to be hoped that in the forthcoming Health Exhibition at South Kensington this may be remedied. I may say that I am taking steps myself to give practical outcome to the opinions I have myself formed on some of these subjects by the assistance which has been kindly offered me by a firm (Messrs. Belham, of 155, Buckingham Palace-road), and I hope to be able to show that such practical requirements may be provided for without such an absolute sacrifice of the artistic, as we have become unfortunately too accustomed to, by the multifarious cowlings which now disfigure the majority of our buildings.

In the discussion that followed the reading of the paper,

The Chairman (Mr. George Godwin, F.R.S.) said the question of the ventilation of theatres was a very important one, as every person in

the room would admit, and therefore they were all obliged to Mr. Seddon, whether they agreed with all he had said or not, for having brought it forward. He would have liked to see some few managers and some few actors present, as they might have given the meeting the benefit of suggestions on the subject. It was not an easy one to treat. When the Opera-house in Paris was commenced, a Commission was appointed consisting of General Morin and the best men who had studied ventilation, to decide how the question should be dealt with, but after sitting for a long time the Commission broke up in despair, and it was left to Monsieur Garnier, the architect, and one engineer, to carry the matter through, and they arrived at the conclusion that little was to be done, except to open some large windows now and then; and, unfortunately, that was just what most of our managers of theatres did. He was unable to agree with Mr. Seddon that the new theatres in London were an improvement upon the old ones in this respect, for some of them were abominable (there was no other word for it). They committed murder. On the night of the opening of the Comedy, for instance, an acquaintance of his attended, and was in bed a month after with lumbago. At Covent Garden Theatre, during the pantomime, when the curtain was up, there was not a draught merely, but a high wind; and it would be impossible to say how many persons every night went away from the theatres with colds. In the dress-circle of Drury Lane Theatre the end door was always open, and the attendants did not care for any observations made about it. That these arrangements produced illness there could be no doubt. It was not pleasant to speak about these things, but the time had come when some one must speak about them. The new theatres were built with the back of the dress-circle towards the street, and when the street doors were opened the cold air passed through the dress-circle and other parts, and caused great mischief. He was afraid architects did not devote sufficient attention to this matter. They seldom or never attempted to warm the air even in the simplest way, as it might be warmed, before entering the theatre. Mr. Rice some years ago introduced fireplaces here and there, and in the staircases, with a view to produce some little amelioration; but they were utterly useless, owing to the unsuitable construction of the stoves. The better plan would be to make some provision for ventilation in the lower part of the house before the theatre had been completed. He was sure that something might be done,—in fact, something would be done, if managers were wise, because steady-going play-goers were gradually being driven away from the theatres more by draughts than by bad air. The *plenum* system which Mr. Seddon has spoken about would be excessively difficult even when constructed *ad initio*. Whether the electric light might enable the managers to lessen the draughts he did not know, but, at any rate, managers might devote attention to that subject. In so well-conducted a theatre as the Gaiety, in the upper boxes, there were windows which were opened at intervals, no matter what the temperature might be, by the attendants, who had their instructions to do so and could exercise no discretion. An enormous amount of annoyance was thus caused, and, so far as he knew, there was no attempt whatever made in front of the house in any theatre in London to avoid these dreadful draughts. Bad air was bad enough, and he had done his best to show that during the greater part of his life, but it was not so quickly bad as draughts. They might have met with the Hindoo saying that a draught was a serpent. The Hindoo knew well what a draught could do. There was a saying among English people about draughts:—"If you get the wind through a hole, Make your will and mind your soul." But bad air did not act so quickly, though it was bad enough. Our theatres as a rule,—and especially our new theatres,—were positively a disgrace. He did not wish to say a word against the able architects who had constructed them. They could not help it because they were tied down to spend only a certain amount of money, and limited by a little slip of land, often between two other houses, in which they had to place the theatre, and they had to do the best they could; but, in many respects, instead of being better than the old theatres they none of them approached Drury-lane Theatre; they appeared to be built only as a means of invest-

ment,—something which would bring so much money to the managers and actors,—for there never were such times as the present for lucky managers and clever actors. In consequence they had got this notion into their heads,—more than one had told him so,—that if it was a very good piece the public would come and be killed; and if it was not a good piece, however well they might ventilate and arrange the theatre, the public would not come at all. Therefore, it was time the public should look to themselves. Some were present who some years ago endeavoured to obtain for London one theatre at least which should not be wholly regulated by the prevailing popular opinion, and they hoped some day that that effort would have effect, and that they might have for the exhibition of their classical drama,—the finest and grandest drama, perhaps, of any country,—a theatre in which these deadly draughts might be prevented. He would ask the meeting to pass a vote of thanks to Mr. Seddon, and he trusted his excellent paper would lead to the matter being considered elsewhere.

Mr. Hermann Vezin agreed that there would be some difficulty in carrying out the *plenum* system, unless the machinery could be put on the roof, because the theatres, as a rule, were so small. The description given of the Madison-square Theatre in New York implied a larger space than the London theatres possessed. At one time he constantly urged upon managers of theatres the importance of ventilation, until at last they all told him it was a craze he had. He had that afternoon been to the Lyceum Theatre, and had come away with a headache, and probably most of the 2,000 people there had done the same. A remedy might be found, he thought, at comparatively small cost. There was a certain amount of truth in what had been said by the chairman, that the public "would go to the theatre and be killed," if there was an attractive piece; but he believed if the theatres were well ventilated, the public would go in larger numbers even to see a moderately good piece. He seconded the vote of thanks.

Mr. Helbb said that the *plenum* system had already been applied in one or two instances,—in one case to a theatre,—and had not been successful. It might be urged that in the case of a theatre the plan of the building was exceptional; but he had known the system tried in several large buildings, and the verdict was adverse. There seemed to him to be more chance of success in the natural system of admitting fresh air by conduits, and leading it to some large receptacle where it could be warmed, and then diffused by means of pedestals placed in convenient positions. The difficulty in regard to theatres was that they had to deal with several tiers; but that was one that might be got over by the natural diffusion of air brought into the building, and allowing the vitiated air to escape by means of the central gas-burners or other openings if they were required. But the first thing to consider was whether the public wanted such ventilation. He rather fancied they did not, or they would have cried out for it long ago. The foreign theatres were no better than the London ones in regard to ventilation, because the legislation was permissive; and the majority of the managers were content to warm and ventilate their theatres by means of the bodies of their audience. Such a system was, of course, disgraceful. Some twenty years ago it was resolved to apply scientific principles to the ventilation of the two theatres on the Place de Châtelet in Paris, but after a time it was found to be unsuccessful and was discontinued. In one of those theatres the cost was 5*l.* per seat and in the other 2*l.* per seat. No manager could be expected to incur so large a cost of his own accord, and therefore if the public required it they would have to insist upon it being done.

Dr. G. V. Poore suggested that in our climate the natural means of admitting air would, for the most part of the year, be sufficient; but in the modern theatre there was no place arranged for the admission of the air. It might, however, be admitted to the corridors outside the dress-circle where it would get warmed, and might thence be admitted through Sheringham valves to the dress-circle itself. He would like to hear the experience of actors of the effect on them of non-ventilation, and the effect it had on the voice. The cause of failure in our singers he believed to be due more to foul air than to draughts. People caught cold not so much through draughts as from being prepared

to catch cold by sitting in foul air for hours before they came into the draught. He thought the ventilation of theatres might be improved if managers would go to the expense of knocking out a few bricks from the walls.

Mr. Liggins said he had never been in a worse theatre than that in Madison-square, New York. In the two theatres on the Place de Châtelet in Paris, there was no attempt at ventilation. In the Paris Opera-house the ventilation never reached the audience, and he had made up his mind never to enter it again. He had been twice to the Savoy Theatre, but should have gone twelve times if it had been better ventilated. All the modern theatres in London were equally bad in that respect. It appeared to him the only system to be adopted was to introduce fresh air and draw off the foul air by artificial means. He believed there were too many systems of ventilation before the public, and the proper plan would be to fix, through the medium of this institution, on one of them,—the best one,—and then say, "This is the system that will ventilate a theatre."

The Chairman observed that it was bad enough to have windows opened and fastened, but they might sometimes be closed; but if they had bricks knocked out of the walls and holes left, which could not be closed, it would be much worse. He then put the vote of thanks to Mr. Seddon, which was carried.

Sir Joseph Fayer proposed a vote of thanks to the Chairman, and having heard the London theatres entirely condemned on the matter of ventilation, he thoroughly agreed in all that had been said. In regard to a resolution which had been proposed by a previous speaker as to the constructional defects of theatres, he hoped an opportunity would soon be found to reconsider it.

The vote of thanks, being seconded by Professor Hayter Lewis, was carried, and the proceedings terminated.

ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this Association, held on Friday, the 15th inst., Mr. Cole A. Adams, the president, occupied the chair.

The following new members were elected, viz., Messrs. B. F. Fletcher, H. S. Wood, J. G. Jones, W. T. Gargery, W. B. Dawson, J. D. M. Crawley, J. M. Watson, and F. W. Potter. Mr. J. D. Sedding was also elected, without the formality of voting, as a distinguished member of the architectural profession.

On the motion of the hon. sec. (Mr. Appleton) a vote of thanks was passed to Messrs. Ernest George & Peto for allowing the members to visit some new houses in Harrington Gardens, as mentioned in our last.

It was announced that the next visit of the members would take place on the 23rd inst. to the Albert Exhibition Building at Battersea.

Mr. L. H. Isaacs then read a paper on "The Local Government of the Metropolis, its Relation to, and Effects on, London Street Architecture."

The general argument of the paper was to the effect that the Local Governmental Authorities were not elected on any principle or method likely to lead to the selection of persons capable of dealing well with the architectural improvement of our streets, and that the results were as bad as might have been expected. The Holborn Viaduct had been a mistake to begin with, as the valley, in Mr. Isaac's opinion, ought to have been filled up bodily, according to the suggestion of the late City Architect, Mr. Bunning; and the buildings on the Viaduct, which had promised well, had subsequently got into the hands of building companies, who vulgarised whatever they touched. There was little or no improvement over the results obtained years before by Sir Robert Smirke in laying out Moorgate-street and King William-street. The Metropolitan Board of Works had done a great deal in street improvements, in the way of forming new streets; it was only when the new street came to be flanked with buildings that we had cause to complain of the sin of omission, in the absence of any control over the style of buildings erected, and the erection of dull, gloomy buildings, as in Victoria-street, Westminster, and of still worse and indeed hideous designs on other sites which had been acquired at immense cost. In contrast with this, again, we had made no progress for the better since Nash laid out Regent-street, which was superior in effect in this respect at least, that the height of the buildings was in a moderate proportion

to the width of the street, and did not block out all the sky from it.*

In the discussion which ensued, The Chairman said that the feeling which the paper left upon his mind was one of sadness, when they thought of the Slough of Despond into which the architecture of our great cities had fallen. All who had crossed the "silver streak" knew how much better these things were managed abroad. But Bumbledom could be traced everywhere in connexion with our statues and buildings. It was a most difficult thing to give a remedy for all this, and it seemed to be only possible under some autocratic form of government.

Mr. W. H. Atkin Berry, in proposing a vote of thanks to the lecturer, said that Mr. Isaacs, from his official capacity as Surveyor to the Holborn District Board of Works, was especially able to treat the question he had brought forward. He should like to have some further information as to the nature of Mr. Bunning's proposal for filling up the Holborn Valley.

The vote of thanks having been seconded by a member,

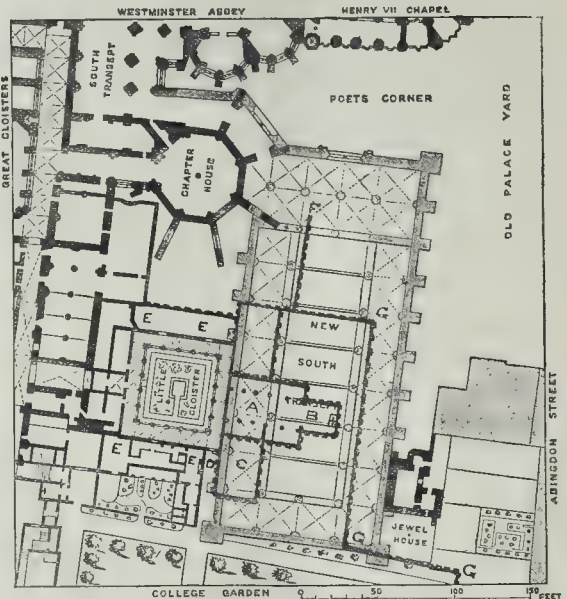
Mr. L. C. Riddett remarked that some of the statements of the lecturer seemed to point to the fact that the system of leaseholds was answerable for a good deal of the unsatisfactory character of London architecture. Whatever the municipal bodies wished to be done, they could only grant a lease for eighty years. The Building Act was also answerable to a great extent for cutting off, as it did, all picturesque projections, which were so charming in Continental cities. He had hoped that the "Queen Anne" revival would improve the façade of the streets, and if it had given nothing but red brick it would be much to be thankful for. A great deal more could be done with colour. The colour of the red brick lasted much longer when gauged, as in the case of the old Inns of Court, and where this was not the case it became a picturesque purple. The white Suffolk on the Holborn Viaduct were dreadful. Perhaps the crux of the question lay in the composition of the municipal bodies themselves, and doubtless Mr. Isaacs did not like to deal too strongly with their personnel. The laying-out of streets, and the formation of parks and boulevards, required the attention of cultured men, accustomed to take broad views, while unfortunately those elected to serve upon public bodies were oftentimes sent there principally to see that the rates were reduced. He did not look forward with hope to what any new municipality would do for the metropolis. If they were to have a body elected, much as the School Board were, by an enormous constituency, it would not improve matters. If London were to have a new municipality, he hoped that the nobility and gentry would serve upon it, and help to do something for the architecture of the metropolis.

Mr. C. H. Brodie referred to the overhead telegraph-wires, and stated that in the case of the new railway works under Whitechapel and Mile End, he did not notice any provision for pipes or wires being carried through a separate tunnel.

Mr. Hunter said that the great point was,—who was responsible for the present state of things as regarded architecture in the metropolis? It was generally admitted that the personnel of the local boards in London was not of so high a standard as could be wished, and he believed that absenteeism had a good deal to do with this. As a rule the inhabitants of any particular district did not take a personal interest in its government. Through the system of leaseholds there had arisen a divided interest in the class of buildings to be erected. Even in the case of Northumberland Avenue people would not submit to advice in matters of taste, and he could not see that any mere re-arrangement of the government of the metropolis would set things right. This could only be done by developing the public taste, which they must wait a long time for in this country.

The Chairman then put the vote of thanks, which was carried by acclamation.

Mr. Isaacs, in replying, gave some description of the state of the metropolis. He said that Mr. Isaacs seems to have forgotten that the increasing demand for space and consequent value of sites in London absolutely necessitate an increase in the height of buildings. We cannot spread out laterally much further,—we must go up vertically. The buildings in Victoria-street are certainly depressing and gloomy in effect, but it is not their height that renders them so. *Ad rem*, considering the demands on our space, we have felt obliged to decline printing in *extenso* a paper which, though pitifully expressed, only went to show that "whatever is, is wrong," without pointing out a remedy.—Ed.



Sketch Plan showing Medieval Buildings interfered with by Mr. Fergusson's Proposed Addition to Westminster Abbey.

of the manner in which Holborn Valley might have been dealt with by a general filling-up; and in regard to what Mr. Brodie had said as to the Whitechapel-road, and the provision for wires, said he would make a note of it, and make inquiries into the matter. With regard to what had been put down to the leasehold system, in every one of his cases, which were under the control of the Metropolitan Board of Works, the right was given to secure the freehold for a given number of years' purchase within a certain time. Therefore they had to look beyond the absence of freehold as causing those architectural disfigurements, and he could only suppose that the cause was the absence of that control to be met with abroad. Was there not some middle course which, while sparing them from monotony on the one hand, should save them from the disfigurement of the leading thoroughfares through the absence of proper control? He could not help repeating that over and above the interest they felt in this question as ratepayers, as architects they felt a greater interest, because it had a vital effect upon the architecture of the entire city.

WESTMINSTER ABBEY: PROPOSED "CAMPO SANTO."

SIR,—The letter from Mr. Fergusson on the above subject, published in your last issue, is one that cannot be passed over by those who care for the matchless interests, both archaeological and architectural, which centre in Westminster Abbey, and the venerable buildings attached to it. Mr. Fergusson's letter gains importance from the fact that it is the outcome of the proposal for "a monumental chapel" made by the First Commissioner of Works in a recent article in the *Nineteenth Century Review*.

That the Abbey is already overcrowded with monuments cannot be denied, and any scheme which may provide room for time to come without the destruction of things built by our ancestors in time past is deserving of the fullest consideration.

The schemes of Mr. Shaw-Lefevre and of Mr. Fergusson are, however, of the most destructive character. It is true that the parts of the monastic buildings which they condemn are not seen by every Cockney who visits the Abbey. When, however, a professed archaeologist like Mr. Fergusson seems practically ignorant, or

certainly careless, of these interesting fragments, the matter should not pass in silence.

To Mr. Fergusson's plan, published last week, I have added, with a serrated line, the Medieval buildings which would be destroyed by the scheme. Some parts of these buildings remain absolutely entire, other parts in fragments, and of some portion we have left but the foundations. I must explain the lettering:—

A. The nave of St. Catherine's Chapel, which was the chapel of the infirmary.

B. The chancel, with the altar still *in situ*. Considerable portions of the chapel are complete; parts are incorporated with a "second-class residence," to use Mr. Fergusson's words, whatever they may mean.

C. The Infirmary Hall. This building is absolutely complete, including its roof. It, too, is incorporated in one of the "second-class clerical residences." The hall is in all respects as interesting to those who have any acquaintance with the subject as the Jerusalem Chamber or the College Hall.

Canon Prothero would have his "second-class residence" about his ears, as it lies to the east of the hall. It is not shown on the plan as it is not Medieval, but it has about it much good post-Reformation work.

D. The slype, or passage, leading from the Infirmary Cloister (marked on the plan as the little cloister) to the College garden. This is the old passage-way, and would be destroyed in constructing the so-called "New South Transept."

E. E. The houses surrounding the Infirmary Cloister. These were originally a series of small houses for the aged and infirm monks who lived under a relaxed rule. The doorways to the respective houses remain, and a considerable amount of the Medieval work is incorporated in the existing residences, which, in their present form, are as much a part of the archaeological and architectural growth of the Abbey and its buildings as were the original houses.

Those only on the north side of the Little Cloister are condemned by Mr. Fergusson. Not less, however, than five residences in all would be done away with by this scheme, and at least three by that of Mr. Shaw-Lefevre.

One interesting old house has just been pulled down by the school. Ashburnham House was not far from suffering the same fate. Can we spare more?

Where, too, are the occupants of the five houses to be placed?

Mr. Fergusson will leave us an Abbey, and

* *The Nineteenth Century*, No. 83, January, 1884, p. 47.

unlimited accommodation for the illustrious dead of the future; but there will presently be no man left to bury them, or serve the church.

F.G.G. The boundary-wall inclosing the Abbey and its garden now existing.

SOMERS CLARKE, F.S.A.

Feb. 16, 1884.

SIR,—Will you allow me to rectify a misconception you have inadvertently fallen into in the remarks you made on my proposed addition to Westminster Abbey in your last issue.

You express surprise that I should advocate a sham wooden vault for such a situation; but this is exactly what I have not done. It is true I have frequently spoken in disparagement of the wooden roofs, which are only too frequently found in our Mediaeval cathedrals and churches. But it has always been with reference to those you deprecate so strongly, which simulate stone vaulting. On the other hand, I have always admired and spoken with praise of those wooden roofs which are formed with trusses or panels, in forms appropriate to timber construction. I believe them to be among the most beautiful and certainly the most characteristic features of English Mediaeval architecture.

In the present instance I proposed a roof composed of six hammer-beam trusses. It is so represented in the woodcut which accompanied my letter, and far as a plan can express such forms, and to make my meaning clear I referred, in my letter, to the roof of "the neighbouring Hall." A reference to its beautiful roof was, I thought, sufficient to explain what I meant. But what I really had in my mind was the beautiful roof, which, I believe, once adorned St. Stephen's Chapel, from which, I believe, the roof of the Hall was copied.* It was, I believe, the gem of English Mediaeval art, and if any architect could now succeed in restoring it, in any church or chapel he is building, he would do more to illustrate the perfection of the art as it was practised in England in the best age, than by any means I can conceive.

What I proposed was that this should be attempted in my suggested addition to the Abbey, and if carried into effect with even a moderate amount of success, it would, I believe, be a far more beautiful and appropriate form of roof than such a stone vault as the late Mr. Street has erected in the New Law Courts, and might be made quite as permanent. Without its wooden covering a stone vault is a singularly unstable affair, as so many of our ruined abbeys can testify.

JAS. FERGUSON.

20, Langham-place, Feb. 18, 1884.

* On looking again at Mr. Fergusson's letter, we perceive that we did unintentionally misrepresent him about the wooden "vault," but our main objection, to the employment of wood in a monumental chapel, remains. If, with all our modern resources in construction and materials, we cannot devise a stone vaulted roof which will be waterproof without a wooden bonnet over it, we ought to be ashamed of ourselves.

PIPES v. FAÇADES.

SIR,—In anticipation of the coming Health Exhibition, I venture to ask if architects and "sanitary engineers" can do nothing to prevent the disfigurement of so many of our best buildings by the affixing to them of ventilation-pipes of the most pronounced character? The pipes, led directly out from lavatories and closets into the equally prominent vertical soil-pipes, have long been a repulsive eyesore, but this evil is now increased by the new fashion of ventilating the drains of each house by means of the lead or zinc tubes, which the working plumber recklessly affixes to the most ornate architecture, and carries up on high to compete with the terrific abortions which the "smoke doctor" erects as the crowning glories of metropolitan architecture.

I say nothing against the utility of the contrivances, but I protest loudly against the supreme disregard of the most elementary æsthetic teachings, by the way in which these sanitary needs are supplied. It is surely a proof of bad construction, or probably bad design, when a chimney, *professedly* complete for its function, smokes so desperately as to necessitate two or three yards of straight or wondrously zig-zag tubing, terminated by a mysterious whirling cap being stuck upon it, no matter to what order of architecture the chimney may belong.

Need it be urged again, that every architect ought to study the subjects of heating and ventilation, and then, having regard to the surroundings

of the buildings, design his chimneys so as to carry clearly away the little smoke which his improved fire-grates may generate? Or, in the case of badly-constructed old buildings, if a lengthened flue be necessary, it ought to be provided according to fitting architectural design in a suitable material.

As to the ventilation of drains, if the public drains are not ventilated as they should be by the authorities, by means of a furnace and shaft, then the architect should provide proper channels easily accessible, in which to place the pipes; but where this cannot be done, it might be possible, in some way, to disguise them, or hide them away in an out-of-sight angle.

It is a standing reproach to our private and professional taste that the owners of property should permit, and the designers of these contrivances perpetrate, such outrages on the canons of good taste and beauty, and we look to the teachings and practice of our professional architects to counteract this fast-spreading evil.

BELSIZE.

CARPENTRY EXHIBITION.

SIR,—The letter in your issue of the 16th inst., signed "Henry Dunkley," raises quite a different point from that in his first letter, and my answer was only in allusion to his complaint of the value of the prizes offered in our exhibition.

I have not the time, and entirely decline, to discuss his present charges. It is not my province to defend the action of my own or the other City guilds, but I would only say that Mr. Dunkley is evidently quite unaware of the large amount of good work which has been done by them for many years.

This exhibition entails a very large amount of correspondence upon me, a considerable portion of which is with the class of artisans whose interest the companies earnestly desire to promote, and I am happy to say that, judging from their letters to me, they view the matter in a very different light from Mr. Dunkley, and it is for him to consider whether he chooses to exhibit.

So far as I am concerned, this must end the correspondence. STANTON WM. PRESTON.

Carpenters' Hall, London Wall, Feb. 18.

"IRON UNDER TEST."

SIR,—The article in your last issue on "Iron under Test" contains, I think, a misapprehension. The cause of the difference in the percentage of ultimate extension is that at the point of fracture of a test piece the sectional area gradually diminishes, thus confining the extension (after the diminishing in sectional area becomes perceptible) to within a short distance of the point of fracture. Although I am not practically acquainted with testing, I believe that whether the test piece is long or short, the length of the part which exhibits this diminution in area is approximately constant. Hence the stretching may, for one part of the test, be distributed over the whole piece, but as soon as drawing down begins, the stretching will be localised, thus vitiating percentage results. As I understand your report of Mr. Hackney's paper, the thing to which he called attention was that the percentage of stretching in pieces having different ratios of length to sectional area was not a measure of ductility. This would not affect the breaking strain.

J. W. C. A.

MURAL PAINTINGS.

SIR,—Will you allow me to state with reference to the process of producing permanent mural paintings, which was the subject of my paper at the Society of Arts last week, that I shall be very happy, as M. Keim's representative in this country, to give artists or others who may be interested in it every facility for making a practical acquaintance with the method.

J. A. RIVINGTON.

32, Eardley-crescent, Earl's-court, S.W.

THE NEW STREET IN THE CITY.

SIR,—The widening of Eastcheap and Tower-street with the spur leading into Trinity-square has formed a noble street, but if this street is to be of any service to the east end of the town it should be continued to the Minorities, and thence to Allie-street, so as to form a junction with Leman-street and the Commercial-road.

If this were done it would form a continuous street from the points through the City to the West End, and thus relieve Whitechapel, Aldgate, and Fenchurch streets of the traffic which now passes through them to go to London Bridge, Cannon-street, and Upper Thames-street.

Aldgate and Fenchurch streets are totally inadequate to the present traffic, and on three days a week Whitechapel and the adjacent streets are blocked up with hay-carts. These facts render the question well worthy of the attention of the authorities.

A. & H.

* * * Want of space this week compels us to defer several important letters.

COMPETITIONS.

Llanelli Hospital.—The Governors of the Llanelli Hospital advertised for plans for a new hospital in November last, to which about twenty-seven architects responded. The Governors selected a few designs out of the number for reference, the referee being Mr. Salter, F.R.I.B.A., of Woburn-place. He placed the designs in the following order of merit:—1. Mr. E. M. Bruce Vaughan, Cardiff; 2. Messrs. Wilson & Dyer, London and Swansea; 3. Messrs. James, Soward, & Thomas, Cardiff. He recommended Mr. Bruce Vaughan to be employed as architect, and the committee, at their meeting on Monday last, gave him instructions to proceed with the work.

St. Philip's Church, Southport.—We are informed that out of upwards of fifty-three sets of plans submitted in competition for St. Philip's Church, Southport, Mr. R. F. Lobson's, of Manchester, were awarded the first premium of 25*l.*; and those of Messrs. Barry & Son, of Liverpool, the second premium of 10*l.*

Books.

Manchester Ship Canal. Description of the Project now before Parliament, with Maps. Published by the Provisional Committee, Manchester. 1884.

ALTHOUGH the project of a Ship Canal from Manchester to the sea has now been for more than eighteen months before the public, the inhabitants of London and of the southern and western districts of England have but little acquaintance with the details of a scheme which has excited extraordinary interest in the centre of the manufacturing districts. No proof of the different views of local, and even of national, interests which are habitually taken by the inhabitants of different districts of our island could be suggested as more striking than that which may be afforded by a trip from London to Manchester. What in the Metropolis is only indifferently regarded, if spoken of at all, as one of the railway or canal enterprises for which Bills are deposited for the Session of 1884, is regarded by the great mass of the manufacturers and merchants of the wide district of which Manchester is the capital as a question affecting the very existence of an enormous mass of industry. The population now packed within a radius of forty-five miles of Manchester amounted to more than 7,000,000 souls in 1881. And, rightly or wrongly, the great portion of the working population of this part of England is giving practical proof that they believe their welfare to be closely bound up with the opening of the cheapest possible route from Manchester to the sea.

In the *Builder* for the 24th of June, and in that for the 8th of July, 1882, will be found an account of the general features of the communications now existing between Manchester and the sea, together with a summary of the objections against the original scheme of a canal without locks from the former city to the ocean. As to this, the Provisional Committee saw reason to change the first project; and in November, 1882, they deposited plans for a semi-tidal canal, with three sets of locks. Some difficulty arose as to the best mode of dealing with the improvements in the tidal estuary of the Mersey, which formed an essential part of any scheme for admitting large vessels to Manchester; and although the promoters of the scheme laid before the House of Commons Committee the formal support of the Conservators of the Mersey, one of the most influential public authorities in the kingdom, it was held that the technical requirements of the Standing Order of Parliament had not been fulfilled, and the Bill, having been much cut down in the Commons, was finally lost in the Lords. In coming a second time before Parliament, taught by experience, the promoters have not only supplied six or seven gaps that were pointed out in their former scheme, but have taken measures to inform the public of the main features of the enterprise, commercial, financial, and engineering, by the issue of a clear and well-written pamphlet.

The works of the undertaking comprise the canal from Manchester to Runcorn, the works in the estuary, the docks, and the railway diversions and branches. The total length of the canal proper is 21½ miles, which is divided

* History of Architecture in all Countries, vol. ii., p. 177.

by four sets of locks and sluices into five pounds. The width of the canal at bottom is 120 ft., the depth 26 ft. This is the depth of the Suez canal; and the width is 24 ft. less than that specified in the original contract for the Suez canal, and 48 ft. more than the actual minimum width of the same. The locks will be three in each set, one 550 ft. by 60 ft., one 300 ft. by 40 ft., and one 100 ft. by 20 ft. The fall varies from 8 ft. to 15 ft., amounting to 50 ft. 6 in. in all. Gaugings of the water flow show that there is ample, in the driest season, to pass 175 vessels, of an aggregate tonnage of more than 10,000 tons, per day; the actual traffic of the Suez canal being under ten vessels per day. At Barton the ship canal will be connected by hydraulic lifts with the Bridgewater canal. There will be swing-bridges at Barton, Warburton, Latchford, and Warrington, to be worked by hydraulic power.

The area of the Manchester dock will be 67 acres. At Warrington the present channel of the Mersey will be converted into a dock of 20 acres. There will also be a coal-loading basin at Partington. The five railways that cross the canal will be carried over high-level bridges, to each of which the rise is on an incline of 1 in 132.

A channel through the estuary of the Mersey is to be maintained by means of training walls for a distance of ten miles, from Runcom to Garston. The depth will be 12 ft. at low water spring tides, which gives 40 ft. at high-water spring tides. At neap tides the corresponding depths are 20 ft. and 32 ft. The width will be 300 ft. at Runcom, gradually increasing to 1,000 ft. at Garston.

The estimate is as follows:—

Canal.....	£3,930,171
Estuary works.....	1,390,419
Docks.....	1,121,232
Railways.....	456,172
Roads.....	16,162
Total.....	£6,904,156

This includes an allowance of 10 per cent. for contingencies over fair contractors' prices. It is estimated that the canal may be completed in four years.

On a traffic of 10,000 tons of cargo per day, (which is only a third of that of the Suez Canal), a charge of 5s. per ton of goods would yield a revenue of 750,000l. per annum. On this, 15 per cent. is allowed for working expenses, amounting to 112,500l., or 3,600l. per mile. The working costs of the Suez Canal for 1882, deducting social charges and administration, were only 2,654l. per mile (see *Builder* for Oct. 20, 1883) or a little under 9d. per ton gross of shipping for the entire transit. The figures given in the pamphlet show a net return of nearly 7 per cent. on eight millions of share capital, plus 2 per cent. on two millions of loan capital. But if we take the traffic and cost of working of the Suez Canal as a guide, it would seem that the estimate of the promoters as to income is far under the mark. Seven millions of tons, which is under the actual Suez traffic, at a penny per ton per mile, or say 2s. 8d. for the distance from Garston to Manchester, amounts to 933,000l. per annum. Fifteen per cent. on this (being one and a half times the cost of the Suez working expenses) comes to 140,000l., leaving a net profit of 793,000l., or 7.93 per cent. on 10,000,000l. of capital. Thus the charge of 5s. per ton can only be regarded as provisional, until the growth of traffic is such as to allow a considerable reduction.

In future editions of this useful pamphlet we hope that the last paragraph on p. 45 will be omitted. It is the only thing that we have found wrong in the book; and it very likely was taken from what was regarded as good authority. But as it stands, it may discredit the more accurate statements. It is not the case that the capital of 24,000,000l. for the Panama Canal was over subscribed in a short time. The estimate for that canal, made by the engineer of the Suez Canal, was 42,800,000l. The total capital, of which half has been called up, was fixed at 12,000,000l. The possible revenue, at the mileage rate of the Suez Canal, according to the calculations of Mr. Nimmo, the chief of the Bureau of Statistics at Washington, is about 406,000l.,—enough to pay the line to be made. It is better, in dealing with a serious matter like the Manchester Canal, to steer clear of imaginary statements.

MEETINGS.

SATURDAY, FEB. 23.

Architectural Association.—Visit to the Albert Exhibition Palace, Battersea Park. 3 p.m.
London Sanitary Protection Association.—Annual Meeting. 4 p.m.

MONDAY, FEB. 25.

Royal Academy.—Mr. G. Aitchison, A.R.A., "On Colour applied inside Buildings: Stained Glass and Painting." 8 p.m.
Society of Arts.—Mr. R. W. Edis, F.S.A., on "The Sanitation, Lighting, Heating, and Ventilation of Town Houses." (Cantor Lecture.) 8 p.m.
Surveyors' Institution.—Mr. R. Woolley on "Agriculture." 8 p.m.
London Institution.—Dr. E. B. Tylor, F.R.S., on "The Three Sources of History,—Records, Monuments, and Social Laws." 5 p.m.

TUESDAY, FEB. 26.

Builders' Clerks' Benevolent Institution.—Annual General Meeting. 7 p.m.
Institution of Civil Engineers.—Mr. Sydney W. Barnaby on "Hydraulic Propulsion." 8 p.m.
Royal Institution.—Dr. Archibald Geikie, F.R.S., on "The Origin of the Scenery of the British Isles." 3 p.m.

WEDNESDAY, FEB. 27.

Civil and Mechanical Engineers' Society.—Mr. C. H. Cooper, A.M.I.C.E., on "Chalk Water." 7 p.m.
Society of Arts.—Mr. G. Swinburne King on "Internal Corrosion and Scale in Steam Boilers." 8 p.m.

THURSDAY, FEB. 28.

Royal Academy.—Prof. C. T. Newton on "The Monuments of Ancient Art which have been discovered since 1850." 8 p.m.
Society of Antiquaries.—Mr. A. G. Hill, F.S.A., on "The Ecclesiology and Architecture of some Towns in Mecklenburg and Pomerania." 8.30 p.m.
Society for the Encouragement of the Fine Arts.—Mr. C. Foundes on "The System and the Meaning of the Art of Old Japan." (Sir P. Cunliffe Owen in the chair.) 8 p.m.
Society of Engineers.—Mr. J. W. Wilson, jun., on "The Work of the Patten shop and Foundry." 8 p.m.

Society of Telegraph Engineers and Electricians.—(1) Mr. B. W. M. Mordey "On Some Prejudicial Action in Dynamo-machines." (2) Prof. G. Forbes "On the Effects of Induction in Alternate Current Machines." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Prof. Silvanus P. Thompson on "Recent Progress in Dynamo-Electric Machinery." 8 p.m.
Parkes Museum of Hygiene.—(1) Dr. H. C. Bartlett on "Principles involved in the Purification of the Air in Living Rooms, Sick Wards, &c." (2) Dr. Richard Neale on "How to secure Pure Air, independent of Ventilation, without Draught, and of a regulated temperature." 8 p.m.

Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigators." 3 p.m.

FRIDAY, FEB. 29.

Architectural Association.—Mr. F. E. Eales on "The Arrangement of Buildings in Flats." 7.30 p.m.

Royal Institution.—Prof. D. E. Hughes, F.R.S., on "The Theory of Magnetism." 9 p.m.

Miscellaneous.

The Competition for the Victor Emmanuel Monument, Rome.—At the second competition for this monument, to which we referred in the *Builder* of January 26, the design of Signori Sacconi, of Rome, and Manfredi, of Piacenza, and Herr Schmitt, of Düsseldorf, have been awarded premiums of 10,000 lire each. The three successful competitors have also received each 5,000 lire for preparing the clay models. After the execution of the latter, the artist whose work is placed first will be charged with the execution of the monument.

The Metropolitan Board of Works have just approved the plans and specifications and sanctioned the erection of two large blocks of artisans' dwellings on vacant land abutting on Gun and Flint-streets, Southwark. When completed the dwellings will give living and sanitary accommodations for nearly thirty families. The designs were prepared by Messrs. Careless & Walker, architects, of Bloomsbury. Messrs. Nathan Bros., of Sutton, are the builders.

The Winner of the Godwin Bursary this year is Mr. Frederick Richard Farrow (not Farrell, as erroneously stated in our report of the proceedings of the Royal Institute of British Architects a fortnight ago, p. 211). The number of candidates for the Bursary was six, not thirty-six.

Edinburgh.—The Abbey Parish Church was re-opened on Sunday after undergoing considerable renovation and decoration. The most of the work has been bestowed on the wall behind the pulpit, the centre of which is occupied by the illuminated organ, placed in a large arch. On each side of this arch a painted reredos has been introduced, showing in flat ornament an arrangement of pointed arches, terminating in freely designed Early English foliage. The decoration of this wall is completed by a scroll, containing a text, round the large arch, while the remaining walls are treated in a simple manner, showing borders round the windows, and a running scroll at top of the wood lining. The whole decoration is in the pure Early Gothic style, and the prevailing colours are salmon-colour, brown, and red, and here and there a soft blue. The work is by George Dobie & Son, of George-street, Edinburgh. A boundary wall is being built round the church, and operations are going on for the introduction of a bell of 104 cwt. into the belfry, and a fourdial clock in the tower. The bell is to be by Warner, of London, and the clock by Ritchie, of Edinburgh.

General Engineering Construction.—The first of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, M.I.C.E., &c., Principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of February 14, in the reading-room of the Society of Engineers, Victoria-street, Westminster; Mr. Arthur Riggs, C.E., president, in the chair. The lecturer commenced by giving some general advice to young engineering students as to the sort of information they should seek, and to what they should devote their energies. Then, impressing upon them the great importance of a thorough knowledge of the obtaining and manipulation of materials, he touched upon timber and forestry, upon the values of fuels, upon the preparation of cast-iron, wrought-iron, and steel, upon the working of native stone, and upon the covering of roofs. The lecturer concluded by again impressing upon his audience the great importance of investigating these and similar matters in a practical manner for themselves.

Electrical Engineering.—The sixth of the series of lectures on "Electrical Engineering," by Mr. John C. Fell, was delivered on the evening of February 13, in the reading-room of the Society of Engineers, 6, Westminster Chambers; Mr. Arthur Riggs, president, in the chair. Mr. Fell resumed his subject by the consideration of systems of incandescent electric lighting, giving examples of the best known forms of lamps, such as the Swan, the Gasolene, and others. The laws of the development of heat and consequent light in filaments offering specific resistance to conduction were explained. The danger of disruption through excess of current was pointed out, and the necessity for an absence of oxygen in the atmosphere of the lamp surrounding the filament was explained. The modern improved methods adopted for the production of a vacuum in the lamps were shown by sketches, and some practical examples of safety junctions, lamps, &c., were exhibited.

The Westinghouse Safety Apparatus for Crossings.—The crossing of the Philadelphia and Reading and Lehigh Valley Railroads, two miles west of Bound Brook, New Jersey, has been fitted with interlocking signals and derailing switches upon the Westinghouse electro-hydro-pneumatic system, the movements of the switches and signals being effected by compressed air controlled by electricity from the signal cabin. This arrangement allows a train having the right of way to pass the crossing at full speed, during which passage it automatically locks open the derailing switches on the intersecting track, thereby preventing all possibility of collision. The apparatus has been erected by the Union Switch and Signal Company, of Pittsburgh, and came into operation on January 6. This is stated to be the first apparatus of the kind ever erected, and has excited much interest among American railway men.—*Iron.*

Newcastle.—The Newcastle Asylum visiting justices have appointed Arthur B. Plummer, architect, their architect for the intended extensive additions to Coxsledge Asylum. Mr. Plummer is also appointed architect for the intended Church Institute at St. Peter's Quay, for the Rev. J. Santer, B.A., the first portion of which is to be built this year.

The "Otto" Gas Engine.—Messrs. Crossley Bros., Limited, of Manchester, have recently added an important improvement to their gas-engine. This consists of a "Self-starting Apparatus," by means of which the engine can be put in motion by simply opening a valve. The apparatus consists of a small receiver into which the engine exhausts for a very short period of its stroke the burned gases which result from the ignition of the charge in the cylinder. These gases fill the receiver, and in the course of half a minute raise a pressure in it nearly corresponding to the pressure in the cylinder during the moment of ignition. These stored burned gases are admitted again to the cylinder at the moment of starting by a very simple piece of mechanism, and thus puts the engine in motion in much the same way as steam moves a steam-engine, thus saving the trouble of pulling the wheel round to get in the first charge.

The Keighley Timber and Saw-mills Company.—This company is starting what may be called an experiment on a large scale of some importance; an endeavour to prove practically that by the aid of machinery, division of labour, and close connexion with a railway system, joinery can be produced at a cost enabling the company to conduct a profitable business at the same scale of prices as those of the large Swedish and American manufacturers, whose work has been underselling English joinery so much. This is a spirited attempt to meet foreign competition, and if it succeeds, it may provide profitable employment both for English capital and English labour. Particulars as to the company will be found elsewhere.

London Commercial Deposit Building Society.—The twentieth annual meeting of this society is announced to take place at the Inns of Court Hotel, High Holborn, on Wednesday, March 5th. The directors have declared a dividend of 5½ per cent. Messrs. W. Hurren, chairman, E. T. Davy, C. H. F. Lewes, and W. F. Potter, the retiring directors, offer themselves for re-election. Messrs. Hurren and Potter have been connected with the society since its first formation in 1863.

TENDERS.

For new roads, sewers, &c., on the British Land Company's Estate, at Putney. Mr. Henry B. Michell, surveyor:—

J. Bloomfield, Tottenham.....	£1,680 0 0
F. W. Keeble, Regent's-park.....	1,639 0 0
J. Jackson, Leyton.....	1,383 0 0
C. Kiplingback, Camden Town.....	1,300 0 0
W. Harris, Camberwell.....	1,275 0 0
Nowell & Robson, Kensington.....	1,270 0 0
E. Wilson, Walthamstow.....	1,133 0 0
J. Pizzey, Hornsey.....	1,084 0 0
Pell & Sons, Bromley, Kent.....	1,049 0 0

* Accepted.

For building new schools for the Guardians of the Poor of the Edmonton Union. Mr. T. E. Knightley, architect. Quantities by Messrs. Batterbury & Huxley and Mr. Edward Clark:—

	Extra for Arley facing bricks.
Bentley.....	£64,915 .. £2,305
Tongue.....	63,551 .. 1,635
Hack.....	62,984 .. 1,633
Downs.....	61,332 .. 1,332
Hobbs.....	61,000 .. 1,634
Shurmer.....	58,365 .. 769
Hart.....	57,354 .. 1,489
Greenwood.....	55,259 .. 1,737
Nightingale.....	55,545 .. 879
Holliday.....	56,397 .. 1,635
Bray.....	55,263 .. 1,370
Wall (accepted).....	52,983 .. 769
Foster & Dicksee.....	52,620 .. 1,153
Howell.....	51,565 .. 1,700

For the erection of five stables and coachhouses, with roadway to the Devonport-road, at the rear of five shops, in the Uxbridge-road, Shepherd's-bush, for Mr. Miles Gashorp. Mr. Richard Tomlinson, architect. Quantities supplied by architect:—

G. Lyford (accepted)..... £925 0 0

For additions and repairs to residence at Orpington. Mr. G. St. Pierre Harris, architect:—

Wood.....	£1,493 0 0
Otway.....	1,339 0 0
Treadwell.....	1,335 0 0
W. & F. Crocker.....	1,269 0 0

For additions and repairs to house at Orpington. Mr. G. St. Pierre Harris, architect:—

Taylor & Son (accepted).....	£163 0 0
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[No competition.]

For additions to a house at Keston. Mr. G. St. Pierre Harris, architect:—

Wood.....	£269 0 0
Otway.....	943 0 0
Crosley.....	893 0 0

* Accepted, subject to modification.

For Fire Station, Sheds, &c., Hornsey, for the Hornsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor:—

Colls & Sons, Moorgate-street.....	£3,100 0 0
B. E. Nicholls, Lambeth.....	2,885 0 0
Gibbs & Imber, Highgate.....	3,899 0 0
J. W. Dixon, South-grove, Highgate.....	2,729 6 2
J. & J. Greenwood, Hermandsey.....	2,350 0 0
Staines & Son, Great Eastern-street.....	2,778 0 0
Mastlock Bros., Finsbury Park.....	2,977 0 0
W. Goodman, Holloway.....	2,888 0 0
John Tibbrell, Crouch End-hill, N.....	2,719 19 6
Wilkinson Bros., Finsbury Park.....	3,085 0 0
C. F. Kearley, Kensington.....	2,790 0 0
Dunmore, Crouch End, N.....	3,208 0 0
Pyle & Co., Herne Hill.....	2,835 0 0
Kerry & Son, High-street, Highgate.....	3,267 0 0
James Harper, 98, Amhurst-road, Hackney (accepted).....	2,578 0 0

For making and draining, with sewer and surface water drains complete, portions of Berkeley and Shackle roads, on the Crouch Hall estate, Crouch End, for the Imperial Property Investment Company, Limited. Mr. G. H. L. Stephenson, surveyor:—

	* 1st Estimate.	† 2nd Estimate
Bell.....	£1,417 ..	£1,250
Dunmore.....	1,314 ..	1,277
Walker.....	1,195 ..	1,119
Pizzey.....	1,191 ..	1,105
Wilson.....	1,150 ..	1,050
Adams (accepted).....	1,089 ..	977

* If roads made up with brick rubbish and stone ballast.
† If roads made up with dust-heap pickings and burnt ballast.

* If roads made up with brick rubbish and stone ballast.
* If roads made up with dust-heap pickings and burnt ballast.

For alterations at the Pines, Epsom. Mr. H. D. Church, architect:—

Akerman.....	£515 13 0
Thorn.....	383 15 6
Shurmer.....	373 0 0
Robbins.....	358 0 0
Golden.....	319 0 0

For additions and sanitary alterations to Sussex County Asylum. Mr. Henry Card, county surveyor:—

Lockyer, Brighton.....	£3,954 0 0
Cheesman, Brighton.....	3,490 0 0
Smith & Co., Worthing.....	3,330 0 0
Knights, Chichester.....	3,184 0 0
Box, Ardingly.....	3,089 0 0
Norman, Burgess-hill (accepted).....	2,995 0 0

For St. Paul's Vicarage, New Swindon. Mr. John Bevan, architect, Bristol. Quantities supplied:—

P. Wilkins & Sons, Bristol.....	£1,590 0 0
W. Church, Bristol.....	1,490 0 0
W. Cowlin & Son, Bristol.....	1,459 0 0
Stephens & Batson, Bristol.....	1,450 0 0
H. H. Pore, Bristol.....	1,415 0 0
T. Barrett, Swindon.....	1,390 0 0
C. J. King & Son, Bilton.....	1,382 0 0
E. & T. Hatherly, Bristol.....	1,350 0 0
E. C. Howell & Son, London and Bristol.....	1,336 0 0
W. Jones, Gloucester.....	1,320 0 0
J. Wheeler, Wantage.....	1,215 13 6
G. Wiltshire, Swindon (accepted).....	1,236 0 0

For the erection of new schools and vestries in connection with the Wesleyan Church, Blackheath. Messrs. Dunk & Geden, architects, Leadenhall-street:—

Owley.....	£3,442 0 0
Dobey.....	2,950 0 0
Lawrence & Sons.....	2,918 0 0
Rider & Son.....	2,819 0 0
Smith & Sons.....	2,735 0 0
Outwater.....	2,694 0 0
Morter.....	2,687 0 0
Staines & Son.....	2,672 0 0
Greenwood.....	2,669 0 0
Ferrard.....	2,627 0 0
Chafin.....	2,558 0 0
Grubb.....	2,470 0 0
Tongue.....	2,450 0 0
Kensard Bros. (accepted).....	2,283 0 0

For the erection of school and class-rooms for the Trustees of Romford Congregational Church. Mr. E. C. Allan, architect, Romford. Quantities supplied:—

J. Abrahams, Romford.....	£1,250 0 0
Staines & Son, Great Eastern-street.....	1,148 0 0
J. E. Dowling, Romford.....	1,080 0 0
A. Davey, Romford.....	1,030 0 0
G. Death, Romford.....	1,015 0 0
W. Wood, Chelmsford (accepted).....	1,010 0 0

[Architect's estimate, 1,011.]

* Amended estimate to include additional work, 1,160.

For the erection of a tobacco factory at the rear of No. 143, High-street, Whitechapel, for Mr. E. Tophis. Mr. John Hudson, architect, 89, Leaden-street:—

T. Norton & Son, Stratford.....	£1,432 0 0
T. Little, Whitechapel.....	1,397 0 0
A. Eaton, Whitechapel.....	1,386 0 0
G. P. Roberts, Cannonbury.....	1,369 0 0
W. Marriage, Croydon.....	1,240 0 0

For building an addition to the Shoeburyness Tavern, Shoeburyness, Essex. Mr. John Hudson, architect:—

G. Ventris.....	£280 0 0
J. Alp.....	274 5 0
J. & H. Cocks.....	248 0 0
S. Norden.....	227 0 0
Baker & Wiseman (accepted).....	223 0 0

For alterations and additions to Silverlands, Chertsey, for Mr. F. A. Hankey. Mr. George A. Dunnage, architect, 5, John-street, Adelphi. Quantities by Messrs. J. & A. E. Bull, 35, Craven-street:—

Knights & Sons, Chertsey (accepted)..... £9,143

For works at Harvest Home, Oakington. Mr. Frank Waters, architect, Cambridge. Quantities supplied:—

Christians, Histon.....	£435 0 0
Hammond, Longstanton.....	437 0 0

For alterations and additions to the Board Schools, Byres-road, for the Croydon School Board. Quantities by Mr. Robert Ridge, Surveyor to the Board:—

Legg.....	£6,800 0 0
Maiden & Harper.....	6,670 0 0
Ward.....	5,988 0 0
J. & C. Bowyer.....	5,861 0 0
Bullock.....	5,589 0 0
Taylor.....	5,720 0 0
Lee & Son.....	5,638 0 0
Coles.....	5,677 0 0
Hol.....	5,575 0 0
Smith & Bullock.....	5,423 0 0
Pearson.....	5,400 0 0
Sedgwick.....	5,229 0 0
Smith & Son.....	5,196 0 0
Marriage.....	4,950 0 0

For erecting the Langford-road schools, for the School Board for London. Mr. E. R. Robson, F.R.A., architect:—

Shillito.....	£14,519 0 0
Wood.....	13,910 0 0
Howell.....	13,063 0 0
J. Linson.....	12,795 0 0
Bangs.....	12,751 0 0
Turtle & Appleton.....	12,748 0 0
Lathey Bros.....	12,674 0 0
Smith & Son.....	12,570 0 0
Kirk & Randall.....	12,540 0 0
Reading.....	12,533 0 0
Oldrey.....	12,527 0 0
Brass.....	12,418 0 0
Jerrard.....	12,333 0 0
Stimpson.....	12,180 0 0
Holloway.....	12,119 0 0
Sturmer.....	12,092 0 0
Grover.....	12,088 0 0
Downs.....	11,855 0 0
C. Wall.....	11,820 0 0

For alterations to Mr. Gorrings's premises, Brewer-street, Pimlico. Mr. J. T. Walford, architect:—

W. Scrivener & Co. (no time).....	£1,698 0 0
Hall, Boddall, & Co. (1st April).....	1,294 0 0
C. Fish, Prestige, & Co. (two months).....	1,157 0 0
Wilkes Bros. (two months).....	1,776 0 0

For the erection of new schools at Spark Hill, Yardley. Mr. W. Hawley Lloyd, architect, 79, Colmore-row, Birmingham:—

	Schools.	Extra Class-room.
J. Moffatt.....	£21,616 0 0	256 0 0
T. Mills.....	1,808 14 0	70 0 0
W. Sapcote & Sons.....	1,449 0 0	63 0 0
T. Hughes.....	1,436 0 0	77 16 0
Whitehouse & Jones.....	1,469 0 0	60 16 0
J. Rice.....	1,456 8 11	64 16 10
Bray Bros.....	1,454 0 0	57 0 0
W. Trow & Sons.....	1,448 9 9	56 14 10
F. J. Briley.....	1,443 0 0	56 0 0
J. Smith & Sons.....	1,398 0 0	54 0 0
T. Smith (accepted).....	1,359 0 0	47 19 0

For works to roofs of mansion at Dromore, near Maidenhead, for Lady Louisa Fortescue. Mr. G. B. Mayo, architect:—

	Allowance for Old Materials.
W. Watson, Ascot.....	£347 13 0 .. £135
Burman & Sons, Enfield.....	755 0 0 .. 85
North & Son, Southwark.....	793 0 0 .. 109
J. Boulter, Slough.....	743 0 0 .. 65
W. Harbord, Brighton.....	717 7 0 .. 77
W. H. Simonds, Reading.....	729 0 0 .. 129
G. Almond, Burnham.....	634 7 6 .. 45
J. Deverill, Slough.....	645 0 0 .. 75
F. Taylor, Uxbridge.....	634 0 0 .. 76
W. Woodbridge, Maidenhead.....	615 0 0 .. 89
L. A. Williams, Beaconsfield.....	569 9 3 .. 69

* Accepted.

Accepted for sundry alterations and repairs for Messrs. Bowring and Small, 22, Baker-street. Mr. J. W. Morris, architect, Gracechurch Street-buildings:—

D. D. & A. Brown, Camberwell-green.....	£200 0 0
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[No competition.]

For retaining walls in buttress and arcade work, for intramural internments in vaults and catacombs, at Nottingham Church Cemetery. Mr. Fredk. Jackson, C.E., architect, Nottingham:—

Lynam & Kidd, Nottingham.....	£1,925 0 0
Bradley & Barker, Nottingham.....	1,825 0 0
Meats Bros., Nottingham.....	1,770 0 0
J. Hudson, Nottingham.....	1,471 0 0
T. Beck, Matlock.....	1,308 0 0
T. Smart, Nottingham.....	1,252 0 0
S. & J. Cargill, Nottingham.....	1,262 0 0
Foster & Barry (accepted).....	1,127 0 0

[Architect's estimate, 1,231. 10s.]

For additions, Cefnfeaf, Rhayader, Radnorshire. Mr. Stephen W. Williams, County Surveyor:—

D. B. Hamer, Rhayader.....	£497 14 0
J. Davies, Hereford.....	468 0 0
J. Williams, Knighton.....	457 7 0
Treasure & Son, Salep (accepted).....	443 0 0
T. P. Evans, Rhayader.....	469 0 0
W. Bowers & Co., Hereford.....	449 0 0
G. Dore, Rhayader.....	425 0 0
E. Davies, Newtown.....	376 0 0

For sewerage, levelling and laying foundations in Gladstone-road, and the sewerage of Granville-road, in the township of Urmston, for the Burton-upon-Trent Sanitary Authority. Quantities supplied by the engineer, Mr. John Price, Assoc. M. Inst. C.E.:—

Snap & Sons, Eccles.....	£265 4 8
J. Randall, Westo.....	802 6 0
J. Oakes, Kearsley.....	565 4 10
E. Bird, Chorlton.....	561 6 0
G. Unsworth, Moss Side.....	546 14 6
M. Naylor, Hulme.....	533 4 3
T. Wilas, Chorlton-on-Medlock.....	510 1 7
W. H. Worthington, Rusholme.....	474 6 3
W. Hammett, Ashton.....	443 18 2
R. Lomax, Eccles (accepted).....	438 14 0

[Engineer's estimate, £516.]

For proposed new building at the corner of St. Mary
Are and Great St. Helen's, for Mr. A. Keiday. Mr. T.
Chatsfield Clarke, architect:—

E. Conder	£9,035 0 0
J. & J. Greenwood	8,632 0 0
Colls & Sons	8,318 0 0
Holland & Hannam	8,212 0 0
M. Rodman	8,164 0 0
Hall, Beddall, & Co.	7,985 0 0
Asby Bros.	7,788 0 0
G. H. & A. Bywaters	7,768 0 0
Asby & Horner	7,664 0 0
B. E. Nightingale	7,473 0 0
B. Lawrence & Sons	7,418 0 0

For completing houses at Ewelme, and for the formation
of roads on building estate at Goring. Mr. J. S. Dodd,
architect. Builder:—

Holly & Butler, Nettlebed	£695 0 0
Selby, Oxford	683 0 0
Brasher, Wallingford	649 0 0
Partlo, Tilehurst	634 0 0
Woodroffe, Reading	645 0 0
Dover, Oxford	640 0 0
Newberry, Reading (too late) ..	620 0 0
Weller, Wallingford	695 0 0
Cox, Henley-on-Thames	664 0 0
Buckle & Wheeler, Abingdon ..	615 0 0

Accepted.

For constructing new roads on the Goring Building
Estate. Mr. J. S. Dodd, architect:—

F. Talbot, Caversham	£275 0 0
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For artisans' dwellings, Boundary-street, Shorelitch,
for Mr. James Hevers, Messrs. Thos. & Wm. Stone,
architects, Great Winchester-street-buildings, London
Wall:—

S. W. Hawkins	£3,740 0 0
J. Anley	3,727 0 0
J. H. Johnson	3,593 0 0
J. Howlett	3,360 0 0
F. G. Higgins	3,255 0 0
G. W. Beale	3,219 0 0
Jackson & Todd	3,184 0 0
Thomson & Son	3,120 0 0
W. Goodman	2,888 0 0
E. E. Young	2,868 0 0
B. T. Wood	2,855 0 0
Steel Bros.	2,697 0 0
C. Forrest, Victoria Park-squars *	2,488 0 0

* Accepted.

For the erection of additional stabling at Uxbridge-road,
Shepherd's-bush, for the London General Omnibus Com-
pany, Limited, under the superintendence of Mr. G. T.
Lanham. Quantities by Mr. A. J. Bolton:—

Williams, Son, & Wallington	£980 0 0
Lyford	807 0 0
Scharien & Williams	863 0 0
Scott	827 0 0
Priestly & Gurney	773 0 0
Higgs	750 0 0
Hack	748 0 0
Garrod	727 10 0
Howell & Son	721 0 0
Richens & Moun	729 0 0
Haynes	703 0 0
Parker	649 0 0
Aldridge & Jenrey	628 0 0

For proposed new Baptist Chapel and Schools in the
West-end-road, Putney, for the Building Committee. Mr.
John Johnson, architect, Queen Victoria-street. Quantities
supplied by Mr. William H. Pipe:—

Bishop	£3,760 0 0
J. W. Baker	5,657 0 0
Tarrant & Son	5,625 0 0
B. Conder	5,496 0 0
Higgs & Hill	5,494 0 0
Stimpson & Co.	5,480 0 0
W. Johnson	5,396 0 0
Nightingale	5,300 0 0
Kilby & Gayford	5,250 0 0
J. Smith & Co.	5,083 0 0
Allen & Son (accepted)	4,500 0 0
Hobson	4,462 0 0

For erecting and completing The Shakespeare, Waterlo-
street, for Messrs. Truman, Hanbury, & Buxton. Mr.
J. C. Reynolds, architect. Quantities not supplied:—

Goad	£229 0 0
Shurmer	827 0 0
D. D. & A. Brown	800 0 0
W. Smith	798 0 0
T. Smith	785 0 0
Parker (accepted)	695 0 0

For alterations and additions to business premises, High-
street, Bedford, for Mr. E. P. Rose. Messrs. Usher &
Anthony, architects and surveyors:—

Knights & Boston	£2,518 0 0
S. Foster	2,430 0 0
T. Spencer	2,398 0 0
Watson & Walker, Bedford *	2,382 0 0

* Accepted.

For the erection of a pair of cottages and machine and
engine houses, at Putney, Goldington, Bedford, for Mr.
Chas. Pope. Messrs. Usher & Anthony, architects and
Bedford, surveyors:—

G. Harrison, Bedford (accepted)	£298 0 0
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For the erection of a dwelling-house in De Pary's-avenue,
Bedford, for Mr. W. J. Robinson. Messrs. Usher &
Anthony, architects and surveyors, Bedford:—

S. Foster, Kempston (accepted)	£1,203 4 0
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Accepted for public swimming and other baths at
Forest-hill, for the Commissioners of Baths and Wash-
houses for the Parish of Levensham. Messrs. Wilson, Son,
& Aldwinckle, architects, 2, East India avenue, Leaden-
hall-street:—

D. D. & A. Brown, Camberwell	£7,177 0 0
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Accepted for new class rooms at St. Mary's school, Ley-
land, near Preston. Mr. D. Grant, architect, Preston:—

Brickwork, slaterwork, plaster work, slating and
fencing.

J. Simpson, Leyland.
A. Tomlinson, Leyland.
J. Hesketh, Leyland.

William Dryden, Preston.
Repaving school divisions.
J. Stones, Ulverston.

[Amount of contracts, £234]

Special Notice.—Lists of tenders frequently reach us
too late for insertion. They should be delivered at our
office, 46, Catherine-street, Strand, W.C., not later than
four p.m. on Thursdays.

TO CORRESPONDENTS.

W. M. K. next week. Several tenders have been submitted—
J. S. G. under consideration. T. L. P. we decline to publish
"tenders accepted" unless accompanied by a list of the
A. not required. S. Brothers (no space).
Correspondents should address the Editor, and not the Publisher,
except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied
by the name and address of the sender, not necessarily for publica-
tion.

We are compelled to decline pointing out books and giving
addresses.

NOTE.—The responsibility of signed articles, and papers read at
public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (lay and mere news items) which have
been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to
December, 1883) were given as a Supplement with the
number of January 12, and a COLOURED TITLE PAGE
was issued the following week, in substitution for that
published previously.

CLOTH CASES for binding the Numbers are now ready, price
2s. 6d. each; also

READING CASES (12th, with straps, to hold a Month's Numbers,
price 2s. each; also

THE FORTY-FIFTH VOLUME of "The Builder" (bound, price
Twelve Shillings, and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be
bound at a cost of 3s. 6d. each.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISE-
MENTS or ORDERS TO DISCONTINUE same,
must reach the Office before TEN o'clock on WEDNES-
DAY mornings.

PERSONS Advertising in "The Builder," may have *Repliers* addressed
to the Office, 46, Catherine-street, Covent-garden, W.C.
free of charge. Letters will be forwarded if addressed
envelopes are sent, together with sufficient stamps to
cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied gratis from the Office to residents
in any part of the United Kingdom, at the rate of 12s. per annum,
Postpaid. To countries within the Postal Union, 20s. per annum.
Remittance payable to DOUGLAS FOURDRIER, Publisher,
46, Catherine-street, W.C.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS,
TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under

Each additional line (about ten words)

Terms for Series of Trade Advertisements, also for Special Adver-
tisements on final page, Computations, Contracts, Sales by Auction,
&c. may be obtained on application to the Publisher.

Advertisements of 14 KTY words or under

Each additional line (about ten words)

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SATURDAY, MARCH 1 1884.

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Sir Joshua Reynolds.

It is a remarkable fact that, notwithstanding the amount that has been written on the life and works of Sir Joshua Reynolds, no serious attempt has yet been made to take the measure of him as an artist. This statement at first sight may seem untrue, but it is one capable of proof, and easy of explanation. The usual fate of the portrait-painter is, of course, that his works should be subordinated in interest to the people they represent; and with Reynolds this result is the more probable, because his portraits are of those men and women who live for us in the letters of a Horace Walpole and the pages of a Boswell. It is but natural, therefore, that the series of pictures which issued in such a number from his studio should be studied rather for the light they throw upon the copious and fascinating memoirs and biographies of the last century, than for the purely artistic interest attaching to them as the works of one of the greatest of the English school of painters. The biographers of Reynolds have always written under the overpowering influence of Boswell; they have striven to bring us in contact, not so much with the artist as with the man and his companions; they take us oftener to the clubs and the dining-rooms which he was wont to frequent, than to the studio in which he built up his fame; and even when, on rare occasions, we find ourselves there, it is on the painter's subjects that our attention is almost wholly concentrated, on their *amours*, their politics, their adventures, their feats of arms; and meanwhile the great craftsman behind his canvas plies his task, and we are seldom allowed to watch how he accomplishes it. The people he painted are too near us in point of time; some of us can remember their children; their grandchildren are still with us. Every one can tell stories about this and the other more or less well-known individual, and it is therefore not surprising that, in the face of so much human interest, merely artistic interest should be scarcely noticed. Our complaint against the German writers upon the arts of the

Renaissance is exactly the contrary. In presence of the pictures of a Masaccio, a Botticelli, a Raffaele, they seem to forget that there is such a thing as humanity. They overwhelm us with technical minutiae, with details of the drawing of fingers and toes, and to their minds the interest of a subject seems to be directly proportional to the intricacy of the investigations connected with it. Nevertheless it would be well if we could import into our studies of the arts of our own painters a little of this German element. Without desiring to annihilate or indeed greatly alter Leslie and Taylor's really interesting "Life of Reynolds," we cannot but wish that much of the political history which is dovetailed into it, and many of the anecdotes (amusing enough in themselves) which are interspersed throughout it, had been omitted, and that some slight discussion of the periods of development of the artist, as an artist, had been inserted instead. By all means show us the man, but let us behold the painter too.

Now there is but one way in which any just and complete view of a painter can be obtained, and that is by considering the formation and growth of his style. Whence did he derive the foundations of his skill? What influences were from time to time brought to bear upon him, and with what effect? What elements in his work were due to his own individual character? These, and many more of a like kind, are the questions which the biographer of an artist must set himself to answer. The writer on Holbein may leave the life of Anne Boleyn to a professed historian and content himself with her painted image and its excellences or faults. The writer on Reynolds should be similarly reticent. There is no lack of literature about the social history of the eighteenth century; but, as things are, the student who would concern himself with the artistic qualities of Hogarth, Reynolds, Gainsborough, and Romney must rely upon his own investigations. With regard to Reynolds, then, we desire to know, first of all, from what sources he derived the elements of his style, and what influences from without acted upon its development. We are told in reply that his master was Hudson, that he was brought at an early period in contact with the works of Gandy of Exeter (whose father was a pupil of Vanduyck), and that he spent two years in Italy in earnest study of the works of the great masters. Note-books, to which fortunately his biographers give us access, and sketch-books of his, exist, but no sufficient critical study of them has been made to enable us to declare what factors of his manner were derived from what sources. The works of Hudson and Gandy are not so well known that their names are sufficient to call up any definite style of work in the memory even

of a tolerably educated amateur. The sketch-books, again, are not easily accessible to everybody, and, no doubt, they would require a good deal of comment before they could be made of much service. In the case of those brought back by the young painter from Italy we should want to be informed what, in each case, was the original picture from which a sketch was taken, and what use, if any, the artist afterwards made of it. That Reynolds was wont, even in his latest years, to recur to the prints and pictures he had seen, and the sketches he had made in his boyhood, we can show by several conspicuous instances. Two or three times he borrowed ideas from Cats's "Book of Emblems," the play-book of his childhood; whilst the picture of Mrs. Sheridan as St. Cecilia, to mention no others, was founded upon a drawing made by him thirty years before in Italy. Taylor and Leslie inform us of these isolated facts, but neither they nor any of Reynolds's biographers have ever attempted a thorough investigation into these and kindred matters. It is, therefore, the more to be regretted that, in the most interesting collection of the artist's works now on view at the Grosvenor Gallery, no attempt has been made to bring together, also, a few pictures by Hudson and Gandy, that we might see for ourselves what manner of teaching the lad received, and what effect was produced upon him in early years by contact with another formed painter besides his master. It is even a greater pity that more drawings have not been brought together, and arranged and briefly catalogued in chronological order, so that we might be able to watch the growth of the young artist's skill in assimilating ideas and recording suggestions derived from the inspection of works of art of all periods. Reynolds's Venice notebook, printed in the "Life," shows that his eye, in the midst of that city of colour, was mainly interested in observing methods of handling and distributing light and shade. We also gather that he was wont to make brief records of the *chiaroscuro* of pictures by simply shading-in the dark spaces and the half-lights. A few specimens of these and the like studies would be most instructive, and from them we should gladly pass on through a series of more finished studies from old masters to his own first ideas for pictures, rapidly noted down. Such studies and sketches, no doubt, exist amongst the few drawings in the Grosvenor Gallery, but they are unnamed, undated, and uncatalogued, and therefore useless. Of this want of arrangement (of which we previously complained in our special notice of this exhibition) a single instance may be noticed. One of the four drawings in the frame No. 217 is a rough pen-and-ink sketch of a boy in a landscape,



leaning against some kind of table, with his hand resting upon a crouching owl. In another room, and invisible from anywhere in the neighbourhood of this drawing, is a small oil-colour sketch (No. 96) for the same subject, of peculiar brilliancy and richness; whilst, again, there hangs, in a third room, and invisible from anywhere near either of the preceding, the finished oil-painting,—one of the most charming of Sir Joshua's portraits of boys,—representing the young Earl of Dalkeith (No. 132). Had the three stages of the work been arranged together it is not too much to say that they would have formed one of the most interesting groups in the collection. A somewhat similar mistake has been made in hanging the two portraits (of 1769) of the Countess Spencer and her little girl in different rooms. It is clear that Sir Joshua or his sitter was not satisfied with the first attempt (No. 199), and it was accordingly laid aside after the mother's face had been almost finished, and the child's roughly sketched in. Accordingly a new start was made with a larger canvas; the child was placed on the other side of its mother, but the positions were otherwise retained as before. If this finished picture (No. 157) had been hung beside the unfinished one of the same date, we should have had a most valuable opportunity of comparing the different stages of the artist's work, and seeing for ourselves how he was able to spread over cold purple undertones that mellow harmony of tints which is the peculiar characteristic of all his most pleasing works.

Before the exhibition was opened we were given to understand that the arrangement of the pictures was to be, as far as possible, chronological. No attempt, however, in that direction has been made, and, indeed, pictures of the same period (the young Duke of Gloucester and "La Collina," for instance), that seem almost to have been painted as pendants, are often gratuitously dispersed about in different rooms. Artistically, no doubt, the hanging is well done, but the artistic effect is purchased by the sacrifice of much of the possible utility of the exhibition. The public have still to learn, what it is hopeless to expect artists ever to understand, that the only order in which a painter's works can be studied with profit is the chronological. It is only so that they hang together as a whole, and mutually explain each other. Now and again all artists make experiments in new directions, and with Reynolds such experiments formed a part of his normal practice; but, unless the chronological arrangement is adopted, the eye cannot distinguish between what is merely exceptional and what is the result of direct development, between what is ephemeral and what is absorbed into the artist's regular practice. Just as in the study of schools of art, archaic work and that of epochs of decline derive almost all their interest from the light they throw upon the art of the central period of a school, so, in the study of each individual artist, the productions of his youth, in themselves often of little beauty, when considered in relation to the growth of the man as an artist, flash into importance, and become bright with interest. Some artists, indeed, such as John Van Eyck, show, in those of their works that have come down to us, comparatively little change. The Ince-Blundell "Madonna," now exhibited amongst the "Old Masters," tells its story of honest hard work and unflinching industry plainly enough, alone as it stands. But most painters, if their lives extend to the normal limits, pass through many well-defined stages of development, during some of which it is not too much to say they are as different from themselves at other times as from other artists. Such a man was Reynolds, perhaps of all painters the most varying. A brief inspection of any 200 of his works arranged at random is the most puzzling thing imaginable. It seems difficult to believe that we have before us the works of one man and not of several, all of different natures and gifts. But arrange his works in their historical order, and all this confusion ceases at once. The different stages of style through which he passed group themselves naturally together, and lead us from one to another. To indicate in a few words what

is the nature of these changes and developments is, of course, impossible; but certain sign-posts of the way may be pointed out.

Sir Joshua's pictures naturally divide themselves, according to their form and subject, into groups, whole-length portraits, three-quarter lengths, half-lengths, busts, pictures of a mother and her child, and pictures of children. For each of these classes of work the artist developed a different style simultaneously, no two pictures, for example, presenting a greater contrast than the "Schoolboy with a Portfolio" (No. 192), and the full-length "Lady J. Lindsay playing a Harp" (No. 82), both of 1777. Not only, however, are there these simultaneous differences of style imposed upon the painter, as he conceived, by the form of his pictures, but each style has its own periods of growth, and each, to some extent, acts on the others, and is influenced by them. In the year 1780, for instance, Reynolds shows in a great many of his pictures a tendency to indulge in a strong, almost Rembrandtesque chiaroscuro. He likewise uses, with continually increasing skill and delight, a very rich brown colour; and some of his pictures of this period, notably the "Tragic Muse," of 1784, are little more than monochromes in this rich golden brown. All the time, however, his standing full-length portraits of women retain very much the same qualities they possessed before. These standing full-lengths, indeed, are always markedly different from his other pictures. Not only is there a difference of tone of colour and scale of illumination in them, but the difference extends to the way the painter looks at his subject as a human being. The half-length ladies are always beautifully human, thoroughly characteristic in costume, expression, posture, and everything else. But in the full-lengths Reynolds seems to paint people from another sphere of existence altogether; the ladies are all nymphs, dressed in some sort of ideal costume, and engaged in ideal employments, such as "Draping the Altar of Hymen with Flowers," and the like. In his fourth discourse as President of the Royal Academy, Reynolds said: "The works, whether of poets, painters, moralists, or historians, which are built upon *general nature*, live for ever; while those which depend for their existence on particular customs and habits, a partial view of nature, or the fluctuations of fashion, can only be coeval with that which first raised them from obscurity." It is in his full-lengths that Sir Joshua allowed himself to fall under the dominion of this theory. He clothed his ladies in "generalised" drapery, "drapery, and nothing more"; he gave them "generalised" expressions of countenance, and occupied them in employments which did not "depend on particular customs and habits." The consequence, of course, is that this set of pictures, instead of being the most immortal, consists of those from which interest has, in great measure, passed, because they were based, not upon nature and fact, but upon the taste of a day. Notwithstanding, however, the wide interval by which this class is separated from the other classes of Reynolds's works (and this is the point at which we have been aiming), the Rembrandtesque tendency, which manifests itself in the years 1780 to 1784, is likewise in a measure reflected in some of the full-length ladies' portraits of that time,—notably, for instance, in the picture of Mrs. Peter Beckford (No. 31), who is represented as standing in a temple in the act of offering a sacrifice, barred shadows of unusual depth falling in a striking fashion across her figure and the architecture behind. In almost all the full-lengths of other periods of the painter's career, the figure stands in full light and wears drapery of a glossy character, such as Sir Peter Lely loved to employ. The contrast is therefore the more remarkable in this case; but when the picture is considered in relation to its contemporaries its exceptional character is easily explained.

Without wishing in the least to depreciate Sir Joshua's portraits of men, some of which, such as the Johnson in the National Gallery, stand on a level with any by Titian, Dürer, or Holbein, we shall probably carry the assent of the reader with us when we say that his most

attractive paintings are his half-length portraits of ladies and his pictures of children. To the former type belongs one of his earliest finished works,—the "Mrs. Field" of 1748. In that we find the young aspirant to fame laboriously striving to catch the habitual expression of a benevolent countenance, and by honest and long-continued effort succeeding in fixing on his canvas the traces of a constant smile. Seven years later his picture of Lady Caroline Keppel marks a considerable increase of power. The posture of the sitter, who leans forward upon her folded arms, is one that could be long sustained and, therefore, carefully reproduced; but once again, though with greater skill in the modelling, the face is rendered with laborious detail, wrought out from point to point: and again it is a face about which there plays the pleasant reminiscence of a smile. Four years afterwards the portrait of her sister, Elizabeth, manifests the greater swiftness of handling which the painter had acquired, and shows, moreover, that he was now endeavouring, not alone to reproduce the best expression of his subject, but to surround her with raiment and other accessories that should in themselves form a delightful harmony of colour for the pleasure of all eyes. The "Blue Lady" of 1761 marks the final triumph of the artist in this respect, and proves that in the treatment of drapery and the harmonising of tints he had made rapid progress. The fascinating picture of Mrs. Abington, in the character of "Miss Prue," is known to everybody. In it Sir Joshua shows himself at length possessed of that remarkable power of seizing momentary attitudes and passing gestures, and of catching the most evanescent expressions of a countenance, and not only those that were habitual to it. Moreover in this picture those mellow tones and pretty combinations of various colours and textures appear for the first time in full development. It is not, however, till eleven years later, in the portrait of Mrs. Morris, of 1775, that we arrive at the final type of half-figure portrait of a lady. Here, at last, to richness of colouring, splendour of costume, variety of texture, and perfection in the rendering of a likeness, there is added a certain excellence of chiaroscuro, a certain glimmer of soft light about face and figure that ennobles the whole work and raises it to a higher level than all that had gone before. The Countess Spencer (of 1782) with her large hat, and the charming Miss Fanny Kemble of the following year, are but stages in the further development of this type along the same lines; and when at last we reach the Lady Thomond of 1784, the Countess Spencer of the same year, with her sweet little face looking out from the midst of its frills and its furs, the Lady de Clifford of 1786, and the Lady Elizabeth Foster of 1787, we find embodied in all of them the accumulated results of years of careful study of the human face, and shed over all of them an atmosphere of feminine tenderness which is not their own, but proceeds from the painter's educated delight in whatever of gentle and womanly he had in all his days beheld.

It would likewise be easy to trace Sir Joshua's development in the representation of children, from the altogether Mediaeval babe in the picture of Lady Cathcart of 1755, and the doll-like creature which hangs from the skirts of Lady Pollington in 1762, to the beautiful little woman with her skirts tucked up, who, in 1767, carries her rough-haired dog so carefully across the brook; and thenceforward through all manner of children, grave and gay, fascinating us now with simple childish ways, and again with a naive mimicry of the courtly manners of their elders. Sir Joshua's paintings of children have, however, formed the subject of a special study, now accessible to all, and may, therefore, be passed over here. With them, as with all classes of the artist's works, the same general lines of development may be observed, crossed now and again by this and the other side influence, according to the particular master or school whose works at the time formed the principal subject of Reynolds's study. At two different and widely-separated epochs we may see him fall under the shadow of Rembrandt. More than once he comes

within the sphere of Rubens, and again and again he measures his strength with Vandeyck. The Italians whom he studied in Italy,—and amongst them especially Correggio and Tintoret,—left their traces in the growth of his style, and amongst his latest works are numbered those ideal pictures in which he strove to emulate the colouring of Titian. It is high time that amongst the multitude of people who in these days pride themselves upon the intelligent interest they take in art, some one should arise to devote to the greatest of English masters of the last century a fraction of the attention which is still almost wholly concentrated upon the sculptures of Greece and the paintings of Italy.

THE ROYAL COMMISSION ON THE HOUSING OF THE POOR.

AFTER the amount of discussion and contradiction which has taken place in regard to the question of "the dwellings of the poor," the appointment of a Royal Commission to take evidence and report upon the whole subject is what might have been for some time past expected. Whether the result to be obtained from the labours of a Commission can be commensurate with or counterbalance some of the disadvantages of such a practical suspending of action for probably two or three years, is a question that will occur to many who are among the most desirous to find a way to deal with the evils of insanitary and over-crowded dwellings. That the members of the Commission will be honestly desirous to bring the matter to some practical issue, as early at least as is consistent with the time-honoured methods and habits of Royal Commissions, we have no doubt; but the principle of selection seems an odd one, or, at least, what appears to have been the principle. Sir Charles Dilke will make an admirable chairman; Sir Richard Cross has identified himself with the subject, as also has the late conductor of this journal, who has not only the experience of previous personal examination into the condition of the London poor, years before the present "bitter cry" was raised, but is also the only member of the Commission who is likely to be able to deal effectively with the practical questions of building construction and economy which, more or less, bear upon the subject. But the emphasis which has apparently been laid upon the selection of members to "represent" the Anglican, the Roman, and the Dissenting priesthood or presbytery, suggests the idea that a good deal of useless and unpractical procedure,—a "foolish and unlearned question,"—may creep upon and waste the time of the Commission, unless a strong hand or two undertake the task of repression. What have the various "denominations" to do, in that capacity, with obtaining practical evidence on practical subjects? What has such an unbalanced *doctrine* as Mr. Jesse Collings to do on a Board where the object is to deal with facts, not to air fancies? The list of names is really a curiously heterogeneous mixture, and forms a council which, on Bacon's shrewd suggestion, should sit at a long table, and not at a round one,* provided the right men get at one end of the table.

Granting that fortunate concurrence, what is to be gained from the appointment of the Commission which we have not within our reach already? Those who best understand the subject are nearly unanimous in the opinion that little or no new legislation is needed; that what is wanted in that respect is mainly the more efficient administration of existing legislation; and how to ensure that we know well enough, and what are the causes which stand in the way of it now. As to the condition of a large portion of the poorest classes, how they live and in what kind of dwellings, we have only too abundant testimony; and as to the question whether it is best to build lofty dwellings in towns, or to endeavour to spread

out dwellings into the country and take their tenants to and from their work by cheap trains, there is already sufficient evidence on the subject to have led most clear-headed people to decide against the locomotion system, as one which has been tried and on the whole has obviously not answered. As far as the problem in London is concerned, we do not believe the Commission will extract anything which is not known or of which the statistics are not perfectly available now. The extension of the inquiry to country districts may bring us some new information, and especially may throw some new light on the relation between the condition of the country labourer and the town labourer, in regard to cause and effect. But this is going beyond the ground for which the cry for a Commission was first made, and will break up and complicate the inquiry very much. Still, this is one part of the subject on which new information may be forthcoming, or in reference to which the connexion between one part of the subject and another may be focussed anew: and this latter advantage, of presenting a mass of known facts in a connected and comprehensive manner, may attach to the whole report of the Commission. But we have reason to know that those who are most actively engaged in work among the London poor, and are most earnest for whatever reform is possible, are by no means sanguine about the result. The appointment of the Commission will, they think, be a kind of excuse for doing nothing with many who wish to pose as philanthropists, but are glad to be relieved of the burden of actually fighting the dragon, and to have the excellent and ready excuse for inaction which will be furnished by the profession of waiting till the Commission has reported. But beyond this lies the more important and serious cause of distrust, in the fact that, as some know, but many obviously do not know, the real and essential causes of the state of things which we are trying to remedy lie, in fact, quite below the superficially apparent causes, and that the investigation of them is in reality outside the sphere of action specially marked out for the Commission.

How little some philanthropists in high places, who are prominent in the present movement, are able to grasp the real nature of the problem, was especially shown in Lord Salisbury's speech inaugurating the debate on the subject in the House of Lords at the latter end of last week. With, apparently, very serious purpose, Lord Salisbury is more superficial and unphilosophical in his way of looking at the subject than we should have thought possible on the part of one who claims to be a leading statesman. He is like a man who is annoyed at finding a flower-bed overgrown with weeds, and proposes to clear it by cutting off the heads of all the weeds, leaving the roots in the ground. We have no doubt Lord Salisbury would be willing enough to have the roots up too; but, not seeing the way to that all at once, he wants a Royal Commission to cut the tops off. In other words, he and those who move with him see a number of people living in miserable, unsanitary, and over-crowded dwellings, and they say: "This will never do: let us build better dwellings for these people, and let us get all the evidence that will enable us to know best how to do it." But there was positively not a sentence in Lord Salisbury's speech which indicated any query in his mind as to why we should set about building dwellings for these people; where the line should be drawn if we are once to begin to house people by State enactment; or (which is still more remarkable) how matters came into their present condition. Here are a mass of people for whom there is no room, who are unable to pay a remunerative rent for decent dwellings, who, many of them, do not care for decent dwellings. Surely the first, or at least the most important, question to be asked in such a case, is that embodied in the phrase in the Catechism, "How came you into this state of sin and misery?" And the catechism formula supplies the answer, "By ordinary generation." Given some generations of thriftless habits, little or no education, and consequently no moral and mental

stability, reckless and improvident early marriages, and equally reckless crowding into the capital as an imaginary Eldorado where work and wages are supposed to be had for the asking; given a considerable proportion of the community going on increasing and multiplying under these conditions, and the result is as inevitable as in a rule of arithmetic. The generation which has been brought or has migrated into a space where there is no room for its numbers, and where most of them are "not wanted," is, of course, fain to crowd up as it can, to exist in whatever space may remain unoccupied by those who can make good, practically, their claims on society. The spectacle is a deplorable, a heart-rending one; but if on that account we are to set about providing homes for this unhappy good-for-little crowd on easier terms than their neighbours enjoy, by whatever figment of philanthropic philosophy, what is that but, as the Bishop of London had the courage to say in the debate, "making the honest and industrious pay for those who are not so?" Put in whatever light we please, that is what it comes to; either the owners of property, or the general taxpayers, must pay for it. The answer may be and has been made,—and it is in that way that Lord Salisbury endeavoured to render his position apparently logical,—that by putting people into better homes you give them the chance of becoming better; but if there be, as we have always upheld, much to be said for the influence of the habitation on the man, it must not be forgotten that there is the equally unquestionable influence of the man on the habitation to be taken into account. And, as the Earl of Wemyss said, in delivering what Earl Granville would call his "cross-bench mind," "if they began on this system, where were they to stop? If they built houses would they furnish them? Would they put fire on the grate and food in the cupboard?"

"Speaking not his own opinion, but that of those philanthropic workers whose whole heart and soul were in this matter, and who had done so much in London to mitigate the evil, he could say that they strongly deprecated the appointment of this Commission. It would cause delay, discouragement, and demoralisation. It would cause delay, because no one would invest in this kind of property until he saw what the Commission recommended. It would cause discouragement, because people could not know what might happen at the end of the two years,—they could not know that their efforts might not be in vain. It would cause demoralisation, because it would teach large classes that they had not to look to their own exertions, and that the State must come forward and raise them out of the slough of despond."

And this feeling, we have reason to know, as we have already observed, is shared by some of those who have most practical right to know and to speak upon the subject.

The real remedy, as we suggested when Lord Salisbury's article on the subject first gave rise to its general and almost enthusiastic discussion, can only be found in the gradual influence of the better education of the lower orders which is being provided for,—we might say beneficently enforced,—by the modern legislation, the happy effects of which are only now just beginning to make themselves felt. Only a day or two since we were hearing from an eminent member of Parliament, who is prominent in all movements for educational reform, the story of the gradual physical and moral purification in a Board school in one of the worst districts of London, where not only the ignorance and brutality, but the positive filth of the unhappy children who first attended it proved such a trial to the teachers that they doubted if they could continue the work; and in a few months the same children would be sent to school clean and decent, not so much from the effect of any would-be compulsory regulations, as from the silent influence of the first elements of education and the first contact with persons of orderly and civilised habits. That is, in little, a picture of what we may hope the spread of education under our present enactments is slowly but surely effecting; and it is only to such influence that we can look for the real and essential remedy for the evils we are now deploring, and for which so many people seem vainly hoping to find some immediate and concrete remedy.

* "A long table and a square table, or seats about the walls, seem things of form, but are things of substance; for at a long table a few at the upper end, in effect, sway all the business."—*Essay Of Counsel*.

All that the Royal Commission can really do is this: they can bring together in a somewhat more comprehensive and accessible form the information which already exists as to the present working (or non-working) of sanitary legislation; they can suggest where existing legislation on that part of the subject requires to be supplemented, which will not, however, we believe, amount to much; and they may be able to elicit some fresh information as to the best method of planning and constructing the cheapest order of dwellings, so as to be at once healthful, decent, and remunerative; and we hope that this latter part of the subject will receive a large share of attention, and that practical witnesses, really competent to speak upon it, will be examined. At the same time, it is of no use to expect that success can attend the improvement of cheap tenements, unless the tenants can be got to meet the improvement half-way. A large class of persons exist at present for whom no decent lodgings can be built cheap enough, on ordinary economic principles. It may, perhaps, be found necessary to make some special provision *ad interim* for these, on the ground of public good in the way of physical and moral sanitation; but the expedient is at best a very doubtful kindness, and, even if adopted temporarily, is one which cannot be placed under too rigorous restraint and curtailment.

FIFTY-EIGHTH EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THE exhibition this year does not contain any great or important work which rivets attention, yet it must be admitted that the average standard of excellence, whether as regards capacity, style, or treatment, is maintained.

There is, as usual, a small contingent from English and Continental sources, and the most remarkable of these are portrait subjects. Amongst these the portrait of J. C. Hook, by Millais, which will be so well remembered at the Royal Academy, holds the pre-eminence. It seems to have been wrought out *con amore* with thorough conscientiousness in every detail; but the same cannot be said of Mr. Millais's other contribution, "The Convalescent," for in it the drapery is slurred over in a manner which suggests the contents of the paint-pot rather than the graduated contents of the palette. There is certainly, however, a call upon the sympathy of the spectator, and there is much beauty of colour in the hastily-touched-in bunch of sweet peas.

Herkomer's portrait of Archibald Forbes, war correspondent, is characteristic of the man; and his portrait of Ruskin is a remarkable example of a life-sized head in that medium; and in the likeness of Mr. Claud H. Hamilton we have an adequate example of the work of Mr. Frank Holl. Pettie's "James II. and Duke of Monmouth," "Young Laird," and "Westminster Scholar," can none of them be reckoned amongst the best works of the artist; and James Archer's "Peter the Hermit preaching the First Crusade" does not come up to the mark of many of his less ambitious efforts. "The Adders' Pool" of J. W. Oakes is replete with poetic feeling. As regards the colour and drawing of Alma Tadema's study of the nude in "The Tepidarium" there can be no doubt, but he might have found a more refined model; and as to his "Torch-dance" we confess that we see little to admire in it. Thomas Faed's "Lowland Lassie" is a pleasing example of his manner of delineating rustic beauty, albeit of rather too refined a type. The cottagers of Joseph Israels are of a different sort, and so are his schemes of colour and mode of working. There is a deep pathos in his "Anxious Family," which appeals to the spectator, and the subdued harmony and breadth of treatment form a marked contrast to the more bright tints and precisely defined drawing of Mr. Faed. The "Nuns" of W. Q. Orchardson, in their stainless white robes and sweet purity of expression, are more of heaven than of earth.

Sir Noel Paton is as dainty and fanciful as ever in his rendering of subjects from the

"Midsummer Night's Dream." He shows us Oberon seated upon a shelving rock attended by the elfish Puck as they listen to,—

"A mermaid, on a dolphin's back,
Uttering such dulcet and harmonious breath,
That the rude sea grew civil at her song."

There are the usual grace of form and smooth execution which characterise the work of this artist.

"The Antiquary and Lovel" is one of the happiest efforts of the President. There is an old-fashioned taste about it in perfect keeping with the subject, and the details are wrought out with skill and discrimination. D. W. Mackay's landscapes with figures are conscientiously worked out in every detail. The truly natural and pure open daylight effect in "Spring Time" is finely expressed, and each part retains its proper value, as witness the suggestion of distance in the vaguely-indicated mountains. W. MacTaggart's mode of working shows a marked contrast to this; it is clever and forcible, but intrinsically *ad captandum*. The light and colour in a "Message from the Sea" are undoubtedly fine, and similar qualities appear in his "May Morning," but the handling of the drapery, especially in the latter, is slovenly, and the bank of primroses possesses none of the freshness of nature. In a picture-gallery work of this kind may be effective, but in an ordinary room it appears coarse and glaring.

D. Murray's "Haymaking in the Scottish Fens" is a powerful rendering of the weird glare of thunder-clouds, lighted up by the setting sun over a wide expanse of landscape, but it strikes us that too much emphasis is given to the mass of cumuli, as they at once attract attention and detract from the more subtle elements composing the rest of the picture. Robert Gibb reverts to the rendering of battle-scenes, in which he has shown more individuality than in other subjects. We believe that the artist has not had the opportunity of being in the thick of battle, and has therefore to fall back upon his imagination. In the picture now before us he is less concerned in depicting a battle than in telling an incident of the fight. Two young officers of a Highland regiment who have been "Schoolmates" are in the front of the fight; one falls wounded into the arms of the other, who, sword in hand, is ready to defend him at all hazards, whilst in the rear the corps is being thinned down by the bullets of the enemy amidst the smoke and dust which are concomitants of such scenes. The firm resolve of the hero is ably expressed, but the effect of reality is lacking. This may in some degree be owing to the too elaborate working out in the details of uniform and accoutrements, which, in the case of the two principal figures, appear as if they had been donned for the first time. Robert Herdman presents us to a one-armed veteran whose battles are over, and who, under the guidance of his grand-daughter, visits a church in which is deposited "the old flag," which he regards with reverence. The contrast between the expression of the old man and the wonder of the girl as to what affects him are well brought out. There are refinement and grace in Clark Stanton's "Cinderella," and the colour is rich and harmonious. She is represented in the act of kindling the fire, and startled by the entrance of the fairy godmother.

There is depth of feeling in R. Macgregor's "Blind Pedlar," but, in his smaller productions especially, he has adopted a foreign manner which, whatever may be its merits, cannot be commended on the score of originality; it seems at present, however, to have taken with a section of the public. Similar in subject, but treated in a more national spirit, is Thomas Graham's "Eyes to the Blind," where a young girl is represented as informing a sightless old man of some stirring incident out at sea. W. B. Hole gives us another of his fishing subjects, in which he made an essay last year, and which we prefer to his rendering of Jacobite incidents.—"The Fill of the Two Boats," laden to the gunwale with herring, and nearing a cliff-bound coast, while the early dawn casts a clear light over a gently-rippling sea. George Aikman renders "A Flood of

Light at Sundown," seen through a scattered clump of trees, with poetical effect. George Hay is well represented by several of those subjects where ancient furniture and costume combine picturesquely.

We have only space left to observe that there are effective and attractive landscapes by George Smart, Alexander Fraser, and others; that Calder Marshall's bronze group of "Sabrina thrown into the Severn" forms a prominent object in the centre of the galleries; and that the full-sized model for the bronze statue of Robert Tannahill, to be erected at Paisley by D. W. Stevenson, is considerably above the average of such productions.

NOTES.

SIR F. BRAMWELL hit on a very effective manner of introducing his subject when lecturing on Thames Communications at the Royal Institution on Friday in last week, by commencing with a description of two Oriental towns, one containing a population of 890,000 people, and the other one of 655,000, divided by a narrow river, which they were always wanting to get over, but for the passage of which they took no more direct means than going round by a bridge some distance above the locality of the "towns." Then it came out that the Oriental towns were no further east than the two east Londons, on the north and south banks of the river, and that the description was of the nature of an allegory. Sir F. Bramwell is, as every one knows, in favour of direct communication below London Bridge. In pointing out that modern engineers could certainly overcome the difficulty of making a high-level bridge which would give clear passage for all the shipping that comes up to London Bridge, the lecturer, if he is correctly reported, forgot to inform his audience of the enormous drawback to the usefulness of such a bridge arising from the heavy ascents that would be necessary to reach it; while in recommending his favourite scheme of a tunnel he seems equally to have forgotten to mention the still somewhat formidable difficulty of descent, or of ascent on the other side: *revocare gradum,—hoc opus, hic labor est*; to get up the further gradient, that will be the tug. The steam-ferry, which "soon came to grief," was alluded to, but we are surely not expected to deduce from that the conclusion that all steam-ferries must share the same fate. We have little doubt that if a permanent communication be made it will take the form of a tunnel; but we again urge that well-found ferries, with large boats, should be fairly tried, before expending so much money on schemes every one of which has its practical disadvantage.

FROM a sprightly article contributed by M. Marcel Daly to the pages of *La Semaine des Constructeurs*, we learn the main results of the double architectural Congress at Nice, to which we have before referred. On the question of an obligatory diploma for all practising architects, which was opened by M. Chevallier, of Nice, the Congress appears to have come to an unexpectedly unanimous opinion on a very vexed question; namely, that such a diploma should be obligatory in regard to practical and scientific knowledge, leaving artistic capabilities on one side, to be decided by public and critical opinion; a very sensible decision. On the subject of the raising of the level of technical instruction for the *personnel du bâtiment*, the appointment was recommended of syndicates of architects, engineers, and contractors, to fully consider the subject. On the question of professional charges no conclusion was arrived at. On that of the responsibility of architects M. César Daly drew a broad distinction between architect and contractor, the one being the thought that directs, the other the hand that executes, and urged that no one ought to attribute to the former the responsibilities that belong properly to the latter; and the discussion terminated in a resolution to the effect that a permanent commission ought to be established in Paris to take charge of the interests of the profession generally, and to assist in the solution of the various difficulties

affecting the interests of the profession en masse.

THE International Congress, which followed upon the local one in which the preceding conclusions were arrived at, was remarkable. M. M. Daly admits, for the number of interesting and well-conducted excursions and visits in which the members took part. More serious matters were not, however, forgotten. M. Cordier, the sculptor, read a paper on *sculpture polychrome*, arguing that form had been the primary element of sculpture, and colour only a subsequent and less essential addition. M. César Daly was of opinion, on the contrary, that form, being a more abstract and intellectual element in design than colour, had detached itself as a separate object of study in the later and more intellectual development of sculpture,—a conclusion in which we are disposed to agree. At the last meeting of the Congress Dr. Brown-Séguard read a paper, which appears to have excited great interest, on the health of towns, especially on the necessity of a more abundant supply of pure air being introduced, by mechanical means, if necessary, into all dwellings, concluding with an appeal for “de l'air pur, de l'air abondant, de l'air et toujours de l'air!” amid the applause of his audience. The Congress, it may be observed, was one not solely of architects, but of architects and engineers bent on mutual improvement; and this idea of asking representatives of the two professions to co-operate in such a congress has been, the correspondent of *La Semaine* remarks, eminently successful. It is an experiment which might well be tried in this country, where the demarcation between the two professions is far more marked than it ought to be.

THE telegraphic report from Paris of the results of the meeting of the committee formed to defend the interests of the French shareholders in the Suez Canal must not, we take it, be understood to signify the deposition of M. de Lesseps from his post, but only the election of M. Magois as president of the committee. But, at all events, the owners of something like 1,000 votes appear to have been unanimous in their condemnation of the very modest concessions proposed by M. de Lesseps to the British shipowners. Bearing in mind the inadequate representation of British shares in the Canal which that agreement would have perpetuated, this hostile movement may be regarded with satisfaction. A thousand votes are nearly half the largest number that have ever been given at a meeting of the Canal proprietors. In 1872, 1,459 votes were given for, and 704 against, M. de Lesseps, whose authority, from that date to the present, has been unquestioned. The present schism is likely to produce a dead lock in the management of the Canal, which will render it necessary for this country to make use of the voting power.

THE Roman correspondent of the *Times* mentions the discovery, at Il Sassone, in the Alban Hills, of extensive remains of a Roman villa, from which have been dug eighteen pieces of sculpture, including a copy of the Laocoön, rather smaller than the original. The other sculptures include a Marsyas, an athlete, a faun, and various vases and bas-reliefs, &c.

THE debate on the second reading of the Metropolitan Board of Works (Further Powers) Bill on Wednesday afternoon ended with the acceptance of the second reading, with an intimation from Sir J. McGarel Hogg that it would be discussed, if possible, in a Committee of the whole House, and in a Select Committee. The Bill, if it become law, will enable the Board of Works to expend money from the rates in opposing or supporting Bills relating to water-supply, and in other ways to assist those who may have the will and the reason to oppose overcharges, instead of leaving them, like the heroic Mr. Dobbs, to fight single-handed. Some of the elements in the debate were amusing enough. Sir W. Harcourt, in a satirical speech, congratulated the

Board of Works and the Corporation of London on the eagerness that each had showed to bring forward a Water Bill since the idea of a general municipal government had been brought forward; but why had not the two bodies worked in co-operation? He feared they were bidding for popularity, “which was in itself an evil ambition.” By some speakers the new powers to be given to the Board of Works were supported because their increased powers would go to prove that no alteration in the government of London was wanted; by others, because the conferring on them such powers was a step in the direction of a great administrative reform. The speech of Mr. Coope in favour of the water companies was the best part of the play. It appeared that the water companies cannot reduce their charges, in consequence of the expense of defending themselves from the attacks made upon them for the bad quality of their water; true, Mr. Coope did not quite put it in that way, or at least he did not seem aware that he was practically doing so. The companies were giving us a most liberal supply of water, of which no one could complain. “Too liberal,” the consumers may say; “they supply us with solid food, as well as with drink.”

THE exhibition in Messrs. Arthur Tooth & Son's Galleries, open to private view to-day, includes some interesting works. Among them there is special originality in a painting entitled “Prayer,” by L. Nono, where a figure is kneeling in the middle of a road in front of some large shrine, the architectural details of which are painted with much force and realism. M. Julien Dupré's two works are remarkable for a broad free style of painting, indicating texture by variation of light and tone, and not by working-up of detail. This is specially to be noticed in the large painting “Minding the Flock,” where the painting of the sheep is quite a study of artistic handling, and contrasts remarkably with the style and manner of some flocks that appear at regular intervals on the line at the Royal Academy. Benjamin Constant's brilliant though rather superficial work is illustrated in “The Carpet Seller,” and one or two smaller paintings. Mr. Brett's “Plymouth Breakwater,” with the white breakers flashing at intervals over the long wall, is a fine sea-painting in his most free style of painting rough and windy sea, of which we should be glad to see a little more, as a variation from his constant run of calm weather lately. There are other good works in the collection.

THE *Pall Mall Gazette* of the 25th of February prints a long communication from a large landlord to whom is given the pseudonym of “Romney Leigh” (in reference to the capitalist reformer in Mrs. Barrett Browning's well-known poem) on the vexed question of the poor and their dwellings. “Romney Leigh” contends that the large ground-landlords are not to blame for the grinding of the poorest class of tenants, but the middle-men. He can give the names of middle-men sub-letters on his own estate, who make at least sixty per cent. on the rent which they pay to him. If those who, like Mr. Chamberlain, abuse the ground-landlords for plundering the poor would look into the matter, they would speedily discover that it is not the ground-landlords who profit by rack-rents. He complains that the ground landlord, when he wishes to do well, has not the necessary powers. Give him more authority over the leaseholders and all their sub-tenants, to compel them to comply with the covenants in the original leases. “Romney Leigh” is at present engaged in a law-suit which will raise the whole question whether the ground landlord has any authority whatever to insist on the covenants of the original lease, when the original lessee and his executors have severed all connexion with the property by sub-letting it. If this case goes against him, he is powerless to do anything until the original leases fall in, thirty years hence, when the generation we are now seeking to benefit has passed away. He has houses on his own estate which he has implored the Sanitary Authorities to condemn

as unfit for habitation. But they are technically within the provisions of the Act, and there they will remain thirty years. “Romney Leigh's” conclusion is,—increase the power of the ground-landlord, and force him to discharge his responsibilities by depriving him of his privileges when he ceases to perform the duties of his position. We hope, here be truths.

A CORRESPONDENT sends us another example of the liberalities of architectural competition as offered to a discerning profession, in the shape of what he truly calls a “degrading advertisement” in a Welsh newspaper, setting forth to architects “and others” that the Swansea Corporation will receive designs for a building to comprise Public Library, Art Gallery, and Schools of Science and Art, for which they will give a premium of 30*l.* for the best design, reserving it as their property, not binding themselves to accept any design. Nothing is said as to the architect “or other” who may gain this handsome premium, being employed on the carrying out of the work. The sum proposed to be expended is said to be about 10,000*l.* The ordinary commission for making drawings for a building on that scale would be 250*l.*; for entirely supervising it, 500*l.* The Swansea Corporation have evidently an eye to business. It is to be hoped they will meet with the kind of response their munificence deserves.

THE Fine Art Society have on view, at their Rooms in New Bond-street, a very interesting collection of water-colour sketches on the Lower Thames, below London Bridge, by Mr. W. L. Wyllie, from which are to be taken the materials for an illustrated work on the subject, with twenty full-page and thirty text illustrations in black and white. The actual title of the work, “The Tidal Thames,” conveys an erroneous impression, as the “Tidal Thames” of course extends to Teddington Lock; but the title of “The Lower Thames” was found, at the last moment, to have been appropriated. It is possible, however, that Mr. Wyllie may be able to continue his work of illustration in future up to the limits indicated by the title. The present collection of drawings is well worth a visit. No contemporary artist understands or paints shipping better than Mr. Wyllie; we might, perhaps, say, none so well. He knows the character of Thames craft thoroughly, from the large steamers to the heavy barges which swing slowly up with the flowing tide; he knows how to bring out their picturesque side without losing sight of their true make and detail; and is showing us how much of character and interest is to be found in our river highway and its traffic. The literary part of the work is in the hands of Mr. Grant Allen, who possesses the same kind of combination of qualifications as Mr. Wyllie, being a writer at once accurate and picturesque.

THE logic of the well-meaning people who are always making “bitter cries” about the destruction of ancient monuments and works of art is truly inexplicable. There has been a gentleman writing under the signature of “Pictor” in a daily paper, speaking of the destruction of ancient monuments in Egypt, and calling upon us to remember that England had for two centuries previously taken the lead in the preservation of the remains of antiquity, and instanced the abduction of what are now called the Elgin marbles as a case in point. True enough we did preserve the Parthenon sculptures from almost certain destruction, but the act of removing them from their site is precisely one of the things which the people who now declaim about ancient monuments would, if they had lived then, have opposed by all the means in their power, as a wanton desecration, as Byron in fact did.

SIR Abraham Woodiwiss died at Mentone on the 24th ult. He began life as a working mason, and amassed a large fortune by railway and other contracts. He was Mayor of Derby in 1881-2.

THE ABANDONMENT OF THE RIGHT TO LIGHT.

It appears from circumstances which from time to time come to our knowledge that many persons are not very clear as to the effect upon an existing and legal right to light of a blocking-up of windows or a pulling-down of the building. The law is correctly and shortly pointed out in the examples in Roscoe's "Digest of the Law of Light," p. 22, and it will also be found to be well stated in Gale as well as in Goddard on "Easements,"—books, perhaps, more suitable for lawyers than laymen. It may, however, prove both interesting and useful if we give a short space to this phase of the question.

As soon as a right is acquired, whether to light or any other thing, it can only as a rule be lost by either a voluntary transfer of it to another person or by a voluntary abandonment of it so that it ceases to exist at all. With voluntary transfers of the right to light we have not now anything to do; it is with the second branch of this subject that we are concerned.

And here, again, we come to another point, namely, that as a right can only be lost by the owner voluntarily abandoning it, the intention of this person so to do must be shown in order that it may be ascertained if a right to light has been abandoned. If the owner of a house in which was a window which had a prescriptive right to light were to block it up, and, at the same time were to inform all the persons living around that he abandoned any right to the light from that day forth, there would be no difficulty about the matter. But things are not done in this simple way, and when, as is usually the case, the owner of the right prevents himself from using it without any outward manifestation of his intention other than that of blocking up a window or pulling down a wall, it becomes less easy, if an attempt is subsequently made to re-assert the right, to say for certain whether the act was one by which the right was abandoned. Hence it has become the law that, as stated by Lord Chelmsford, "the right continues uninterrupted until some unequivocal act of intentional abandonment is done by the person who has acquired it, which will remit the adjoining owner to the unrestricted use of his own premises. It will, of course," continues Lord Chelmsford, "be a question in each case whether the circumstances satisfactorily establish an intention to abandon altogether the future enjoyment and exercise of the right." So that it is obvious that if A asserts he has not abandoned his right, and B, his neighbour, equally stoutly declares that A has, by his acts, shown his intention of abandoning it, no one but a judge or a jury can settle the question. How, then, is a legal tribunal to decide in such a dispute if a right has or has not been abandoned?

The Court must consider all the facts connected with the alleged abandonment. Of course, if a person pulled down his house with the obvious intention of rebuilding it, there could be little doubt of his intention. Thus, in one case a house was taken down, and a wall was left standing with holes in it, and practically the erection of the new buildings was contemporaneous with the destruction of the old. The Court scouted the idea that there could by any possibility be an intention to abandon the right. Again, in another case, the Ecclesiastical Commissioners, under an Act of Parliament by which they were bound to pull down a particular church in London, sell the materials and the site, destroyed the structure, and in the following year, when adjoining owners began to erect buildings which would have darkened the ancient lights if they had existed, it was held that the fact of the destruction of the church did not abolish the right to light, because it was obvious that the site was to be used for a different class of building; and, said Lord Justice James, "there is very little doubt that, so far as possible, the purchaser from the Ecclesiastical Commissioners will take care to preserve the rights of light." We are not now commenting on the effect of the law, but on the law itself, still it may be pointed out that it is carrying the doctrine of the existence of the right after the destruction of a building somewhat far when an old church can be pulled down, the site cleared with the intention of building, it may be, offices, warehouses, or dwelling-houses on the spot, and then that the right to the light to the old windows can be

said to be still existing when it is scarcely physically possible that the windows of the new buildings can be in the same position as those in the old.

It is stated in two cases that if lights are so destroyed as to lead other parties to alter their position under the reasonable belief that the right had been abandoned, then the law will not interfere to protect the ancient light; that is to say, a person seeing the church in question destroyed might have bought adjoining land, and erected premises on it, believing that the right of light to the late ecclesiastical building was gone. We confess it would be very difficult to say that this man had not altered his position under a reasonable belief that the existing right had been abandoned.

Where, however, a window is built up or a blank wall erected for a considerable time, then there is clearly a *prima facie* appearance of an intention on the part of the person so doing to abandon his right. "It seems to me," says Chief Justice Abbott, "that if a person entitled to ancient lights pulls down his house and erects a blank wall in the place of a wall in which there had been windows, and suffers that blank wall to remain for a considerable period of time, it lies on him at least to show that at the time when he so erected the blank wall and thus apparently abandoned the windows, there was not a perpetual but a temporary abandonment of the enjoyment." We may, as illustrative of the practical view which must be taken of an apparent abandonment, extract one of the illustrations given in Roscoe's "Digest of the Law of Light." A is the owner of a house with ancient windows; in 1837 the owner for the time being blocks them up with rubble and plaster. In 1856 (nineteen years after), B, the adjoining owner, begins to build in such a manner as would, had the windows been open, have obscured the light. A then opens his windows, and B erects a hoarding in front. A brings an action in respect of his right. The jury found that there had been no abandonment. If the windows had been actually bricked up and the wall made, so to speak, intact, then, in all probability, the jury would have found that there had been an intention to abandon the right. But when the apertures were simply filled in with a mass of plaster and rubble, it might fairly be said that the owner merely intended to suspend the enjoyment of his right, and to resume it when he thought fit, because had he intended to do otherwise he would have made permanent structural alterations. It is thus clear, also, that if windows were closed by solid permanent alterations, the fact that this had been done but a very short time before an alleged infringement of the right would weigh but little against the obvious intention of the owner of the building.

These practical remarks and illustrations will show our readers the state of the law on this important subject, and that no hard and fast rule exists as to whether or not the closing of a window or the destruction of a wall with windows causes the right to light to be abandoned. The facts in connexion with the alteration must be closely looked into, and when this has been done, probably a person of ordinary common sense will quickly be able to say whether there has been an intention to abandon a right to ancient lights.

THE DUDLEY GALLERY ART SOCIETY.

An exhibition of water-colours was opened last week in the well-known gallery in the Egyptian Hall; whether this is to be considered as a winter exhibition, or as the usual spring exhibition come before its time, we do not quite understand. The exhibition is of much the same character as we have been accustomed to see there; we fear, if anything, not quite up to the average. Some good names which were generally represented have disappeared, and one or two unfamiliar ones attract notice. Among the latter Mr. J. Smart, R.S.A., is conspicuous for a genuine freedom and power of style in the treatment of landscape, as displayed in his drawings, "A Misty Mountain Top" (165), "Glen Dochart" (79), and "Dreary December" (287), the last a very fine and original drawing. Mr. J. T. Watts is good in "The End of the Year" (141), and "Burnham Beeches" (133). Mr. Herbert Marshall contributes a fine study of "The Fore-shore at Blackfriars" (95), and Mr. Goff one of "The New Bridge Works, Putney" (29), a

good example of a Lower Thames study of this class. Mr. Walter Severn exhibits in "Music on the Lagoon, Venice" (102), one of those brilliant studies of moonlight effect in which he excels; of certain Alpine scenes, "Under the Wellhorn," and some others, by the same hand, we feel not so much enamoured; there is a somewhat sickly and conventional green about the foliage. Miss Kate Macaulay's "A Bit on the Devon Shore" (57), a study of foreground mainly, is one of the best painted bits in the room. Mr. W. Bradley's "Henley-on-Thames" (217) and "Shiplake Backwater" (245) are careful and effective, but somewhat mannered works; Henley is the best. "London Bridge and the Monument" (294), by Mr. Hubert Medlicott, is another of the same class of subjects, rather similar in character; but London Bridge requires more powerful and sympathetic treatment than in this pretty, but rather weak, drawing. Among other things we noticed "A Breezy Day in June" (304), by Mr. Weedon; "The Fish Market, Venice" (323), by Mr. D. Law; "On the Pincio" (373), by Mr. A. B. Donaldson, a brilliant little bit of colour; "The Monument to Pope Innocent VIII., St. Peter's" (123), by Mr. St. John Midmay, a good piece of architectural drawing; "Ancient Roman Arch at Aquina, now used as a Mill-dam" (457), by Mr. J. M. Donne, a good study of an unusual and interesting relic of antiquity; and one of the screens contains a minute study of sea by Mr. Brett,—minute in scale, we mean,—"A South-west Gale from the Lizard" (508), which looks like a grand sea-piece seen through a diminishing glass.

THE OFFICIAL INQUIRY ON THE PARIS BUILDING TRADE.

THE Commission of the "forty-four" appointed by the French Parliament to inquire into the prevailing distress has already held several sittings. So far the results of the investigations have only helped to demonstrate how difficult it is to obtain real knowledge of the case. When the matter had been debated by the National Assembly we showed, in an article on the subject, how the figures given by the Premier, M. Jules Ferry, differed from the estimates of the various trade unions concerned. Now, according to an equally good authority, both M. Ferry and the trade unionists are in the wrong. As the principal manager of the *Crédit Foncier*, M. Christophle's evidence, given before the Commission, is of so much importance, we will summarise his principal statements. M. Christophle estimates that there are about 25,000 employers in the Paris building trades. Many among them form associations, and obtain money, in the first instance, from the *Sous-Comptoir*, whose advances are made on land and on foundations. When the construction is somewhat more advanced they come to the *Crédit Foncier* for a further and larger loan; and, even after this, there are other banks that will lend a third time on the building. M. Christophle states that there are in all about 76,000 houses in Paris, representing a capital of 480,000,000*fr.* During the last nine years the *Crédit Foncier* has lent on building property 32,700,000*fr.* The amounts borrowed have increased enormously; thus, only 640,000*fr.* were lent in 1874, but this rose to 6,040,000*fr.* in 1880, and to 7,160,000*fr.* in 1882. The following year began, however, to show signs of decrease, for in 1883 only 5,360,000*fr.* were advanced on building property. Half this money was lent on houses that already existed, and only 16,000,000*fr.* on new houses; and, as the *Crédit Foncier* loans amount to about two-thirds the value of the houses, we may estimate that these new houses are worth about 24,000,000*fr.* Adding the cost of finishing and management, &c., M. Christophle is willing to double this amount, and thus attains a total of 48,000,000*fr.* spent in building during the last few years,—a figure which falls far short of the 200,000,000*fr.* mentioned by M. Jules Ferry, by the *Revue des Deux Mondes*, and by M. Paul Leroy Beaulieu. According to the same authority, 291 new houses were built in 1880, 265 in 1881, and 360 in 1882. The money lent on all this enterprise is refunded slowly, but peacefully; it has not been necessary to sell any of the property, and only twenty-two houses have been seized as security. From the *cotisations* levied on building materials, M. Christophle arrives at the same conclusions as to the amount of money spent on buildings. The figures are about the same as those already

given, which are based on the amounts the Cr dit Foncier has lent; but, in both instances, he is perhaps too apt to view the matter in the light of his own personal experience. M. Christophle's opportunities of judging the question, though of the most extensive character, do not, possibly, embrace the entire situation. Nevertheless the fact remains that, though the amount spent in building is very large and the increase during the last four or five years out of all proportion with the demand, it is not so great as was at first estimated. Practically, the result of the facts thus attained will be either to show that the crisis is not so acute as it was at first supposed, or else to throw a greater burden of responsibility on other than the building trades. M. Christophle inclines to think that Paris is simply suffering from a natural reaction,—a dull season after an exceptionally active season. The difficulties can be overcome: if the credit societies will make advances to those who have gone too far, and if the State will employ a larger number of men on public work while private enterprise rests itself from over speculation.

After M. Christophle the delegates of the house-decorators and painters were examined. They explained that there existed only one trade union in their corporation, though there were a number of smaller societies of about twenty members each. Actually a third of the trade was without employment, a third worked ten months in the year, and a third only eight months. The number of workmen varies considerably, but may be roughly estimated at about 10,000, of whom only 300 are regular subscribers to the trade union. They work ten hours a day from April to September, and eight hours during the rest of the year. But this winter the trade has been very depressed, and in many instances the workmen's wives have been compelled to seek work as charwomen, &c., while some of the men have offered their services as messengers, porters, &c., instead of working in their own trade. The delegates acknowledge that wages have risen considerably during the last twenty years. They were estimated at 54d. the hour in 1868; at 6d. in 1873; at 6½d. in 1877; and at 7½d. in 1880. For 1882 it was agreed that 8d. should be paid, but this was not carried out. In most cases the price is 7½d., and there are some firms that have profited by the present depression to give only 7d. or 6d. One of the workmen delegates argued that to increase building enterprises would simply draw to Paris a still larger number of foreign workmen. He would, on the contrary, even prefer to stop such works as are now employing strangers, so that Parisian industry should become autonomous, sufficing for itself without foreign assistance. The same speaker was also much opposed to State charity, which he defined as a manufactory of infirm pensioners. State assistance destroyed the sentiment of fraternity and solidarity by which workmen helped each other, and he urged that they should create mutual benefit funds such as the Parfaite Union, which already boasted of 200 members.

The delegates of the marble-cutters thought that their trade did not number more than a thousand workers, of whom eight hundred belonged to the union. Some three hundred workmen are now without employment; the day's work is fixed at ten hours, and the wage varies from 5s. 8d. to 6s. 5d. The depression in this trade continued last year, and was partly due to the competition of Belgian-working marbles which enter France without paying any duty. There are no benefit funds in this trade, and the delegates did not believe in the possibility of instituting them without the aid of the Government. A co-operative productive society had existed for fourteen years, but was now in danger of collapse through the competition of the employers. The delegates suggested that the Government should supply means to those who wished to leave Paris and return to their native country. They also advocated a severe sanitary law, which, while improving the health of the town, would create the necessity of extensive repairs, and thus provide work for the artisan class (!) They further urged that taxes on articles of primary necessity should be remitted, that the time of labour should be reduced to eight hours, and the housing of the poor rendered possible by imposing a heavy tax on all unoccupied apartments. Finally, contracts should be given to the workmen's unions and not to private speculators.

The delegates of the stained wall-paper trade

asserted that there had been a gradual falling off in their business since 1876. Nevertheless, the depression was not so severe last year as in 1882, for it appears that a new market for the sale of French paper was opening out in America. There are in all about 370 workmen engaged in this trade, and they nearly all belong to the union. Though this is the busiest time of the year, a fifth are without employment. The ordinary wage is 5s. 3d. per day, and the union gives 1s. 8d. per day for two months to members out of employ. The delegates complained that new machinery had injured the position of the workmen, and that they had also suffered from a number of legal squabbles relating to patents taken out for the manufacture of especially rich papers. The treaties of commerce also failed to protect this industry from foreign competition.

While the Commission of the forty-four gathered the above evidence, the delegates of forty-five Paris trade unions met at the Salle Horel and reaffirmed the programme of the Socialist Federation of French Workmen, which we have already described in these columns. Every delegate condemned the principle of free contract, and insisted on State intervention. Thus they proclaimed the necessity of establishing a minimum wage, and that it should be illegal to employ workmen under the town tariff. Extravagant as these opinions may seem, they are the outcome of a representative meeting, and such views are not confined to Paris, but have also taken deep root in many provincial districts.

THE BUILDING OF TOWN HOUSES.

CANTOR LECTURES, SOCIETY OF ARTS.

MR. R. W. EDIS, F.S.A., delivered the first of a course of three Cantor Lectures on this subject on Monday, the 18th ult., in the hall of the Society of Arts. He observed that the speculative builders,—and under that term he included not only the host of small men who helped to raise, fungus-like, the streets of densely-built cottages and fourth and fifth rate houses which disgrace our suburbs, and form the houses of the bulk of our working-classes, but also those larger capitalists who have carried out, in the last twenty years, the innumerable streets, squares, and terraces, in our more fashionable quarters, and whose erections, from an art point of view, are, to a large extent, equally to be condemned,—had too long had their way without control of any kind, save that which is provided for under the Metropolitan and other local Acts, and which simply permitted of the district surveyors insisting upon certain thicknesses of walls, but gave them no power to reject inferior materials, or to prevent the too-often "scamped" and utterly unsound work, or the utter disregard of all known sanitary laws. It was, the lecturer thought, high time that every house erected in great centres of habitation should have some systematic supervision during its construction, so as to ensure its fitness for occupation. Within the last few years the Metropolitan Board of Works had recognised the necessity of seeing that all buildings of which the drawings were submitted for their approval were thus supervised, and they had a special officer whose duty it was to see that the specification was properly carried out, and that sound and proper materials were used; but this supervision was extremely limited, as it only applied to buildings carried out on the property of the Board. In all towns there were, it was true, certain local Acts which, to a limited extent, insisted upon a minimum amount of cubical contents and a minimum height in the various rooms, and upon certain minimum superficial contents in the back areas; they also required that some sort of sanitary arrangements should be carried out, so far as drains, &c., were concerned, but these requirements were often evaded. In the building of new houses and the reconstruction of old ones it was essential that proper regard should be paid to the rapid growth of sanitary science. If Government could not take up the work of supervision, and provide for such competent inspectors as might be necessary (and whose business it should be to certify that every new house erected was built of sound materials, was properly drained and ventilated, and, in fact, that it was a healthy habitation), surely it would answer the purpose of a private company to take up the matter on a large scale, and, for some moderate fee, make

a proper inspection of any building and certify as to its general soundness and its fitness for occupation. Practically there was no real supervision of a vast proportion of the houses we lived in; perhaps one per cent. of the houses erected were designed and superintended by a competent architect, the other 99 per cent. being left to the tender mercies of the ordinary speculative builder. Even where an architect was employed, the ignorance of some Jack-in-office, or the absurd requirements of a local Vestry or Board, or of an estate-agent, bound him with red tape, and fenced him about with difficulties and requirements which acted prejudicially not only to the individual lessee, but to the whole of the surrounding district. It was earnestly to be hoped that within the next few years a law would be passed compelling the ground landlord to enfranchise, on terms equitable alike to himself and the building-owner, so as to prevent, as far as possible, any really unfair interference, which is based on supreme ignorance or the mere exercise of power of brief authority. All legal restraints on the part of property owners, or on the part of local authorities, which were based merely on caprice or ignorance, must, sooner or later, be swept away. The common sense of the people, their necessities and requirements, based on higher knowledge, will insist that the monopoly of sites in crowded towns shall not be vested in the hands of a few individuals without the lessees having the right of equitable redemption of the ground rentals. The present system of leasehold tenure in England generally was as iniquitous as it was unjust, leading, in many instances, to inferior work, overcrowding, and general badness of building, and, by the narrow-mindedness and ignorance of grasping agents, to the setting aside of all modern improvements in building and construction. While it was necessary to have a uniformity of, and strict compliance with, sanitary regulations, it was by no means necessary, and very far from desirable, to attempt to exact anything like an approach to uniformity of design in our houses, while to sacrifice internal comfort, light, and ventilation to some special order of fenestration, Greek, Roman, or Italian, or to the cramped and narrow lines of a Medieval fortress or building of bygone ages, was evidence of nothing but poverty of thought or narrow-minded conventionalism, as much opposed to all true principles of architecture as to the wants and requirements of the people of the nineteenth century. Comfort and convenience of arrangement; ample light and ventilation everywhere; protection from damp and miasma and impure and unhealthy smells; provision of the means of warmth; freedom from draught; adequate ventilation; and a supply of pure water were first of all to be considered in every house. The elevation should be subservient to the plan and the constructional requirements necessary for the provision of all the desiderata mentioned. Having quoted from the writings of Dr. Richardson to show the extent and variety of disease arising from unhealthily-built and ill-arranged houses, the lecturer insisted upon the great sanitary value of sunshine, which could never enter rooms of certain aspect without the use of semi-octagonal or circular projecting windows, with side lights. Yet these projecting windows found little favour with local authorities. There was no sound reason why such projecting bays should not be allowed, provided that they were so arranged that they did not look into each other. Why, too, could not the backs of our houses be made more decent, if only by means of glazed bricks, varied occasionally with bands of colour. Of course glazed bricks were more expensive than common stocks, but the extra expense would be more than repaid by the extra light and better air, for the glaze made the bricks non-absorbent, and every shower of rain washed the walls faced with them clean. The laying out of streets and squares in towns had changed very little in the last few hundred years, but why should we not have every new house in such places as Berkeley and Grosvenor squares built with projecting oriels and bays, and with high-pitched gables? The former would add materially to the light and comfort, not to say anything of the artistic character of the rooms, while the latter would surely be preferable to the generally miserable so-called dormers, which were, as a rule, set back behind the balconies or parapets in the attics of most town houses; these, it was often said, were "quite

good enough for servants!"—a selfish, cruel, and even suicidal view, for if we were to have servants in health and fitted to carry out their daily occupations with comfort to themselves and justice to their employers, their rooms should be just as light, airy, and cheerful as any others in the house. It was matter for congratulation that there was at least one large owner of land in London who set a good example on his own property by encouraging, in every way in his power, a departure from the old-fogeydom of street design. He referred to the Duke of Westminster, who encouraged the use of projections and gables, and the introduction of modern improvements in building. All town houses must necessarily be influenced by local conditions, and these conditions must materially influence all questions of general aspect. With regard to external design, he did not insist upon any particular period or style of architecture; indeed, it must be more or less eclectic if we wished to combine in the façades of our buildings the excellences of the past with the improved materials and appliances of the present. But he did strongly insist that the external design should and must be subservient to the internal requirements,—that light, air, ventilation, and common sense requirements should in no way be sacrificed to the external design; for no beauty of mere architectural effect would compensate for discomfort and bad internal arrangement. Gothic tracery and pointed openings were not suited to ordinary sash-windows, and it surely was inconsistent with modern street design to attempt anything in which one or another of the so-called "Five Orders" of Classic architecture had to be worked into a house in which the frontage was perhaps 18 ft. or 20 ft. at most. Where this sort of thing was attempted in the beginning of this century in the terraces of Regent's Park, generally two or more houses were embraced in the design,—a manifest inconvenience and absurdity when one owner wanted to paint his front red and the others wanted to have theirs yellow. The vulgarity and unartistic pretentiousness of the host of modern buildings erected in our fashionable suburbs in imitation of Italian palaces or Roman temples, with sham plaster columns, gigantic pediments, and nameless cornices, could not be too strongly condemned. The fashion of the present day was running into modern Dutch, or so-called "Queen Anne," and inasmuch as this style permits of ample fenestration, and does not limit the size of light openings, and relies for its piquancy and character on honest red brick instead of sham plaster and vulgar imitation, we may be thankful for the revival of a sixteenth and seventeenth century Renaissance school of architecture, which gives us at least colour and picturesqueness in our London streets. We could obtain readily in London first-class red bricks or terra-cotta, and both these materials are more lasting and more suitable to London smoke and the deleterious action of the London atmosphere than almost any stone which exists. Glazed and coloured brick and faience and terra-cotta admit of almost any variety of design, and give picturesqueness, warmth, and colour where all are wanted. If importance is wanted in an elevation let it be obtained by good sculpture in such portions of the buildings as are nearest the eye-line. A porch properly treated with good modelled decoration, either in figure or relief ornament, can be made as imposing as you like, while balcony-fronts can be of good wrought-iron, like some of those in the old picturesque towns of Spain and Germany, instead of being lumpy and heavy with balustrading which not only shuts out light and prospect from the rooms, but suggests an element of danger by its utterly false and generally insufficient construction. So far as his experience went, the public generally were unaware of the real advantages and merits of terra-cotta as a material for facing street-fronts. It was greatly superior to ordinary brick or stone as a building material in crowded towns. In the first place, when properly burned, it was absolutely impervious to smoke, and was unaffected by acid fumes of any description; it was about half the weight of the lightest building stone, and its resistance (when burned in solid blocks) to compression was nearly one-third greater than that of Portland stone. It was non-absorbent, and readily moulded into any shape. Within the last two or three years Mr. Holroyd, of Leeds, has materially improved the glazing of terra-cotta and fireclay, and under the name

of "Barmantote's Faience" he is producing most excellent material for external and internal work, for which almost any colour of glazed ware could be readily obtained, at a price very little in excess of good Bath stone. As to iron railings, the lecturer strongly condemned the hideousness of most of those to be seen in London, and pleaded for the greater use of artistic wrought-iron work, particularly as it was to be had for a very small extra cost. It would, said the lecturer in the course of his concluding remarks, seem as if the sense of sight and the love of the beautiful, when applied to ordinary everyday matters, were not appreciable elements in the ordinary English character, or it would be impossible to believe that, year by year, we should be content to accept and pay for things which were not only vulgar and commonplace, but inartistic and detrimental to any real improvement in our street architecture.

In his second lecture, delivered on Monday evening last, Mr. Edis treated of the planning, sanitation, lighting, heating, and ventilating of town houses. Having pointed out how the due consideration of all these points on the part of architects and builders would conduce to the comfort of the occupiers and save the labour of servants, he graphically described some of the many annoyances experienced from the lack of this consideration. He then went on to point out that while many people were obliged, by business and other exigencies, to live in certain districts, they practically had to take what they could get in the way of houses, and to take them, more or less, on trust, not being inclined, even if the landlord would permit it, to have a house pulled about and thoroughly examined, and then, if they did not like what they might find, to make good all damage, at great cost. It was not fair to ask the incoming tenant to pay for professional advice on such points, unless he knew what he was about to take, and was prepared to add to his yearly rental, for the term for which he took the house, by sinking a certain sum of money in making good the manifold defects of a house, and, in fact, doing the landlord's work,—true, for his own present comfort, but for the ultimate benefit of the landlord, who not only accepted without thanks or return of any kind all improvements made by the tenant, but put in a claim for dilapidations on the expiration of the lease.

All this sort of robbery,—for it was nothing else,—demanded Government interference. The tenant should have the right to recover for all work done which could be shown to have been absolutely necessary for the healthy enjoyment of the house,* which had to be taken on trust as to its sanitary condition. If some law enforcing this could be passed we should have less bad building and fewer unsanitary houses, and when he (the lecturer) spoke of unsanitary houses he meant houses that were unsanitary not only from bad drainage, but from improper and unsound fittings, bad ventilation (there was usually none at all), and the generally scamped nature of the work. It was gratifying to find that "Sanitary Aid Committees" were being formed in various parts of London in connexion with the Mansion House Council, for the purpose of bringing to the notice of the officers of health of the various metropolitan vestries all houses which contained in themselves nuisances not only dangerous to the individual occupiers, but to the community at large. These committees were publishing information as to the powers of the existing Acts as bearing upon the duties of landlords. He believed that a Bill had lately been introduced into the House of Commons to provide for a more better and more systematic supervision of all new buildings, whereby a tolerably sound construction might be insured,—for instance, that the foundations be dry, and a proper damp-course inserted; that the drains should be laid of adequate size and to a proper fall, and properly ventilated and cut off from the main sewer, so that there be no direct communication between the house and the drains; that all closets, slop-sinks, &c., shall be in proper situations, and properly ventilated, and not opening direct into the house from the top of the staircase, as was often the case in many houses built fifty years ago. In short, the object of the Bill was to carry out some such general scheme of sanitary arrangement as was shadowed forth in the previous lecture. It was

* Something of this kind has been advocated in the *Builder* (see p. 52, ante).—Ed.

much to be feared, however, that the question of the appointment of the inspectors under the Bill (if it passed into an Act, and so became law),—which was to be vested in the various local vestries or boards, subject to confirmation by the Local Government Board,—would be a rock on which there would be much foundering of good intentions. Inspectors qualified for all this sort of work must be men of position and standing, with ample general knowledge of all the details which went to make up the sanitary well-being and construction of the house, able to hold their own against all official Bumbledom and bullying,—men *sans peur et sans reproche*,—anxious to carry out their duties conscientiously. Such men could only be obtained at good salaries; but he believed, from personal knowledge, that with proper business-like control and management, ample funds might annually be saved by the Vestries from the present rates to pay a staff of such competent inspectors as he had referred to. Coming to the immediate subject of the lecture, Mr. Edis observed that good planning meant not merely the arrangement of a certain number of rooms on a certain number of floors, but careful and close attention to the general domestic requirements and arrangements of the ordinary household, and to all smaller details which made up the comfort and convenience of the houses. It meant that every foot of space should be properly laid out; that there should be no dark corners and no inaccessible places in which cisterns or lumber were to be stored; that every room, closet, and staircase should have ample light and ventilation; that staircases should be conveniently arranged, easy of going, with broad landings, and of sufficient width to allow of passing easily. Each room had to be considered, and its relative proportion and position in the plan. The dining-room should be so arranged that, although above the kitchen level, it was not at any unreasonable distance, so as to avoid labour and risk of accidents in the service. If it were possible in an ordinary town-house of the first or second class, the dining-room should be placed at the back, for as it was rarely used except at meal-times, a good outlook was not necessary, while in summer-time the opening of the windows would not cause the dinner party to be overlooked from the street. Next the dining-room should, if possible, in every house, be arranged as a small service-room, with a light service-lift from the basement, with a light descend not into the kitchen itself, but into a small china closet or pantry, close to the kitchen, so that it might not act as a funnel or shaft for the ascent of the smells from the kitchen. In the service-room should be a small hot-plate, heated by gas, so that the plates might be taken hot into the dining-room. It should also be fitted up with sink and onboards for the washing-up and storage of glass and china, so as to save time, labour, and risk of breakage. If this special service-room could not be provided, a small lift might easily be arranged in the buffet, or at one end of the dining-room. To the lift a speaking-tube or electric bell, or both, should be attached. As a rule a dining-room must have a central light over the dining-table, but this should not be of such a size as to impede the view from either end, or to throw down a great amount of heat on the heads of those who sit around it. A small light, with shade made to throw its rays direct upon the table, with—if gas be used,—side brackets next the side-board and on either side of the mantelpiece, so as to distribute the light all over the room, was infinitely better than a great blaze over the table. Nothing was so unpleasant in a dining-room as the heat, which too often in London better and more systematic supervision of all new buildings, whereby a tolerably sound construction might be insured,—for instance, that the foundations be dry, and a proper damp-course inserted; that the drains should be laid of adequate size and to a proper fall, and properly ventilated and cut off from the main sewer, so that there be no direct communication between the house and the drains; that all closets, slop-sinks, &c., shall be in proper situations, and properly ventilated, and not opening direct into the house from the top of the staircase, as was often the case in many houses built fifty years ago. In short, the object of the Bill was to carry out some such general scheme of sanitary arrangement as was shadowed forth in the previous lecture. It was

* Something of this kind has been advocated in the *Builder* (see p. 52, ante).—Ed.

kept back by a piece of fine silk or wet sponge. These tubes were often put in much too small, and the size of the outside gratings was not considered. In all cases the size of the tubes should be proportioned to the cubical contents of the rooms, and the external grating should be practically twice the area of that of the mouth of the tube, as the ironwork of the grating, as a rule, diminished its usefulness in ventilating area by about half. If it were not possible to arrange for an extract-shaft in the ceiling, a large-sized ventilator might be put in the flue over the fireplace, provided always it be fitted with talc flaps to prevent all back-draught. In large rooms the fresh air may be brought in over hot-water coils fitted as seats in the window openings, and controlled by proper regulating-valves. The lecturer had recently had this system admirably carried out for him, in the new Ball-room at Sandringham. In ordinary houses no feature was so wanting in thought as the arrangement of the staircase. As a rule the front door opened from the street into a narrow passage-way (with, perhaps, an internal screen with folding-doors, which were rarely shut), and immediately opposite was the main staircase of the house, so that any one entering not only commanded the absolute thoroughfare of the house, but saw everybody who went up or came down, by which the privacy of the house was materially interfered with, and the whole house was made subject to sudden draughts of cold air, which were driven up the well-hole, as it was called, by the opening of the street-door. There was no reason why the ordinary narrow entrance-passage should not be increased 2 ft. or 3 ft., so as to make a moderate-sized hall, in which there might be placed a fireplace with ventilating grate, which would help to supply warm fresh air all over the house; and by a little care in planning the first flight of stairs at least might be screened from view. The staircase itself, whether it be of wood or stone, should never rise more than 6½ in. to each step, and, if possible, a landing or resting-place should be arranged every twelve or fifteen steps. The half-landings in ordinary London houses were insufficient, and all winders were fatal to a good staircase. The library might be arranged as a comfortable and quiet apartment at the back, while the front space might be devoted to the morning or general reception room, in which all the cheerfulness which the outlook into a London street gave should be obtained. But the entrance and hall should not be sacrificed entirely to these two rooms. An extra foot or two in the passage-way would not only make a house more imposing, but would materially add to its comfort and convenience. The basements of London houses were generally so badly arranged and ventilated that they added materially to the stuffiness of the whole of the house. The whole surface of the ground under them should be covered with concrete, and proper damp-courses and ventilating air-bricks should be provided. The scullery should, as a rule, form part of the kitchen, where the kitchen was not used for servants' meals and sitting-rooms; it should not be shut off from the kitchen except by a low glass screen, so as to be under the immediate supervision of the cook, and not, as was so often the case, a small, dark, unpleasant, and ill-ventilated hole, in which unpleasant smells were supposed to be allowed. The whole of the scullery walls, and, as far as possible, those of the kitchen, should be lined with glazed tiles, and proper means of supplying fresh air and extracting foul air should be provided. Pantries and larders should also be lined with glazed tiles, and have slate or polished marble shelves; they should also have continuous currents of fresh air passing through them. In every basement a comfortable room for servants should be provided as a sitting-room, fitted up with book-shelves and cupboards, and, if possible, facing the street, so that the workers of the house might have some sort of spare room in which they might be at rest from their ordinary duties; for if people wanted good servants they must treat them as fellow-beings. It was hardly fair to leave them for all hours in the heated atmosphere of the working-rooms. The kitchen department should, as far as was consistent with proper and quick service, be shut off from the staircase of the basement, as this naturally acted as a funnel up which all smells ascended, so that when the door at the top

which opened into the hall was open, they escaped and permeated the whole house. A swing door could generally be arranged at the bottom of these stairs, closed with one of those American valve springs which close the door at once without allowing it to bang. Too much care could not possibly be taken in providing all the necessary conveniences in every house in the way of store-closets, conveniently arranged near the kitchen, and properly ventilated. Every water-closet should be thoroughly ventilated, and all sink and bath wastes should be cut off from direct connexion with the drains. All drains should be laid and bedded in concrete, and have manholes at each end for purposes of inspection and cleansing. The drawing-rooms of a house should naturally be made as cheerful as possible, with the doors arranged so as to allow of the proper circulation of guests when the rooms were crowded. The arrangement of windows and fireplaces should be carefully studied so as to allow of sufficient wall space for furniture; and in these rooms big and recessed windows and cosy nooks will help to keep them more livable and comfortable. As a rule be thought two fireplaces were a mistake, unless the rooms were absolutely divided by doors or *portières*, for when only one fireplace was alight there was a tendency for it to act as a pump and to draw down smoke through the other one. While the possibilities of planning in street houses were more or less limited by the nature of the sites, all ordinary houses could be materially improved by a careful study of the wants and requirements of the ordinary householder. In every house, on every floor, means should be provided for thorough ventilation from back to front. As a general rule London bedrooms were very often badly arranged, and the lecturer was inclined to think that the modern system of arrangement in French bedrooms might with advantage be more frequently carried out in town houses, so that the rooms might be available for the double purpose of private sitting as well as bed rooms. The bedroom might be divided up so as to form at one end,—that farthest from the window,—recesses for bed and washing closet, which could be screened off in the day-time by a curtain; and the rest of the room might be fitted up as a sitting-room. Dressing-rooms might with advantage be made larger than was usually the case; they should be of sufficient size to hold a bed if requisite. The nurseries of a house should be cheerful, well lighted, and well ventilated, and opening into each other. The servants' bedrooms in the attics should be made as comfortable as possible, and the roof so constructed as to prevent extremes of heat and cold being felt by the occupants. Somewhere in the top floor a box-room should be provided; and a cistern-room, easily accessible, and with a top light, was an essential in every well-found house. The lecturer, in conclusion, detailed the arrangements that should be made for carrying up hot and cold water-pipes, gas-pipes, bell-wires, speaking-tubes, &c., with safety and in such positions as to be readily accessible.

ANCIENT SCULPTURE.

ROYAL ACADEMY LECTURES.

PROFESSOR C. T. NEWTON, C.B., gave his first lecture on this subject at the Royal Academy on the 21st ult., and dealt with the monuments of ancient art which have been discovered between the time of Winckelmann [1717-1768] and 1850, reserving for his second lecture the description of the discoveries made subsequent to the latter date.

The lecturer said he regarded ancient sculpture with the eye of an archaeologist rather than with the critical knowledge of a modern artist; and regarding the archaeologist as rather a purveyor for artists and critics than as himself a critical authority, he would content himself with laying before students an aggregate of facts, and furnishing them with the dates, sources, subjects, and circumstances of works of art. The archaeologist, he explained, studies not only museums, but also the sites whence come the objects with which museums are filled, and the manner of their discovery. Thus isolated works recall to him other works which stand in relation to them,—one statue illustrates another, one fictile vase recalls a second, and out of one germ the imagination creates a whole series of further developments. By this means he acquires the habit of mind

which enables him to classify all he sees, to assign a certain or approximate date to every object, and to have ever before his mind one vast scheme of museums, through which he looks down the vistas of ancient centuries, and recalls in historical sequence phase after phase of past life.

Museums did not spring into life with Winckelmann. They grew up gradually from the beginning of the fifteenth century. Before noticing the attempts made to form them, it would be well to trace briefly ancient art in its germ, growth, and decay. It grew up like a flower in genial soil, flourished for a period, and then died. Greek art probably began about 800 B.C., and, freeing itself from Phœnician and Assyrian influence, reached its perfection in the fifth century B.C., the age of Peidias and of Pericles. From this period until a hundred years later it maintained its glory and beauty; for, complete harmony reigning between the political institutions and the religious faith of the Greeks, the State did honour to the gods, and the artists spent nearly all their time upon votive architecture and sculpture, working with a religious feeling and for a religious purpose, supplying the temples with figures of the gods, and with dedicated objects. These temples lasted from century to century, and became overcrowded, much like our modern museums; although, after the time of Alexander, art was employed more for gratifying the taste of private persons and less to please the gods, and so we found artists stimulated by the patronage of private collectors. Then followed the Roman conquest, when piratical consuls and generals took away the spoils of the temples in Greece and Asia Minor to ornament Rome. This taste led to copies being made for Roman villas and provinces, until the downfall of the Roman Empire in the fourth century A.D.

But for the depredations committed by the Romans, the Greek temples of Hellas remained intact until the third or fourth century of our era. Then Christianity won the ascendant, and Christian emperors handed over the property of the temples to the churches. Fire and earthquakes destroyed other portions, and the iconoclast was rampant everywhere in the work of destroying statues. Constantine the Great carried off many fine works of art to his new capital, where they remained until destroyed by fire when the Crusaders took Constantinople. The darkness of the Middle Ages swallowed up the rest of Greek art, and all disappeared, save the gems and gold and silver ornaments which the Church marked with the cross, and preserved in her sanctuaries for her own benefit.

In the thirteenth century came the first rays of a revival of art. We hear of an archbishop at Pisa, towards the close of this century, who arranged a number of ancient sarcophagi in the Campo Santo there. In the fourteenth and fifteenth centuries Cosmo, Lorenzo di Medici, Petrarch, and Rhenzi called attention to the monuments of ancient art still extant in the Imperial city. Roman nobles carried on excavations all over Rome in order to adorn their palaces, and many interesting sculptures were found, such as the Farnese Torso, the Venus de Medici, and the Dying Gladiator. The first systematic museum was made at Rome by Pope Clement XI. early in the eighteenth century; and in the middle of the same century another museum was formed by Winckelmann in the Villa Albani.

In the first period of archaeological activity a good deal was done in wrong directions. Taking the works of Pliny as their guide, scholars assumed when they found a statue corresponding in subject with one noticed by him, that it must be the original work which he described. This mistake was made in the case of the Niobe group, and other statues, whereas the Laocoön was almost the only subject of all those found in the fifteenth and sixteenth centuries, which had any real claim to rank as an original work known in ancient times. Thus the figure misnamed the Dying Gladiator is really a Gaul from a group executed by the Pergamene school; and the group supposed to be Arria and Pætus is a Gallic chief and his wife. Again, the reading of Plutarch's "Lives" created a demand for portraits of the worthies of Greece and Rome, greater than the supply, and so many were manufactured for sale to ignorant amateurs. Another mistake arose from the large number of stray bodies, arms, and legs of statues which were found in

the excavations. These were indiscriminately put together to make statues, many of which were brought to England in the seventeenth and eighteenth centuries, and still form a part of English collections. Museums all over Europe were full of such errors and unclassified truths until the time of Winckelmann. He saw, it is true, through a glass darkly, but nevertheless it may be said of him that he was the first to distinguish the characteristics of true Greek art from those of debased Roman imitations. He did this by recognising the perfection of taste and purity of beauty inherent in Hellenic works. The disentanglement of Pompeii and Herculaneum had been begun before Winckelmann came to Rome; but he took the greatest interest in the work then carried on, and had the opportunity of comparing the mural paintings of Pompeii with those of Rome. After developing the collection of the Villa Albani, he wanted to visit Athens, and to explore Olympia. But he died before this desire was fulfilled, and it was not in Italy, but in England, in the seventeenth century, that the movement to visit Greece was most strongly shown. Ever since the time of Charles I. the English had not been insensible to Greek art, although the taste for it had declined under the Commonwealth. The Earl of Arundel formed a collection of statues, in which the beautiful female bust which is now at Oxford held a place of honour; and other English collectors fanned the flame until the year 1738, when some gentlemen formed the Society of Dilettanti. This society sent Chandler and other artists to Asia Minor and to Greece, and Chandler was the first to visit Olympia in 1770. Between 1760 and 1790 Stuart's "Athens" was published,—a great work, which revealed Greek architecture to an astonished public. Ruins of Roman architecture had been known previously, and the porticos of Rome had been applied to eighteenth-century churches in London; but Greek architecture was only now known and studied, and it dawned upon England like a revelation.

Early in the present century the marbles of the Parthenon were bought by the British Government from Lord Elgin. These may be regarded as the greatest gift which any country has ever made to its museum, for they represent beyond all other existing works the age of Pericles and the work of Phidias. In spite of the loss of the centre of the Eastern pediment and of many of the sculptures of the Western, enough is left to enable us to study it as a whole, and to trace the poetry of the frieze,—a composition more extensive and more poetical than any other extant ancient frieze. The next discoveries were made by Mr. Cockrell and his companions in 1810-12. They found the frieze of the Temple of Apollo Epicurius at Phigalia in Arcadia, and the figures from the two pediments of the Temple of Athens at Egina.

From 1812 and onwards museums grew by fits and starts. In 1825 a new goddess sprang from the island of Melos, the Venus which is the glory of the French Museum. Whether she be Praxitelean or later than Alexander, we know nothing so beautiful as the nude part of her figure. In 1829, during the French expedition to the Morea, a partial exploration of Olympia led to the discovery of a metope on the site of the Temple of Jupiter. Between 1830 and 1840 the Acropolis at Athens was cleared of the modern buildings which encumbered the site, and here the temple of the Wingless Victory was discovered with its balustrade, on which were sculptured in high relief beautiful figures of Victories. These may belong to a great school of sculpture a little later than Phidias.

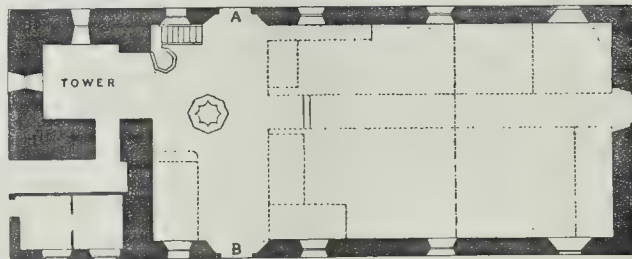
The lecturer then dealt with the decade from 1840 to 1850. In 1842 Sir Charles Fellows made some valuable discoveries in Lycia, and found a new style of sculpture, which may be regarded as a provincial style derived from Athenian models. Among those brought to the Museum are the Harpy Tomb and the Nereid or Ionic Monument. The date of the latter monument is not settled, but the lecturer was not disposed to place it earlier than 400 B.C. The first instalment of marbles from the Mausoleum was sent to the Museum by Lord Stratford de Redcliffe, 1846, consisting of that portion of the frieze which was built into the Castle at Budrum. In conclusion, Professor Newton drew attention to the collateral illustration which archaeology derives from subordinate branches of ancient art. We have to study ancient sculpture in connexion with fictile vases, terra-cottas, coins, gems, and mural

paintings. Of all these classes the one in which least progress has been made towards scientific classification is the science of gems. This arises from the fact that they can be so easily imitated, and that so few criteria can be fixed as to their genuineness. They are not, like coins, a science always moving on, the true basis, with inscriptions of classical archaeology.

CHURCH DECORATION, BASSESTORF.

THE Church in Bassestorf, a little village in Canton Zürich, Switzerland,—is in its exterior remarkable for nothing but extreme simplicity. The ground-plan is an oblong of 27 metres long by 11 m. wide. At the choir end 6 m. of the length are taken up by the tower and two rooms and a passage. One of these rooms serves as a chamber of detention, which, thanks to the orderly state of the population, is seldom used. On the opposite side, under a double flight of steps leading to the gallery, is the principal entrance to the church; besides this there are two doors at the side. The interior represents an undivided hall, 20 m. long by 9.50 m. wide and 6 m. high. Opposite the pulpit is a gallery 7 m. wide. Although the interior is simple it is not entirely without beauty, possessing a warmth of colouring, quite a contrast to the usual white-washed walls of the Reformed churches. This is principally due to the wooden ceiling and wainscoting, which have assumed a rich brown colour. Besides this the balustrade and the ceiling under the gallery have been modestly painted in grey-blue on toned white, causing on the whole a good harmony of colour.

To find a suitable way of heating the church was the original cause of the present renovations. The wooden ceiling is to remain, although



Plan of Church, Bassestorf.

the first idea was to replace it with one of plaster. The wainscoting is to be renovated, new seats are to be supplied, and the irregular floor is to be made even. The arrangements for heating with hot air are to be made in the above-mentioned chamber, the removal of which out of the church has long been wished.

Above the wainscoting are to come paintings in *graffito*, shown in our illustration, and these will call for some slight alterations in the wood-work; for instance, the cornice will be continued straight round, which is not the case at present.

The arrangement of the paintings presented some difficulties on account of the irregularity of the pillars and windows and the large openings necessary for the introduction of warm air, especially as the walls themselves were not to be altered. The painting commences directly above the cornice of the wainscot, and has been treated in perspective; the tablets are also painted, no relief work whatever has been used. Above the cornice, at intervals all round the church, are the tablets on which different Scripture texts are written. The upper cornice forms at the same time the parapet for the dwarf gallery, and the impost moulding of the windows on the three other sides. These long arched windows (semicircular) reach down to the wainscot.* To match the arched opening for the choir is painted a corresponding arch, through which is to be seen the representation of Jacob's ladder. The dwarf gallery runs the entire width of the choir end, and on each side, until over the side doors it is discontinued. The two scenes given in the illustration represent—to the left, the "Prodigal Son," and to the right, "Christ blessing little children." Over the right door the worshipping shepherds; over the left door are depicted the "Money-changers"

* Above the tablets on the choir side are the three raised openings for the hot air.

in the Temple." Besides these paintings, on each of the long sides of the church between the windows, and corresponding to them, are two principal pictures representing the "Crucifixion" and the "Ascension." The general drawings of all the architectural parts and the designs for the pictures are executed by Herr Alexander Koch, the architect; the figures by Herr Freitag, master at the Gewerbe-Museum in Zürich.

The portion of the design shown in our engraving is the end wall at the tower end of the church, as it would appear in elevation if a cross section were taken through A B. It is engraved by Mr. J. D. Cooper from a photograph kindly furnished by Herr Koch.

PUGIN STUDENTSHIP SKETCHES.

WE give this week two more of the sketches by Mr. J. G. Sankey, the winner of the Pugin Travelling Studentship this year: the chapel of the Red Mount, Lynn, showing a good, clean freehand sketch of vaulting; and a characteristic bit from Haddon Hall.

HOUSE, CARLISLE.

WE give an illustration this week of a new residence now in course of erection in Chatsworth-square, Carlisle, for Mr. W. H. Scott.

The plan arrangement is simple, the morning and dining rooms being placed on the ground-floor, as are also the kitchens, which are conveniently arranged for serving, without taint or smell of cooking operations, reaching the principal hall. The drawing-room is placed on the first-floor, stretching the full length of the frontage to Chatsworth-square.

NEW SCANDINAVIAN CHURCH, LIVERPOOL.

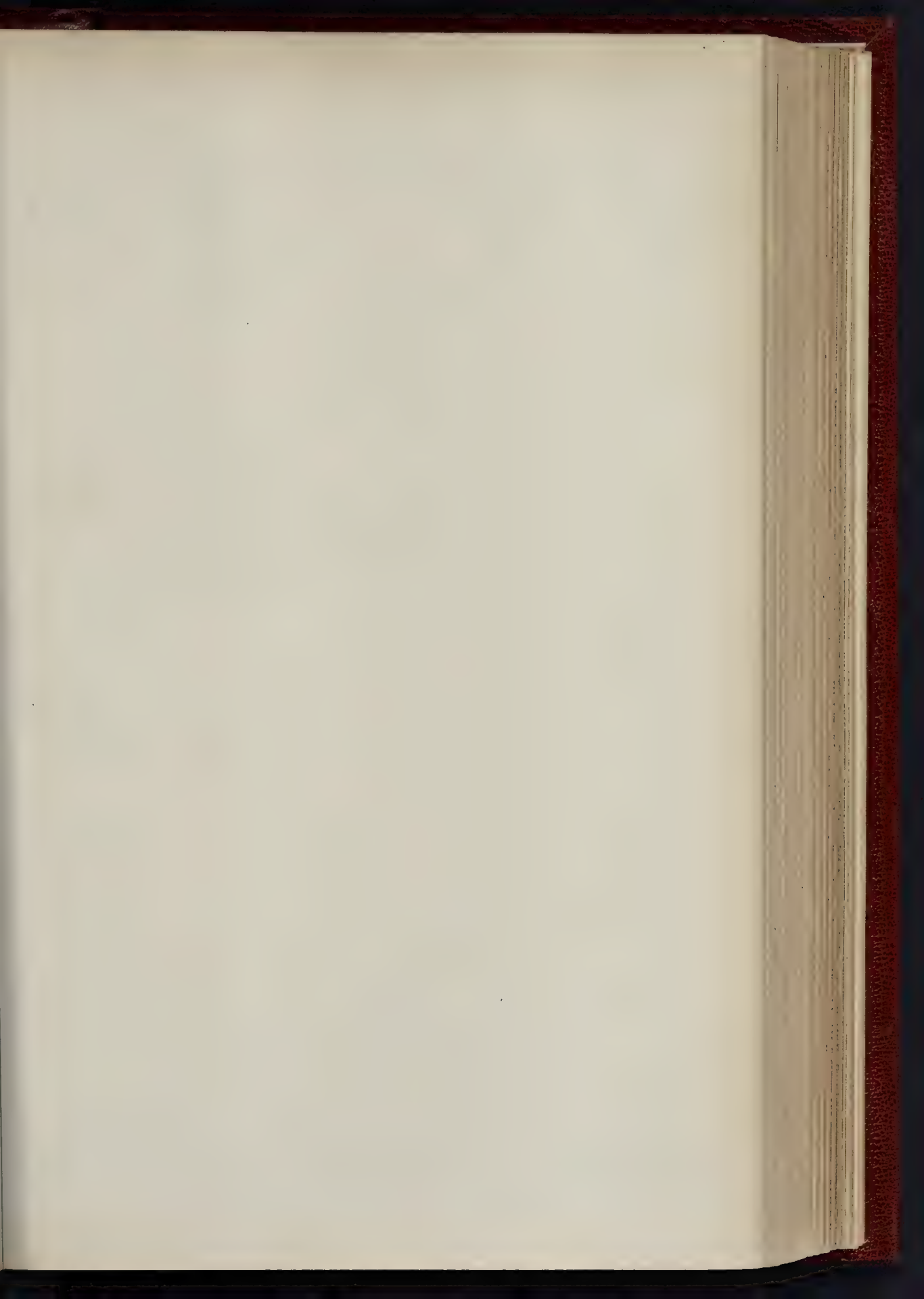
THIS church is being built in Liverpool by the Foreign Missionary Society of Stockholm, aided by contributions in this country, for the use of the Scandinavian sailors and emigrants, of whom about 50,000 annually visit the port.

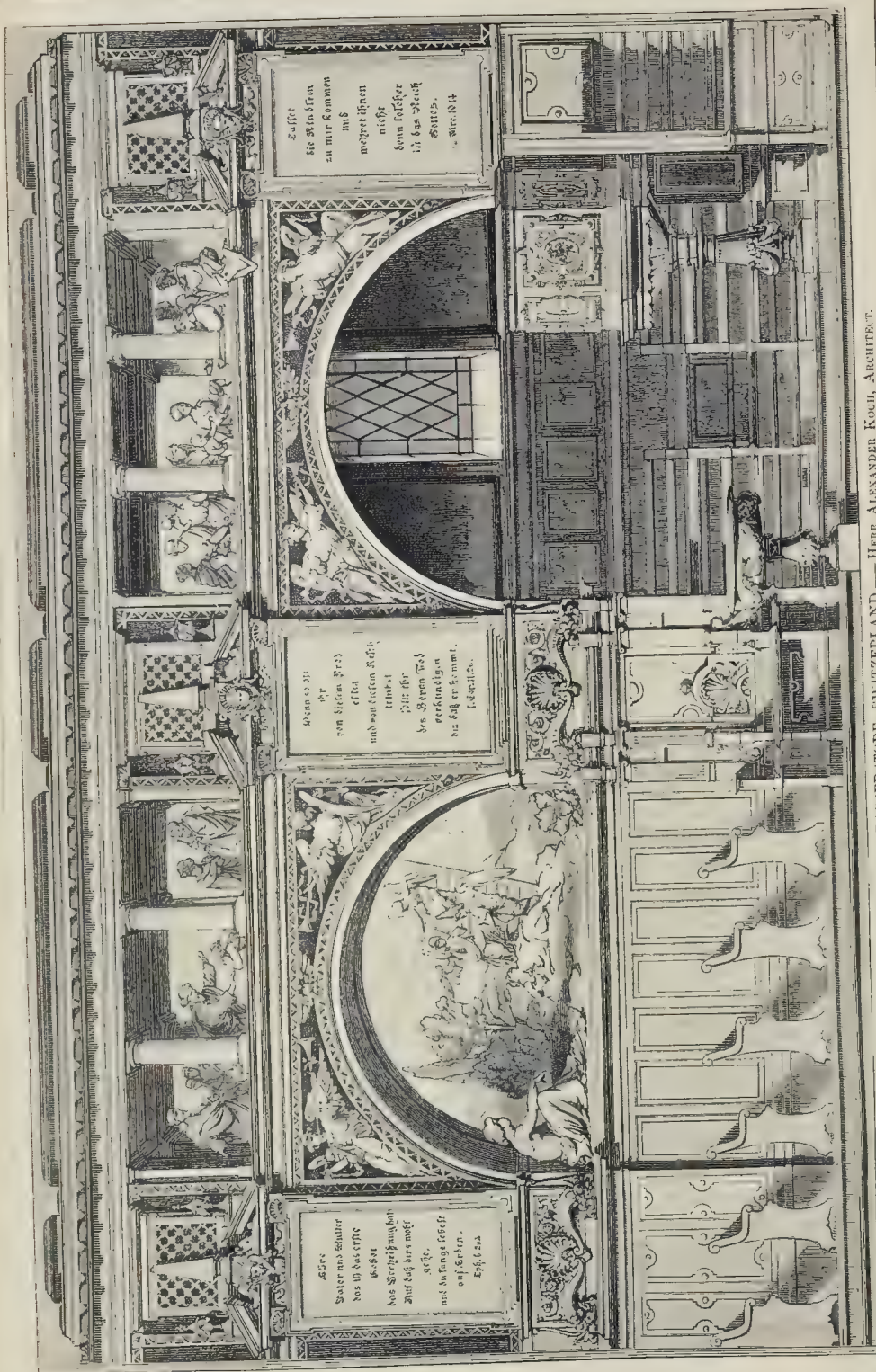
There will be 550 sittings provided. A house for an assistant pastor is attached, and beneath the church is a spacious assembly or reading room, adapted for use as a lecture hall.

Mr. John Shillitoe, of Upper Norwood, is the builder, and Mr. W. D. Carroë, M.A., the architect.

INTERIORS AT HOUSE, ENGLEFIELD GREEN.

THESE pretty and attractive sketches of interiors, in which picturesque effect is obtained without overstepping the reticence of style and decoration suited to an ordinary residence, are from a house built from the designs of Mr. R. W. Edis. We report elsewhere Mr. Edis's theory on the building of town houses, and have pleasure in illustrating at the same time his practice in the building of country houses.







THE BUILDER, MARCH 1, 1884.



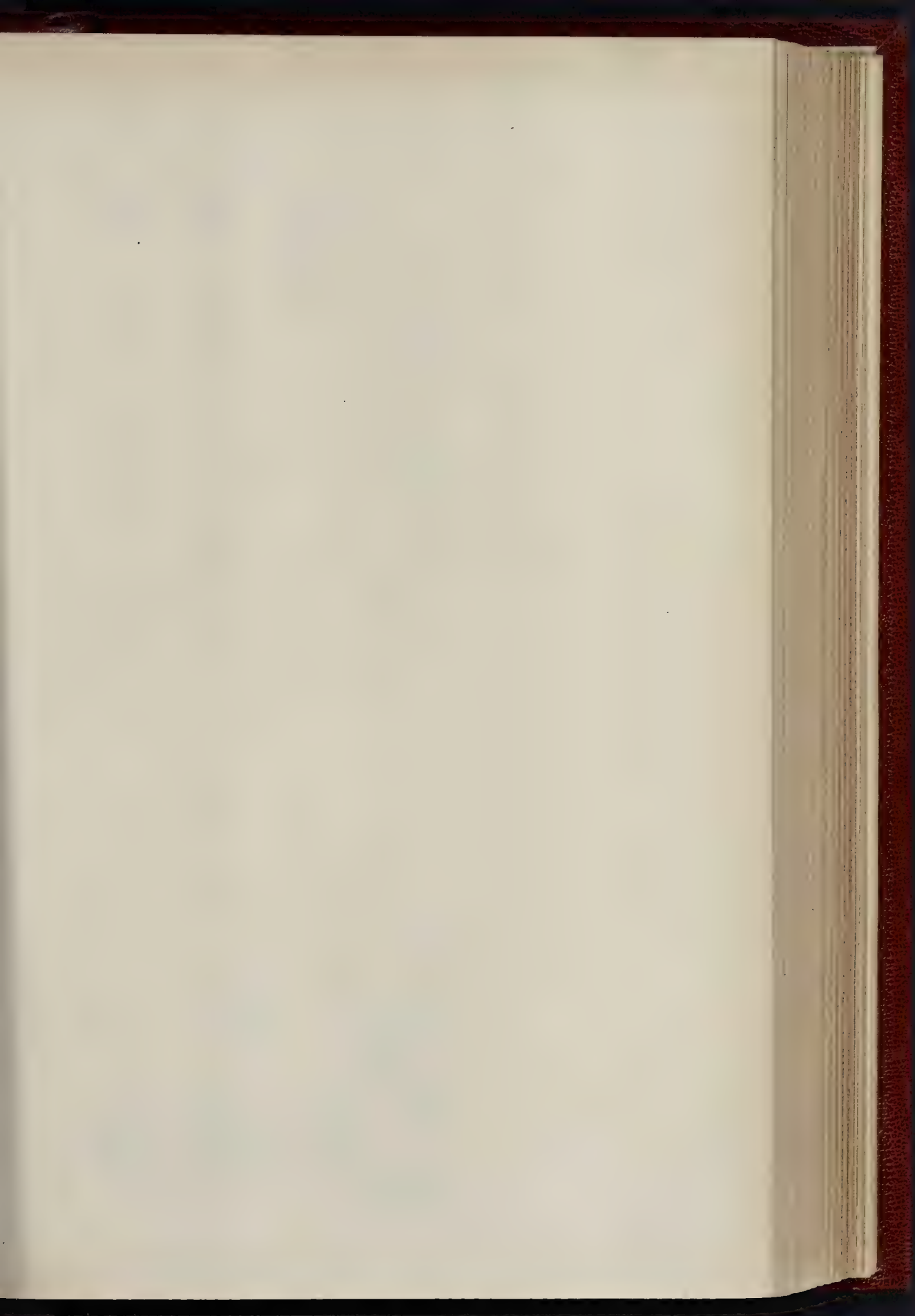
C. F. Kell Photo-Lith & Engraver

Printed by H. L. Lister

• South West View •

CHAPEL OF THE RED MOUNT, LYNN.

R.I.B.A.—Pugin Travelling Studentship, 1884.



THE BUILDER, MARCH 1, 1884.

New Residence. Chatsworth Square. Carlisle.

MR. G. D. OLIVER, A.R.J.B.A., ARCHITECT.

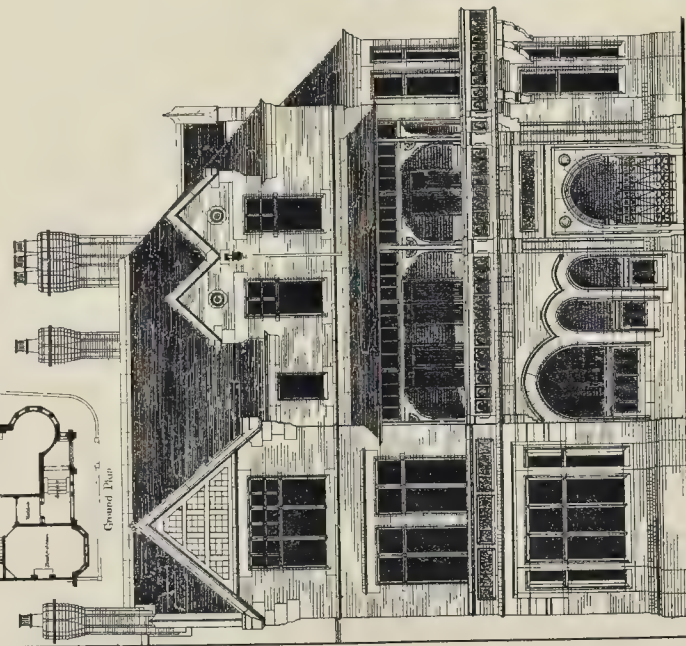
Scale of feet.



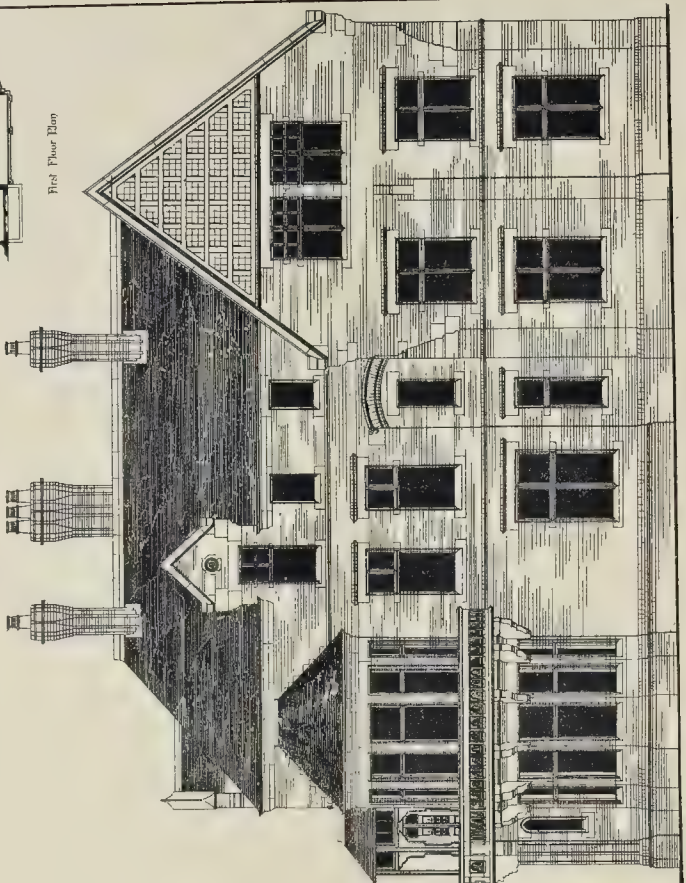
Ground Floor



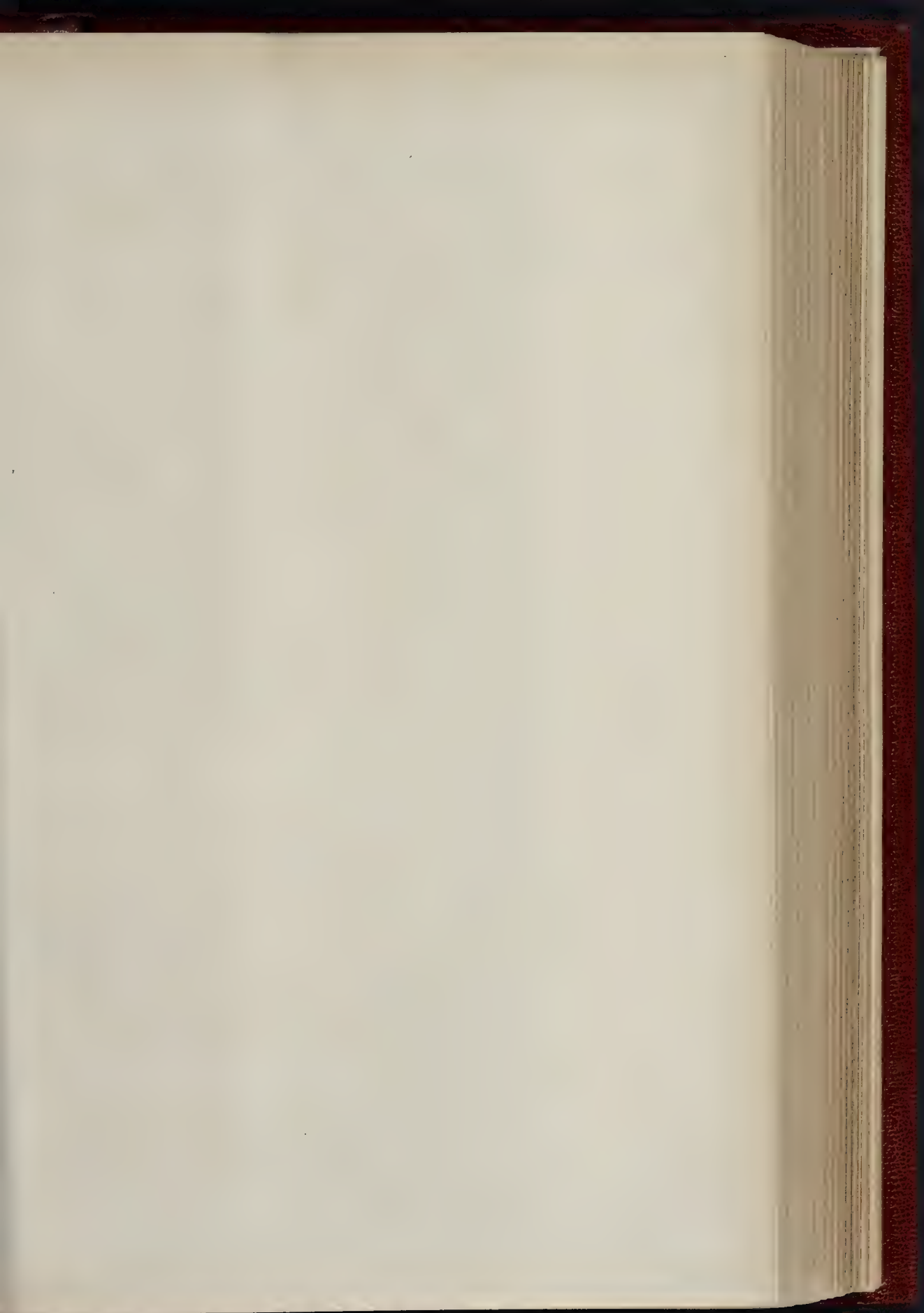
First Floor Plan



Front Elevation.



Side Elevation.



THE BUILDER, MARCH 1, 1884.

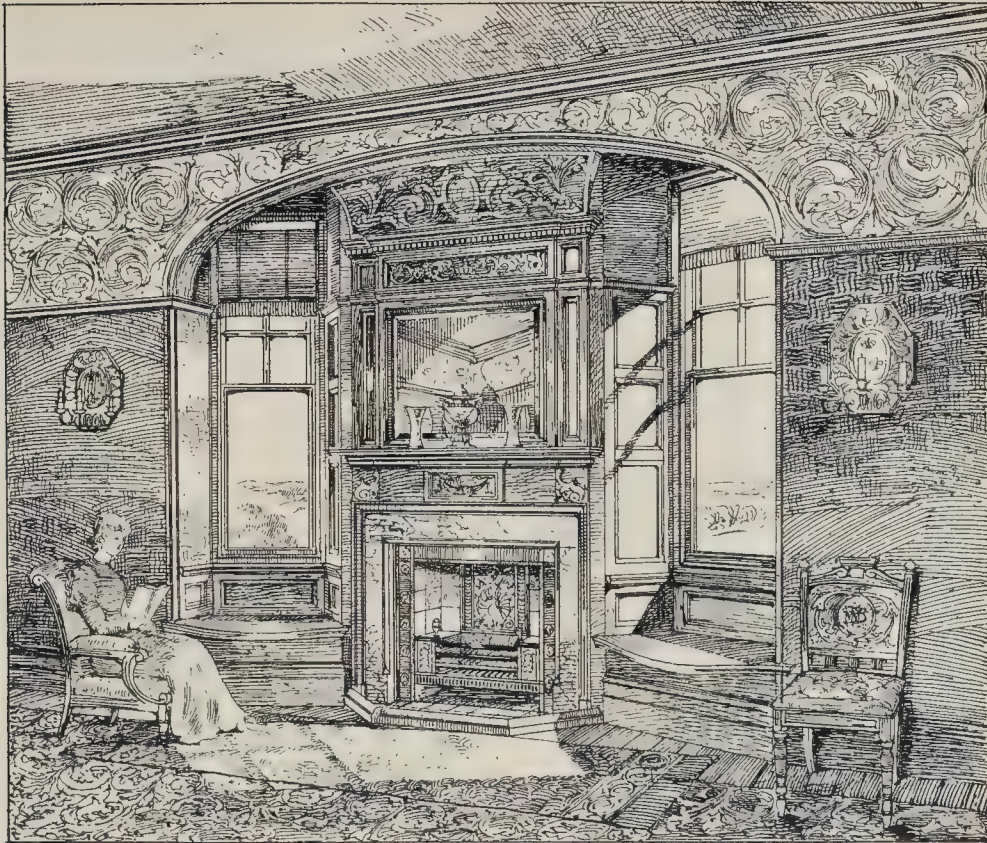




GUSTAF ABOLFS KYRKA
LIVERPOOL
W.D. CARROLL & CO. LONDON

New Scandinavian Church
Liverpool
Corner of
Barnes and
Barnes

W.D. CARROLL & CO. LONDON



INGLE-NOOK, DRAWING-ROOM OF HOUSE, ENGLEFIELD GREEN.—MR. ROBERT W. EDIS, F.S.A., ARCHITECT.



C. F. Kell, Photo Litho

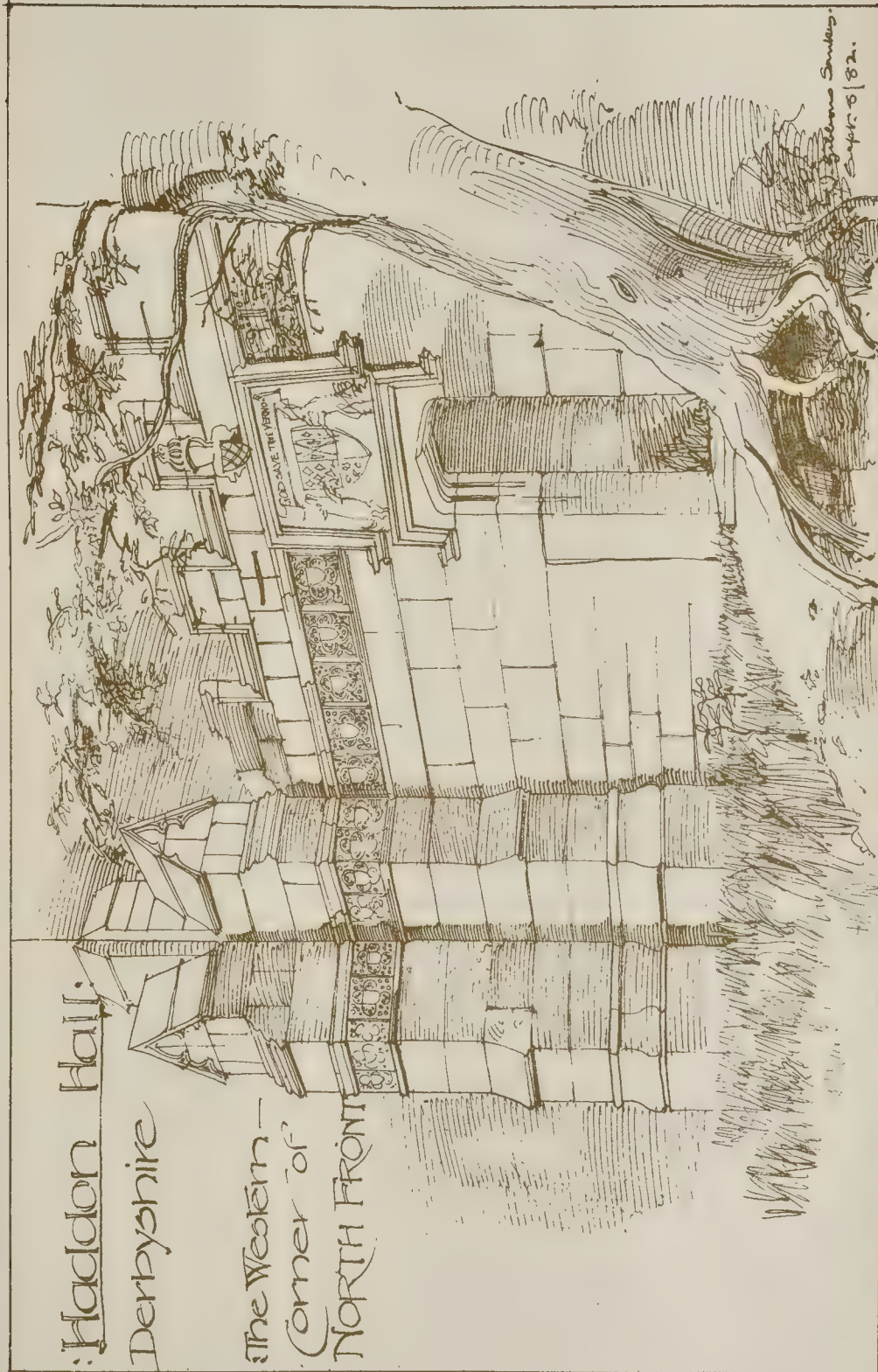
Wyman & Sons Printers

INTERIOR OF HALL OF HOUSE, ENGLEFIELD GREEN.—MR. ROBERT W. EDIS, F.S.A., ARCHITECT.

Haddon Hall.

Derbyshire

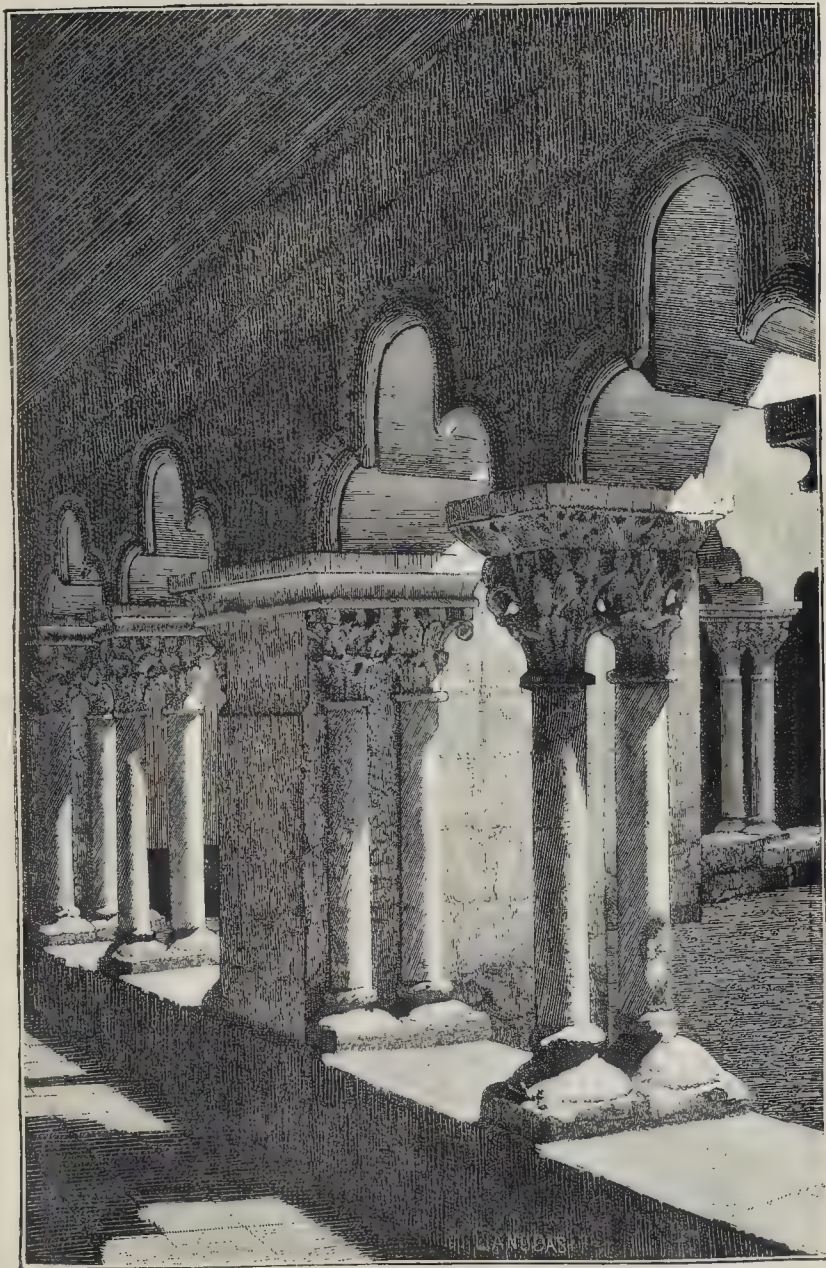
The Western—
Corner of
NORTH FRONT



R.I.B.A.—Pugin Travelling Studentship, 1884.

J. G. S. 1884.





CLOISTERS OF ST. PAU DEL CAMP, BARCELONA.

CLOISTERS OF ST. PAU DEL CAMP,
BARCELONA.

THESE cloisters form a very picturesque bit of work, interesting also in an historical sense, as displaying a mingling of Romanesque with Gothic feeling and style. The monastery dates a long way back; its first installation, as far as is known, having been in 914, the buildings

then erected having been destroyed in the invasion of Almansor in 986. In 1117 the church was rebuilt. The cloisters here shown are of somewhat later date, though the capitals, and more especially the abacns, retain details characteristic of Romanesque work; the foliage carving is just developing into Gothic. The heavy arches springing from these quasi-Romanesque piers are trefoiled, but through

the foreground arch a glimpse is caught of a cinque-foil arch on the other face of the cloister arcade.

M. Benjamin Ulmann, the painter, died two or three days ago, at the age of 54. Like Henner, his competitor for the Prix de Rome, he was an Alsatian.

ROYAL ACADEMY DRAWINGS.

The time for the annual collection of such drawings as the Royal Academy elect to hang in their architectural room is now approaching, the day for sending in drawings being, we believe, the 31st of this month. We shall be glad to receive before that time any drawings of a high class, or representing new buildings of importance, which their authors may wish to have illustrated in our pages during the continuance of the exhibition.

In the case of architects residing in the provinces, such drawings, if forwarded to our publishing office for the purpose of being photographed, will be duly delivered thence at the Royal Academy on the day of receiving, without further trouble to the author of the drawing.

MEDDLESOME CLIENTS.

Those who attempt to pass judgment upon a professional architect's work from an external stand-point are often in total ignorance of the unseen influences which have restricted him in giving expression to his ideas. Apart from enforced compliance with legal regulations, with the limits imposed by pecuniary considerations, or with conditions dictated by practical convenience, an architect is frequently obliged to sanction the whims and oddities of those who have not sufficient common sense to leave matters which they only half understand to the direction of their professional advisers.

It may seem presumptuous or out of place to censure those who might be supposed to have the best right to dictate in what manner their own money should be employed; but when that right is exercised, not only to the discredit of architects, but to the detriment of the interests of clients themselves, our protest will not be thought unreasonable. If persons having the command of capital were at times less dictatorial we should hear fewer complaints about the unsatisfactory state of modern architecture. Either in planning, in structural arrangement, or in external effect, a good design has often been marred through the short-sighted obstinacy of a meddlesome client.

How often is an architect, on inquiring with some asperity of the builder's representative why certain portions of the work have not been executed in accordance with his wishes, met by the reply that Mr. — has been down during the week, and reversed all his instructions? We could quote instances at length, but this is undesirable, and our readers could probably supply many from their own experience.

Those who make it their practice to decry modern architects and their works, upholding the handicraftsmen of the Middle Ages as patterns to be followed now, would do well to remember that the times are changed. In the Middle Ages, for the most part, the patrons of architecture, whose ideas found expression in stone, were men of taste and refinement. Often themselves loving students of the art, they were, in contrast to modern amateurs, careless of personal notoriety,—neither did they regard building in the light of a commercial speculation. They were content to devote their energies and resources simply to the production of noble works, and in this end they sought and found their sole reward. But now we have to cater for a large class of men who have expended the best part of their lives in the acquisition of money, who look upon the front elevation of a building as a species of advertisement hoarding, and upon all the devices of the artist as so many useful expedients for puffing their own wealth and importance.

Blunders and incongruities in architecture are, perhaps, more serious than those committed in any other art, because their effects are more enduring. Architects have, of course, to bear all the blame; but the architect, like the painter or the novelist, reflects in his work the tendencies of the age. In the future, the remedy for the present unsatisfactory state of things is, perhaps, to be sought in an increased interest on the part of the public, through education, in matters of art. In the meantime, let the client interfere less with his architect; let him pay the same deference to his professional opinion as he now pays to that of his medical or legal adviser, and then, perhaps, the architect may hope to vie with the wealthy and conceited amateur, who can afford to be his own client.

COLOURED GLASS.*

In my last lecture I treated of marble as being the most perfect of all opaque materials, because we can not only get refinement, lustre, and a wide range of colour, but we can construct with it, as the Romans and Italians did when they wanted strength as well as colour and polish.

We can scarcely call glass the most perfect transparent material, as it is but the imitation of a gem, though in point of translucent colour glass is probably equal to any gem.

I do not know that glass has ever been used structurally, though it might be. Nero built a temple of diaphanous marble, and we read of palaces built of gems in the "Arabian Nights."

It is, however, absurd to compare marble with coloured glass; for, though in the former you get lustre and dignified colour, in the latter you can get their apotheosis,—effects that outlive the rainbow and vie with the flame, that plunge you into ecstasies and ineffable bliss; effects so lovely and marvellous, that for a time they banish the thought that they can be the results of man's imperfect endeavours.

The Medieval founders,—who evidently felt the rapture of colour, and knew the fascination it had for the multitude,—made their churches and cathedrals mere picture-galleries to display this heavenly light.

Unfortunately for us, we mostly see these galleries without their pictures.

Although coloured glass is not architecture, I did not think it, out of place to speak of it, as I not only hope you will hereafter have to build for it, but it has the making or marring of a building in its power; in fact, I may say more, if the coloured glass is of the finest quality, it will, like charity, cover a multitude of sins.

I propose to give you a short account of what is known of the origin and history of glass, a substance that has added so much to our comfort, refinement, pleasure, and delight, to offer you my opinion on the merits of the different styles of coloured, stained, and enamelled glass, to drop some hints on its proper employment in buildings, and to say something about its future prospects.

How glass was discovered is hidden in prehistoric darkness, for the chemist tells us that we may dismiss as fabulous Pliny's well-known story of how it was first made in the open air; but as tradition has so hallowed the story that no treatise on glass is without it, I will repeat it. Some merchants had moored their vessels on the seashore, by the mouth of the River Belus, and supported their cooking-pots with some of the blocks of cubic nitre with which their vessels were laden; the fires melted the sand and soda, and glass was the result.

A more probable account is given by Josephus, who tells us that the art of making glass was discovered by some Jews, who set fire to a wood on a mountain, that the heat melted the sand and caused it to run down the mountain. We have all heard of lumps of dark glass being found amongst the ashes of burned haystacks, and in large fires I have seen the face of brickwork fused, so that dark green tears had run down it. After the burning of the Armoury at the Tower, the gun-flints were found partially fused into masses, and covered with a green glass-like glaze. As it would have been too expensive to burn down a forest every time glass was wanted, we may rather suppose that the constituents and qualities of glass became known in the prehistoric furnaces where metals were smelted and new fuses tried.

Glass was not only known to the ancient Egyptians, but they became most skilful workers in it, and have left most beautiful objects in party-coloured glass. They left representations of glass bottles with wine in them 2,000 years before our era. The Greeks knew glass; they could scarcely fail to do so when they had such intercourse with Egypt, although it is not mentioned in Homer.

Herodotus, who died about 408 B.C., speaks of the columns he saw in the Temple of Heracles at Tyre, each of which was cut out of a single emerald, and at night threw out a marvellous light. They were probably of hollow green glass into which the priests had put lamps. We know that the Santo Catino, or holy grail, now at Genoa (an engraved plate of green glass), was, for many centuries, believed to be an emerald.

* From a lecture by Mr. G. Aitchison, A.R.A., delivered at the Royal Academy on Monday, the 25th ult.

Glass cups are spoken of in the "Acharnians":—"We drink against our wills from cups of glass and golden chalices"; and the "burning glass" is mentioned in "The Clouds." Aristophanes died B.C. 380. Glass was also known to the Assyrians, and probably to the Chinese, for Pliny's description of the glass of India made out of broken crystal corresponds to a Chinese method of making glass, and they imported it into India for enamels.

In our version of the Old Testament, glass is not mentioned; but Michaelis, writing in 1754, says the word "crystal" in Job xxviii. 17, is "Zechucketh," which all learned Rabbis before Christ translated as glass. The date of Job is said to be 1520 B.C.

It is needless to say that the Romans used glass, for, to every boy who has learned Latin, "O Fons Bandusian, splendidior vitro" is familiar. Horace died in the year 8 B.C., aged 58, and Vitruvius, who was born about 80 B.C., speaks of glass, called *vitæ* by the Greeks. About the date of our era glass mosaic was used to decorate vaults, ceilings, and other portions of buildings at Rome and in the Roman Empire.

Pliny tells us that Sulla's son-in-law, M. Scaurus, "During his sedulship, and only for the temporary purposes of a few days, executed the greatest work that has ever been made by the hands of man, even when intended to be of everlasting duration; his theatre, I mean. This building consisted of three stories, supported upon 360 columns. . . . The ground-story was of marble; the second of glass, a species of luxury which ever since that time has been quite unheard of, and the highest of gilded wood" (Lib. xxxvi., cap. 24).

It is curious that Pliny gives us no hint of how this glass was used, whether structurally, as windows, or as wall ornaments; but it is believed that slabs of opaque glass were used in this theatre as wall linings. At any rate, opaque glass slabs came into vogue for that purpose later, and were even used as paving in the shape of tiles and amongst marble mosaic.

He also says:—"There is an artificial obsidian stone [obsidian], made of coloured glass for services for the table; and there is also a glass that is red all through, and opaque, known as 'hematinitum.' A dead white glass, too, is made, as also other kinds, in imitation of murrine colour, hyacinthine, sapphire, and every other tint; indeed, there is no material of a more pliable nature than this, or better suited for colouring." (Lib. xxxvi., cap. 67).

That the Romans brought to it such perfection need hardly surprise us when we know that in the time of Nero 50,000, was paid for a pair of cups.

As far as I can find out, no one has as yet been sufficiently interested in coloured glass windows to dig out the accounts of their first introduction from the writers of antiquity or of the Dark Ages. We learn from Pliny that almost any colour could be given to glass, and, in his description of gems, he says, speaking of the opal, that "There is no stone that is imitated by fraudulent dealers with more exactness than this, in glass." [Lib. xxxvii., cap. 22.] If the Romans set their gems transparently in rings this might have suggested stained glass or the casual holding up of pieces of coloured glass for mosaic on any perforated material.

Pliny uses a strong argument to prove that glass mosaic was not known in B.C. 27, when Agrippa built the Pantheon, and other glass must have taken a rapid stride between that time and Pliny's death in A.D. 79, or else glass mosaic must have been introduced from some country where this mode of decoration was practised, for we find glass mosaic used in fountains at Pompeii.

Mr. Nisbett, quoting from the Chronicles of the Singhalese Kings, about B.C. 386, says, "Windows, with ornaments like jewels, which were as bright as eyes." This may mean stained-glass windows, but it may not.

We know from Pliny that talc and various sorts of translucent substances were used for windows, and traces of talc have been found in the rabbets of the windows at Sta. Prassede, at Rome. I give you Martial's epigram on the subject of windows and conservatories:—

"Your oranges and myrtles, with what cost,
You guard against the nipping winds and frost!
The absent sun the constant stoves repair:
Windows admit his beams without the air."

* Oh, Bandusian Fountain! more brilliant than glass.

Mr garret, too, hath windows, but not gl'asses,
Where Boreas never stays, but often passes.
P. r shame! to let an old acquaintance freeze!
I had much better live amongst your trees!"
Lib. viii. s. 14 (Har).

But we have ocular proof that uncoloured glass was used in Pliny's time for windows: the pane of glass found in a bronze frame in the house of the Faun at Pompeii; the large square in the bath, 3 ft. 8 in. by 2 ft. 8 in.; a window described by Sir W. Gell as containing four panes divided by cruciform bars of copper, fastened with nuts and screws to remove the glass; and in a Roman two-storied villa on the Herculaneum road a large glazed bow-window was found. The glass was very thick and greenish, and set in lead like a modern casement. Prudentius, 337 A.D., says of St. Paul beyond the walls of Rome:—"In the windows are displayed glass of varied colours as brilliant as the fields of flowers in spring."

And in 398 St. Chrysostom praises the high glass windows of various colours. It is believed that Justinian, who built St. Sophia in 532 A.D., ornamented it with coloured windows of cast glass.

I am loth to quote from the "Arabian Nights," because it is supposed to have taken its present form in the sixteenth century, though some of its stories are as old as Homer; but in the City of Brass, a story supposed to be of the time of the Caliph Abd-El-Melik, the son of Marwan, who reigned from A.D. 685 to 705, there is this passage, which may refer to glass:—"Around which were lattice-windows, decorated and adorned with oblong emeralds, such as none of the kings could procure" (Lane's Translation of "1,001 Nights," vol. iii. p. 134).

Mr. Hendrie, the English translator of Theophilus, informs us that "Fortunatus of Poitiers in the sixth century praises the bishops who ornamented their churches with stained-glass windows;* and Eracius, of the eighth, ninth, or early part of the tenth century, gives directions for making coloured glass; there is also a MS. given by Muratori, and said to be of the eighth century, where directions are given for making it. Theophilus, of the eleventh century, or, as Viollet-le-Duc thinks, of the twelfth century, in his essay "Upon Various Arts," gives directions for making and painting coloured glass, and was evidently well versed in the art of enamelling it. Unfortunately his recipes for coloured glass have been lost, although from the index to his MSS. he must have given them. Yellow and purple glass he speaks of, but only as found accidentally when white glass was being made; but he speaks of blue, white, red, green, and all kinds of colours, and gives the receipt for making gold mosaic; he also tells us that the opaque glass of the Pagan mosaics was used as gems, and says, "Divers small vases are also found, of the same colors, which the French, most intelligent in this work, collect, and some melt the sapphire in their furnaces, adding to it a little clear and white glass, and make costly plates of sapphire, very useful in windows." (Lib. 2, cap. 12.) In his recipe for white glass he tells us it was made with washed sand, and the ashes of dried beechwood.

In a MS. on the subject (Sloane Collection, No. 3,661), the following notice is found: "This book pertayneth to me John Elyot, which was written out of an old copye (xxx.) in Anno 1672: which copye seemeth to be above 200 years old." In it is given the recipes for making blue, violet, emerald, bolass-ruby, ruby, carbuncle, sapphire, hyacinth (reddish brown or blood red), topaz (yellow, saffron yellow, brownish yellow, and reddish pink), garnet, chrysolite (olive green), turquoise, and carnelian glass; the blue owes its colour to cobalt, the violet to manganese, the emerald to copper, bolass-ruby and ruby to copper and iron, to gold for the carbuncle, to lapis lazuli for sapphire, to gold and iron for hyacinth, to gold and lead for topaz, to gold and hematite for garnet, to zinc for chrysolite, to gold and lapis lazuli for turquoise, to tin, mercury, and golden marcasite (iron pyrites) for carnelian.

Coloured glass windows may be divided into two grand divisions, the eastern and the western; the eastern formed by the insertion of thin unshaded coloured glass in, or on to patterns cut in stone, marble, plaster, or wood; and the western where the glass is fitted into leaden frames and shaded, although I believe the clear glass roundels of the lower windows in Eastern

houses are set in lead, both methods having been used in Rome.

In Oriental work the wide chamfered bars of plaster forming the pattern not only act as a dark separation confining the radiation to their own chamfers, but when seen at a proper angle the effect of shading is produced. One bright jewelled spot of the pure glass is seen, and the remainder of the colour is but the reflection on the chamfer. The ground is formed in this wise: the plaster is thinned and pierced with round holes, which are glazed with one colour, though often modified in tone and tint; from the small size of the holes the radiation would be more confined, yet the light reduces this large area of blank space to a fine network. Although I have never seen it done, I should think this mode of glazing might even be adapted to figures. Of course, in Mussulman countries figures are inadmissible. I believe no complete coloured glass window in the West is older than the twelfth century, though some of the tenth and eleventh centuries are spoken of.

It seems a contradiction to speak of grisaille windows under coloured glass, but in old glass the grisaille was not white, but of varied light tones, such as sea-green, pale blue, fawn, pink, pale brown, and such pale tints, and the glass was more like onyx, agate, or alabaster than like clear glass. The Cistercians eschewed colour, but tried to make amends for its absence by the choice of rich patterns in the lead-work. In many cases the early grisailles are almost equal in beauty to the finest coloured glass.

I once had a glimpse of the grisaille windows in the cathedral at Poitiers towards dusk, and the impression of the soft and varied loveliness of their purely hues impressed me only a degree or two less than did the windows of Florence or Chartres.

When grisaille is made of pure white glass, even if it be ground, or rough and full of bubbles, nothing more rapid can be imagined, and the introduction of one such window amongst coloured ones utterly spoils their effect in a building.

Even when the glass was of the thickest and best quality, and was greatly varied in tint and tone, it was found advisable to insert coloured bands and jewels, so as to lead the eye to the coloured windows, and to prevent a sudden break of continuity, but there was a general inclination to mingle coloured subjects with jewelled grisaille, or to alternate it with them.

We hear from Theophilus that he had seen, admired, and tried to imitate the coloured glass windows of Sta. Sophia, and we may well believe, from what we know of the mosaics at St. Vitale, St. Apollinari, and the tomb of Galla Placidia, that these stained-glass windows were not less lovely in colour, and that the laws of harmony were as fully understood.

To whatever cause we may attribute it, the fact remains that the glass of the twelfth and early part of the thirteenth centuries is the most splendid that yet remains to us; the gorgeous colour indulged in by the Romans at Byzantium had no doubt its effect, for that was the centre from which all the arts had flowed. The Roman emperors found the mosaic for the mosque at Damascus as well as for the Kaabeh at Cordova, they found the architect for St. Mark's, and we hardly know when Byzantine influence was absolutely at an end before the final extinction of the Roman Empire in 1453, by Mahomet II.

The splendour, too, of the Court of the Caliphs must have had its influence on mankind, and doubtless the magnificent stuffs and tapestries made for it, found their way into Europe, even if it were only in the shape of presents. The account of the presentation of the Ambassador of Constantine IX. to the Caliph-el-Muktedir, A.D. 917, gives us some notion of the wealth and display then existing at Bagdad; and about this time Arab art and learning began to affect the West, though the forms in these twelfth and thirteenth century windows are still mainly Byzantine.

The glaziers' art was then, too, at its zenith, and it is also possible that at this time the colour sense was exceptionally developed.

We know that Theophilus was a monk, and he apparently wrote his treatise for another monk. If he lived in the twelfth century his being a monk may account for some of the excellence of the work, but whether the windows were done by monks or laymen, the same qualities would, and will produce, similar effects, when the natural gifts exist and grand oppor-

unities for their exercise; I mean a strong desire for the perfection of the art (for the art's sake alone, apart from all selfish considerations), combined with acute observation, untrifling industry, and patience.

The twelfth and thirteenth century windows were of the deepest and richest colours, the ground generally being of crimson and azure, and only rarely of emerald, the figures and objects in the pictures were paler in tone than the grounds, often strikingly original in their harmonies, and between the pictures there was a fully coloured diaper, and white was used as a jewel so precious, indeed, that the narrow strips were often painted to form strings of pearls.

In the aisles of churches patterned windows were generally adopted,—I mean by this a window formed into a pattern with the circles, oblongs, or cusped spaces filled in with figure-subjects,—and in the clearstories gigantic figures. If you stand in the round part of the Temple Church you will observe the beauty of the east windows, and particularly the marvellous effect of the main forms of the patterns; but it is in the nave of Chartres that we find patterned windows that exceed in magical beauty any other manifestation of colour that man's hand has achieved. Some notion of their beauty may be got from those at Canterbury. I was unfortunately unable to get some tracings of these done in time.

When we look at Titian's "Entombment," Bonifacio's "Finding of Moses," or some of the sketches of Schiavone or Paul Veronese, we think it impossible to find greater beauty of colour; but these masterpieces, as far as their colour goes, leave us comparatively emotionless when put in the scale with these windows of Chartres. We say what genies these men were; but when we look at the windows it seems as if some divinity had melted every lovely jewel and every tone of mother-of-pearl, and poured out a cascade of coloured glory that flames, sparkles, and throbs, that raises us to ecstasies, and makes us thankful that the tempter of mankind is not there to offer us the power of making such for his usual fee, and we ask ourselves if they were really made by men and not sent down to us direct from heaven, to give us a taste of its delights. We have the apotheosis of colour, and though, on close inspection, we may find the composition ludicrous, and the drawing childish, though the saints have purple or green hair, we are no more disturbed by that, than a musical device when he hears the most exquisite song sung by a woman with the loveliest and most cultivated voice because she is singing nonsense in an unknown tongue.

After this apogee of the glazier's art two or three causes combined to drag it down; it is undoubtedly the case that this full and rich toned glass did produce, not merely "a dim religious light," but almost gloom, and this rich-coloured glass was probably very dear, the want of funds and of cheerfulness probably combining to urge the introduction of white glass.*

ARCHITECTURAL ASSOCIATION.

VISIT TO THE ALBERT EXHIBITION PALACE, BATTERSEA.

THE third Saturday afternoon visit this session of the members of this Association took place on the 23rd ult. to the building now known as the Albert Exhibition Palace, Battersea Park.

The members were received by Mr. Moore (a member of the firm of Messrs. F. Braby & Co.) and Mr. Hand (chief superintendent of the firm), who explained the drawings and the chief features of the structure.

The history of this building dates back as far as June, 1862, when designs were advertised for the erection of the Dublin Exhibition Palace and Winter Garden, to be erected in Dublin.† In reply to this advertisement twenty-four competitors sent in designs, and from these the drawings of Mr. A. G. Jones, architect, of Dublin, were selected. A description and illustration of this design appeared in the *Builder* of January 31st, 1863. The illustration represented the design as selected by the Committee, but it was greatly altered in execution to reduce the cost. The services of Messrs. Ordish & Le Feuvre, of London, were called in to assist in the construction of the building. This having

* An essay upon various arts, in three books, by Theophilus, called also Regulus, priest and monk, forming an encyclopædia of Christian art of the eleventh century—translated, with notes, by Robert Hendrie, 1847.

* The remainder in our next.

† See *Builder*, vol. xx., p. 499.

been completed, it was publicly opened by H.R.H. the Prince of Wales, May 9th, 1865. A very minute and detailed description of the roof and other ironwork construction appeared in our former contemporary, the *Civil Engineer and Architect's Journal*, for April, 1866, together with an excellent illustration of the section through the nave and side aisles, by J. Jobbins. This description is interesting now, the section of the building at Battersea being an exact reproduction of the one at Dublin, which, having served its purpose, and stood for eighteen years, it was last year resolved to take it down and re-erect it at Battersea. For this purpose a company was formed, called the Albert Exhibition Palace Company, Limited; and a contract was entered into with Messrs. F. Braby & Co., the zinc roofing manufacturers and contractors, of Fitzroy Works, Euston-road, to take the building down and re-erect it at Battersea Park. In taking the old building down great care had to be used,—every girder, column, purlin, and other piece had to be numbered,—and so carefully was the work performed that not a ton of ironwork was destroyed in taking down the structure preparatory to its transmission to London; but we are sorry to learn that a good deal of the ironwork was broken in transit, which caused great delay in getting the broken pieces recast sufficiently accurately to fit their proper places. These difficulties being ultimately overcome, and the various details of the ironwork deposited on the new site in a somewhat heterogeneous manner, it became a sort of gigantic Chinese puzzle to re-adjust them for erection. The site is a long strip of land just outside Battersea Park, and the work of taking down and re-erecting the structure has been performed by Messrs. Braby & Co., in the very short space of six months, under the superintendence of Mr. Hand (their representative) and Mr. Fuller, Clerk of Works. The necessary stone and brickwork to the structure has been executed by Messrs. Bywaters. The whole of the works have been executed or carried out under the direction of Mr. Bell, C.E. (of Messrs. Bell, Miller, & Bell).

The superficial area of the plan is the same as the former building at Dublin, but the shape is somewhat different, that at Dublin being in the form of a recumbent letter Γ , whereas the one at Battersea is in the shape of a Π -square. This was done to suit the difference of sites. The present building may, therefore, be said to consist of nave and transept, it being contemplated to construct another corresponding nave on the left of the transept, so as to make the transept a central one if the building should turn out a success. The nave and aisles are 460 ft. long (divided into bays of 16 ft. 10½ in. each) by 84 ft. wide. The transept is of the same span, viz. 50 ft., but has a double row of aisles on either side, making its total width 120 ft., or the entire length of the building 580 ft. Its height up to the apex of roof is 60 ft. The transept, like the nave, is also divided by iron columns and lattice girders into bays of the same dimensions; the iron columns acting also as rainwater down-pipes. The roof is covered with Braby's Italian zinc roofing and tinted glass. The whole of the glass, tinted and otherwise, and glazing, are supplied and executed by Messrs. Russell & Gibbs. We may here mention that Messrs. Braby's system of laying zincwork dispenses entirely with the use of solder, and provides for the expansion and contraction of the metal. Some specimens of the old zinc from Dublin used in 1865 were shown to be in almost as good state of preservation as when first used. Some models also of Messrs. Braby's system of roofing and glazing were exhibited to the members: absence of solder in the one and absence of putty in the other being the chief characteristics. In the glazing, for instance, the glass was simply bedded on the lengths of creosoted cord, and screwed down through rolls of No. 16 zinc.

An addition has been made to this building as an annex, the full length of the nave (460 feet) being a substantial building of brickwork, faced on the outside with Portland stone; the roof supported by light ornamental iron principals. The ground-floor is to be divided into various offices. The first-floor to be used as a picture-gallery and dining-room. The contract for this portion of the work has been undertaken by Messrs. Bywaters, under the superintendence of Mr. Bell, C.E. It is intended to open this building to the public in May next.

NEW CEMETERY, WEST DERBY, LIVERPOOL.

A new cemetery for the parish of West Derby, Liverpool, has been recently opened. The land purchased by the Board consists of about 180 acres, of which, for the present, only 60 acres are laid out, the rest being meanwhile used for agricultural purposes. Mr. Wortley, of Liverpool, laid out the estate, apportioning 80 acres to the Church of England, 19 to the Roman Catholics, and 9 to the Nonconformists, a small portion of the 60 acres remaining unappropriated. The building and front boundary-wall were designed by and carried out under the superintendence of Mr. F. Bartram Payton, whose designs were chosen in a public competition. The portion of the ground which is now laid out has a frontage of about 1,700 ft., along which a new stone wall is built in bays, with ashlar piers, quoins, and coping, and ornamental iron railing. The other boundaries consist of plain iron fences. The entrance to the grounds is at the south-west corner, and consists of two pairs of carriage-gates, and two foot-gates, with five ashlar piers, the central and largest having pedestals for statuary standing in arched niches, and terminating with a spire and pinnacles. At the entrance is a drinking-fountain, with red granite basins.

The Registrar's house and offices form one group of buildings, and stand near the gates, the former containing two sitting-rooms, kitchen, scullery, six bedrooms, bath-room, &c., and the latter a large office, with fireproof room, waiting-room, Board-room (with open timber roof) on the first floor, monument-room, &c. A tower, rising to a height of about 90 ft., marks the entrance to the offices, and has a clock with four dials and a bell; this tower also contains a cistern, whence all the buildings are supplied with water. On the other side of the entrance a lodge for the superintendent is in course of erection.

Of the three chapels, the central one is assigned to the Church of England, and has sitting accommodation for about 250 persons, the nave being 60 ft. by 28 ft., with mortuary aisles separated therefrom by handsome screens, glazed with plate glass; chancel, and tower and spire 110 ft. high. The Nonconformists' chapel seats about 200 persons, in a nave 60 ft. by 24 ft., with mortuary aisle, chancel, tower, and spire 97 ft. high. The Roman Catholic chapel accommodates an equal number, in a nave 51 ft. by 28 ft., and has an apsidal chancel and tower and spire of the same height as the Nonconformists' chapel. Each chapel has attached to it a waiting-room, with lavatory, &c.; a vestry for the clergy, with lavatory, &c.; an organ chamber; and a tool-house, with public conveniences. They are all heated with hot water on the high-pressure system, and are admirably finished inside with red pressed bricks, relieved with black and white bricks, tuck-pointed, and Bath stone dressings. The seats are of pitch pine. The external walls are faced with Bradford wallstones, and the external ashlar is all from the same district. The buildings have been described as a small epitome of the various phases of the Gothic style of architecture, in which the Episcopal chapel represents the Early English, the Nonconformists' chapel the Decorated, and the Roman Catholic chapel the Perpendicular periods. The total cost of the cemetery is estimated at 73,000*l.*, of which about 17,000*l.* will have been spent on the buildings.

Mr. Jon. Mattack, of Keighley, was the contractor, and executed the mason's and bricklayer's works; the joiner's work was sublet to Messrs. A. & J. A. Clapham, the plumber's work to Mr. C. Nelson, the slater's work to Mr. T. Nelson (all of Bradford), the plasterer's work to Messrs. Emmett (of Keighley), and the painter's work to Mr. E. W. Walker (of Idle); Messrs. Welsman, of Bradford, did the quarry glazing; Mr. Fell, of Liverpool, the internal pointing to brickwork; Messrs. Freeman & Collier, of Manchester, supplied the iron railings, gates, hinges, and lightning-conductors; Mr. W. E. Clark, of Liverpool, did the carving; Messrs. Potts & Sons, of Leeds, supplied the clock and bell; Mr. William Truswell, of Sheffield, made the heating apparatus; Messrs. Bennett Bros., of Liverpool, supplied the grates, ranges, &c.; and Messrs. Milner & Co. the fire and thief-proof doors to safes; Messrs. Kaye & Co., of Leeds, made and fixed the locks. Mr. David Evans acted as clerk of works.

GALVANISED IRON WATER PIPES.

DR. VON EHMANN, one of the principal technical authorities on the subject in Wurttemberg, has communicated to the *Deutsche Bauzeitung* various details as to the employment and preservation of galvanised wrought-iron pipes for the purpose of conveying water. For many years the use of these pipes has been general in Wurttemberg for conveying water from the cast-iron main pipes in the streets to the taps, &c., in private or public edifices. Before use the pipes are carefully tested for the suitable pressure of water, and also with a view to greater security for a still higher pressure (usually up to twelve or fifteen atmospheres). For branch pipes the use of any other metal is prohibited in most parts of Wurttemberg, so far as pipes of ½ inch to 1½ inch internal diameter are concerned. The regulations in force also define the thickness of the pipes, which should be fully one-sixth of an inch for one inch internal diameter. The galvanising is on both sides, and the pipes are not allowed to be used until the official tests as to the pressure of the water have been held.

The results of this system would seem to have been satisfactory as to the soundness of the pipes and their preservation. Thus it is recorded that after having been for several decades in use, pipes which were examined were found perfectly good and almost totally free from either internal or external incrustations. An exception, however, is made as to those situations in which the pipes have been exposed to influences of a character specially affecting their durability.

This would seem to be specially the case in large stables, chemical factories, &c., where solutions of nitric acid, ammonia, &c., would come into immediate contact with the pipes. In such cases it is thought advisable to use iron pipes (whether galvanised or not) as little as possible. The pipes of the description referred to by Dr. Ehmman are also said to have been objected to in various quarters, in the same manner as other kinds of pipes have been treated from time to time. The experience of their use is considered, however, to have refuted in a satisfactory manner any assertions of a prejudicial character.

"SOME NINETEENTH CENTURY ARCHITECTS."

THIS was the subject of a lecture delivered the rooms of the Leeds and Yorkshire Architectural Society on a Monday evening last by Professor T. Roger Smith. Reference was first made to the three leading architects of twenty years ago, namely Cockerell, Pugin,—who did probably more than any other man to promote what had been termed the Gothic movement,—and Sir Charles Barry, who, said the lecturer, ought to be ranked as the foremost architect at least in Great Britain, and possibly, in Europe, of the present century. Some architects of less prominence who lived about the same time having been noticed, the lecturer referred to Owen Jones, whom the 1851 Exhibition made famous as a decorator, and who held for many years a prominent position in connexion with the artistic use of colour; Cuthbert Brodrick, well known in Leeds as the architect of the noble Town Hall; Edward Walters, who built the Free Trade Hall in Manchester; Thomson, of Glasgow, who devoted himself to adapting Greek architecture to modern purposes; and F. P. Cockerell, whose personal qualities, as well as his professional work, were referred to in high terms; and Edward M. Barry, a son of Sir Charles Barry, was the last of a series which included chiefly the architects who had practised Renaissance design. After alluding to the group of men who, by their antiquarian researches, extended and almost perfected the knowledge of the Mediæval architecture of Great Britain, the lecturer concluded by some account of the three most prominent architects of the Gothic revival,—Scott, Street, and Burgess. Sir George Gilbert Scott was described as a man of immense application and perseverance, and as having the most intimate acquaintance with the architecture of England, down to the peculiarities of individual churches. His largeness of knowledge, his experience, and his great reputation, rendered him perhaps the fittest man to deal with the difficulties met with in restoring our cathedrals and abbey churches, a

very large proportion of which were put into his hands. These restorations were Scott's most important work, but a large number of new buildings, secular and ecclesiastical, were erected from his designs. A sketch of Scott's lectures at the Royal Academy, his competitive drawings for the law courts, and a few of his more prominent works, followed, which was closed by a reference to the great literary merits of his volumes of lectures and his Memorials of Westminster Abbey. George Edmund Street owed his early opportunities to the friendship of Bishop Wilberforce, but he became well-known both by his buildings and the wonderful pen-and-ink drawings from his own hand which he exhibited year after year at the Royal Academy. His smaller churches and his plain buildings, where only very little ornament was possible, were pointed out as possessing peculiar excellence. He was a man of great energy and self-reliance, and used to outline in pencil all the drawings for every building he superintended. Turning to the new Law Courts in connexion with which Street's name was best known, the Professor declined to attempt to pass a critical opinion upon the building, but pointed out in relation to it that the Commission, not the architect, was largely responsible for the general scheme; and that the building had been crowded on too small a site, circumstances to which the greater part of the complaints of inconvenience sometimes made were traceable. He pointed out the dignity of the unrivalled vaulted hall, the like of which does not exist in Europe, and the beauty and variety of the architectural features throughout the building, directing special attention to the great *friche* over the roof of the main hall, and to the variety and beauty of the vaulting. The lecturer described William Burges as one of the greatest artists and best antiquaries whom the Gothic revival produced. He knew probably as much of Mediæval archeology as any Englishman of his day, and acquired a thorough familiarity with every art or appliance that could contribute to the excellence of a building. Burges's success in the international competition for a cathedral at Lille, in France, and his principal works of architecture and decoration, were referred to. In conclusion, Professor Smith said he hoped the memory of such examples would help to make his hearers proud of the profession to which many of them belonged.

DISCOVERY OF CLASSICAL REMAINS AT NISMES.

WE learn that at a recent meeting of the Historical and Archeological Society of Geneva, Mons. C. Dardier, of Nismes, gave a description of a handsome mosaic discovered in the latter city at a depth of 180 metres, in the course of the excavations necessary to form the new streets near the Central Hall. The discovery was made on the 20th of December last.

The dimensions of the mosaic are 8 metres 89 centimetres, by 6 metres 93 centimetres. The central portion, which is in bright colours, resembles a bas-relief design discovered in Rome in 1861, and engraved afterwards in the "Dictionary of Antiquities" by Messrs. Daremberg and Saglio, in the article "Admetus." The subject is the marriage of Admetus and Alcæstis.

According to the old legend, Pelias, king of Iolcos, had resolved not to give his daughter in marriage to any one who did not apply for her in a chariot drawn by two ferocious wild beasts of different species. One of the suitors, Admetus, king of Pheræ, was enabled to comply with this condition, thanks to Apollo, who had been in his service when he was driven out of Olympus for the murder of the Cyclops. The god, remembering that he had been treated with kindness by his master, took a lion and a wild boar, and constrained them to submit to the will of Admetus. The latter attached them to his chariot, and with this singular equipage appeared before Pelias, who, true to his word, gave him his daughter. This story is recorded in the fables of Hyginus, and in the Mythology in his comments upon the legend, says that the lion represents the force of the soul, and the boar the power of the body.

The ancient Nismes artist appreciably modified the legend, perhaps because he did not altogether understand it. In the Roman bas-

relief, which closely follows the Grecian story which inspired the sculptor, Apollo stands behind the boar and the lion, exerting over them a calming influence; and by the side of Apollo is the figure of Diana. The artist, instead of the god and goddess, has inserted two of the officers of Admetus; one of them has a small shield and a Grecian helmet. Moreover, instead of clothing the young princess, as in the Grecian representation which was probably under his eyes, the artist has given her but scanty array, and placed her in the centre of the design. The work appears to be of about the second century after Christ. The mosaic was evidently designed by a master-hand, and the general effect is powerful.

The borders of the tableau comprise a series of six compartments, separated one from another by a Grecian design. At the top of the tableau is foliage with stems of acanthus, in the openings of which the artist has placed several figures of animals,—a tiger tearing an antelope; a leopard, of which the skin is sadly stained, defending itself against the attacks of a serpent; a lion, with mane erect, digging his claws into the skin of a dead stag; a dog pursuing a hare; vultures, a jay, a parrot, lizards, a snail, and small birds in flight and at rest. This border has a fine decorative effect, and pleases amateurs better than the central design. The mosaic will be removed, and put together again in a Monumental Museum about to be established in the city.

M. Dardier also brought under the notice of the society the circumstance that some valuable antiquities have been discovered in a grotto near Vallon, by workmen engaged by the Nismes Company for the sale of the phosphates of the Cévennes. The treasure consists of 286 objects contained in a sun-baked vase of black earth; they consist of ancient earrings, bracelet, rings, small pearls, a pierced bear's tooth, buttons, and other trinkets.

DISTRICT SURVEYORS' ASSOCIATION.

THE members of the District Surveyors' Association have recently been very active in amending their constitution and adapting it to modern requirements. The principal alterations are the increase of the members of the committee to eighteen, the appointment of a president and vice-president, and the arrangement that at least one-third of the committee are to sit once a month to consider all questions. The old rota system is abolished. We append the names of the officers elected under the new by-laws on Friday, the 22nd ult. :—

President.—Edmund Woodthorpe.

Vice-President.—Henry Parsons.

Hon. Treasurer.—C. Fowler.

Hon. Secretary.—B. Tabberner.

Committee.—A. Bovill, E. Carritt, J. Clarkson, H. H. Collins, Banister E. C. Roe, J. H. Hanson, C. F. Hayward, T. E. Knightley, G. Lansdown, S. S. Markham, J. D. Mathews, H. Oliver, Professor Smith, R. Walker, F. Wallen, T. H. Watson, J. A. J. Woodward, and A. Williams.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE seventeenth annual meeting of this Institution was held on Tuesday evening last at the Offices, 27, Farringdon-street, Mr. Joseph Randall (of the firm of Kirk & Randall), president-elect, in the chair, supported by Mr. J. Howard Colls, the retiring president, Messrs. Thomas Stirling, Thomas Bishop, E. Graystone, E. C. Roe, B. C. Fox, E. Brooks, J. A. Robson, E. W. Holland, G. Dugg, T. H. Winny, and others.

The report and balance-sheet for the year ending December 31st last were read by the Secretary, Mr. H. J. Wheatley. The report congratulated the donors and subscribers on the fact that the past year has proved the most prosperous of any since the establishment of the Institution in 1866. The amount received as income consisted of 2634.10s. in annual subscriptions, 3311.13s. 6d. in donations, and 557.13s. 1d. in dividends on stock, making a total of 6501.16s. 7d., showing an increase of 147l. 17s. 8d. over the receipts for the preceding year. The amount paid in pensions and temporary relief was 2281.3s., the largest sum yet expended under that head, the working expenses being 711.5s. 6d., exclusive of 14l. odd spent in connexion with a special appeal to the clerks. The number of pensioners now on the Relief Fund was twelve, there being also two children who were receiving maintenance and education in connexion with the Orphan Fund. The liberal response made to the retiring President's appeal at the last annual dinner had enabled the committee to further strengthen the foundations of the Insti-

tution by investing 300l. in New Three per Cents., and 100l. in India Four per Cents. The committee referred with very great regret to the loss the Institution had sustained by the death of its late treasurer, Mr. Henry Thomas Bayes, who not only assisted in founding the Institution, but was always zealous in promoting its welfare. Mr. Edwin Brooks, who had been a very active member of the committee from the first, had accepted the post of treasurer. In conclusion, the report tendered the thanks of the committee to the retiring president for his services to the Institution during the past year,—services which had contributed to the marked success of the past year's proceedings of the charity.

The Chairman, in moving the adoption of the report and balance-sheet, expressed his determination to do all he could during his year of office to still further enhance the success of the Institution. He thought that the number of annual subscribers was hardly what might be expected from so important a body as the builders' clerks.

Mr. Thomas Stirling seconded the motion, referring in terms of regret to the death of Mr. Bayes, who had, however, been well succeeded by Mr. Brooks in the office of treasurer. The motion having been carried unanimously, the office-bearers for the following year were elected, viz.:—President, Mr. Joseph Randall, Vice-president, Mr. J. H. Colls, In-coming Members of Committee,—Messrs. J. A. Albright, R. Ball, F. T. Mullett, W. A. Rhodes, W. Seymour, R. J. Ward, and Walter D. Gilbert. Auditors,—Messrs. S. J. Thacker, Thomas Stirling, and Thos. Bishop. Secretary:—H. J. Wheatley.

On the motion of Mr. Bishop, seconded by Mr. E. C. Roe, the hearty thanks of the Institution were given to Mr. Colls for his services as president during the past year, and Mr. Colls briefly replied.

After the discussion of some other business, the meeting terminated.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Feb. 8, 1884.

2,950. W. Fawcett, Burton Salmon, and H. M. Ashley, Knottingley. Fire-places.
2,959. H. Scott, Liverpool. Grates.

Feb. 9, 1884.

3,006. G. Deacon, Northampton. Glazing roofs, &c.
3,017. J. Norris, Birmingham. Ornamental building elabs.
3,086. T. Anwyll, London. Chimney-pot.

Feb. 11, 1884.

3,052. J. Newton, Langport. Flushing water-closets.
3,057. J. Adams, Liverpool. Balancing apparatus for window-sashes.
3,061. R. C. Christian, Dublin. Securing stair-rods.
3,094. H. H. Lake, London. Apparatus for opening and closing doors, &c. (Com. by L. O. Norton, Boston, U.S.A.)
3,108. J. A. Hopkinson, and J. Hopkinson, Huddersfield. Hot-water apparatus.

Feb. 12, 1884.

3,123. W. T. Allen, Aston. Iron plates in place of brick jambs for fixing grates and chimney-pieces.
3,133. J. Jackson, Newcastle-under-Lyme. Circulation of water for heating purposes.
3,147. G. Dyer, London. Fire-grates.
3,148. G. Waller, London. Ventilating covers for sewers.
3,151. G. F. Sanders, Birmingham. Flushing water-closets.

Feb. 13, 1884.

3,214. F. W. Hagen, Hull. Waste and soil pipes.
3,220. J. Friend, Exeter. Flush-pan closet.
3,243. W. Vincent, Reading. Preventing roofing tiles being blown off roofs, &c.
3,247. J. Lewtas, Stretford. Venetian and roller-blind action.

Feb. 14, 1884.

3,254. W. R. Lester, Glasgow. Astragals of glazing bars.
3,265. W. J. Young, Greenock. Closets of privies.
3,274. S. H. Adams, York. Water-closets.
Feb. 15, 1884.
3,326. T. Caink, London. Automatic flushing of sewers and drains.
3,329. G. Kay, Killbarchan. Fixing roof rails water gutters.

* Compiled by Hart & Co., Patent Agents, 188, Fleet-street.

3,346. J. Partridge, London. Bearings of roller blinds.

3,347. T. S. Truss, Chiswick. Stench-traps.
3,349. J. & A. Law, Glasgow. Fixing rain-water pipes.

3,354. T. Welton, London. Portable water-closets.

3,363. J. Elliott and T. F. Parsons, Hastings. Artificial stone, &c.

Feb. 16, 1884.

3,389. H. Wyatt, Red Hill. Window-blind pulley-racks.
3,412. J. Booth, Bolton. Clip for glazing purposes.

Feb. 18, 1884.

3,457. J. Fraser, Arbroath. Astragals or glazing bars.
3,494. T. G. Pim, London. Soot-eradicating and sanitary glass facing.
3,521. C. Schlickeyson, Berlin. Roofing-tiles.

Feb. 19, 1884.

3,546. J. Deeley, Birmingham. Automatic flushing apparatus and water-waste preventer.
3,559. A. Waters, Croydon. Cistern float valves.

Feb. 20, 1884.

3,640. E. Surr, London. Relief decorations for walls, &c.

Feb. 21, 1884.

3,691. W. Locke, Manchester. Open fire places or grates, &c.

3,698. A. Browne, London. Rubber coverings for stairs, &c. (Com. by W. D. Hutchinson, Mannheim, Germany.)

3,725. G. Crapper, London. Ventilation of house-drains, &c.

3,732. J. S. Starnes, London. Hydro-pneumatic valve for discharging cisterns, &c.

SPECIFICATIONS ACCEPTED, I
and open to public inspection for two months from the date named:—

Feb. 12, 1884.

1,061. J. Fagan Shipdon. Water-closets.

Feb. 19, 1884.

1,412. L. Roth, Wetzlar. Manufacture of cement.

Feb. 22, 1884.

837. J. G. Strong, R. G. Strong, and J. H. Strong, Dublin. Cast-iron water-closets.

1,294. C. R. Cowie, Glasgow. Artificial stone.

NOTICES TO PROCEED
have been given by the following applicants on the dates named:—

Feb. 12, 1884.

4,773. E. Robins, London. Manufacture of cements, concrete, &c. Oct. 8, 1883.

Feb. 15, 1884.

4,868. W. Smeaton, London. Water-waste preventers. Oct. 12, 1883.

5,971. W. Brindle and T. Brindle, Upholland. Dressing stone, concrete, &c. Dec. 31, 1883.

Feb. 19, 1884.

4,927. J. S. Gabriel, London. Paving streets, &c. Oct. 16, 1883.

4,954. W. Spence, London. Application of chemical agents to stones, &c., to diminish their porosity. (Com. by M. Faure & Kessler, Clermont-Ferrand, France.) Oct. 17, 1883.

5,097. G. Asher, Balsall Heath. Ash-pans for fireplaces and stoves. Oct. 26, 1883.

5,899. D. Clarke, Birmingham, and P. Shrapnel, London. Application of tiles, tessellated, encaustic, &c. Dec. 28, 1883.

5,949. F. Walton, Twickenham. Wall decorations, &c. Dec. 31, 1883.

Feb. 22, 1884.

4,978. F. Wirth, Frankfurt. Curtain-holders. (Com. by J. Wass, Karlsruhe, Germany.) Oct. 18, 1883.

4,979. E. French, Birmingham. Castors for furniture. Oct. 11, 1883.

ABRIDGMENTS OF SPECIFICATIONS,
Published during the week ending February 16, 1884.

2,924. A. R. Lensk and E. Torrini, London. Compound or material as a substance for stones, marble, &c. June 12, 1883. Price 2d.

This is made of bone dust, asbestos, farina, albumen, coal dust, horn shavings, and powdered slate. (Pro. Pro.)

3,064. J. D. Sprague, London. Latches, bolts,

or fastenings for doors, windows, &c. June 20, 1883. Price 6d.

In a rectangular shell is pivoted a tumbler so weighted that when the window or door is closed the tumbler impinges on a slotted plate in the frame, and enters the same. It can be released therefrom by the pressure of the finger-nail in an indent.

3,081. J. Noyes, Pollockshields. Ventilating sewer trap. June 21, 1883. Price 2d.

The part that contains the ventilators and the coupling with the pipes is made separate from the cesspool. (Pro. Pro.)

3,181. C. W. H. Brock, Bishop's Waltham. Holding and adjusting roller blind cords. June 26, 1883. Price 2d.

On a horizontal rod is an eccentric disc counter weighted which can jam the cord. (Pro. Pro.)

3,225. E. Raitt, London. Water-waste preventers. June 29, 1883. Price 6d.

An oscillating vessel of a semicircular section is supported horizontally in a cistern of a quadrantal section on the water supply pipe at one end and on the overflow pipe at the other end. The water is admitted to the vessel by a ball valve inside the same, through a passage in a casting which surrounds the horizontal supply pipe, and which, being secured to the end of the vessel, supports it on the pipe. This passage is so made that immediately the vessel is inclined to empty the same and cause a flush the supply pipe is closed and no more water can enter until the vessel is returned to its level position, which is effected automatically as the vessel is pivoted out of its centre line so that one side is heavier than the other. A low transverse mid-feather is formed in the bottom of the cistern so that when the vessel is supplied some of the water is retained behind and passes away through small holes in the mid-feather, thus causing an after-flush. An inclined plate is fitted below the oscillating vessel to prevent the water splashing over.

Published during the week ending February 23, 1884.

3,146. M. Syer, J. Gilmore, and W. R. Clark, London. Flushing apparatus and waste-not valves to be employed therein. June 25, 1883. Price 6d.

The outlet pipe from the cistern is governed by a flexible diaphragm, which is pressed home to its seat by a spring from a dome above. When the handle of the closet is lifted the air is exhausted from the space between the diaphragm and the dome, whereby the diaphragm is lifted and the water flows down until the vacuum disappears, when the diaphragm is again pressed down by the spring.

3,200. H. Burgin, Walthamstow. Appliances for inducing air from chimneys, &c. June 27, 1883. Price 6d.

Round the top of the chimney is placed a cylinder, which extends above the head of the flue, and has a series of vertical T or L shaped apertures or divisions, up which the air rushes.

3,204. J. Farrimond and J. Whittaker, Southport. Ventilating water and other closets. June 28, 1883. Price 6d.

An upcast shaft, which is jacketed to maintain its temperature, is connected with the basin of the closet.

3,212. W. E. Diehl, Philadelphia, U.S.A. Door retention stop. June 28, 1883. Price 2d.

A cup is fixed on a standard on the floor and an elastic ball on the door. When the door is opened the ball is forced into the cup, whereby the door is retained in its position. (Pro. Pro.)

3,226. A. Selim, London. Driving gear, with continuous motion applicable to ventilators. (Com. by P. C. J. Lemaire and A. E. Poley, Paris.) June 29, 1883. Price 2d.

The ventilators are driven by a hand-lever or a pedal through a series of friction clutches and wheels. (Pro. Pro.)

3,311. D. G. Cameron, London. Flushing apparatus. July 4, 1883. Price 6d.

The cistern is divided into two compartments, in each of which is a syphon. The short legs of these syphons consist of caps over the long legs, and the caps are connected to a lever, pivoted in the middle between them in such a manner that when one of the syphons is closed by the cap resting on the mouth of the long leg the other syphon is open. A chamber is formed below the cistern, into which both the long legs of the syphons open, and low partitions are made to retain some water in both sides of this chamber, sufficient to seal these long legs, and the flushing-pipe issues from the middle of this chamber, between the partitions. When the water is admitted to the cistern, nearly up to the level of the mouth of the stand-pipe, the lever is drawn down, and the cap that had closed the mouth of its long leg is lifted off the same, thus creating a vacuum, whereby syphonic action is set up, which empties this compartment and causes a flush. When this is finished the lever is released, and the other cap is lifted, and the water in the other compartment gives the after-flush.

5,152. W. R. Lake, London. Plumbers' traps. (Com. by T. N. Du Bois, New York, U.S.A.) Oct. 30, 1883. Price 2d.

These are drawn from a single piece of soft metal, with two or more seals.

Asthall.—The Church of St. Nicholas, Asthall, Oxon, is to be restored and re-roofed under the superintendence of Messrs. Collier & Merrin, of Rood-lane, London. Mr. Alfred Groves, of Milton-under-Wychwood, Chipping Norton, being the contractor for the works. The chancel is not included, but it is hoped that the necessary works to this will be undertaken by Eton College at the same time.

CARSHALTON, SURREY.

Of the many pretty villages that formerly surrounded London, but which have been gradually swallowed up in its rapacious growth, Carshalton is one of the very few that retains most of its primitive picturesque. A full account of this ancient parish and its church has been well written by Mr. Thomas Milbourn, architect, and published in the seventh volume of the "Collections of the Surrey Archaeological Society." The monuments and brasses in the church have also been described in an interesting paper by Mr. J. G. Waller in the same volume. Opposite the venerable church stands Stonecourt Lodge (long the residence of the late Mr. Jonah Cressingham, the well-known agriculturist), with its open grounds, ornamental pond, and waterfall, forming a picturesque group in the heart of the village that few Londoners have seen, excepting those who drive from London to Epsom, *via* Carshalton. A fine pair of Queen Anne wrought-iron gates at the entrance to Mr. Colman's park is well worth the inspection of those who take an interest in that kind of workmanship. In Brayley's "Surrey" we read,—
"Close to the churchyard is a well of the purest water, and tradition has connected this with the memory of Queen Anne Boleyn. According to report the spring arose suddenly from a hole into which her horse had, accidentally stuck its foot whilst passing here."

Queen Anne Boleyn's well is covered over or protected by a "cambered" or arched stone, a method frequently used in Surrey to protect wells, and thereby probably, in the opinion of some, originating the name of Camberwell, now a suburb of London. The chief attraction, however, of Carshalton is, thanks to Mr. Ruskin, the famous well or spring where the river Wandale takes its rise, and after passing through Wimbledon falls into the Thames at Wandsworth. In 1875 this spring having become choked up, and the well being in a very neglected condition, Mr. Ruskin had it restored, at a cost of about 500*l.*, and placed a quaint inscription over it, as follows: "In obedience to the Giver of Life, of the brooks and fruits that feed it, of the peace that ends it, may this well be kept sacred for the service of men, flocks, and flowers, and by kindness called Margaret's Well. This pool was beautified and endowed by John Ruskin, Esq., M.A., LL.D." Margaret was the Christian name of Mr. Ruskin's mother. The well lies by the side of the roadway, and may be fairly said to yield the only drop of pure spring water to be obtained within ten miles of London, but the inscription,—where is it now? A piece of bigotry or red-tapism caused it to be feared that, having Mr. Ruskin's name attached, that either he or his successors might hereafter lay claim to the place, so the authorities objected to the inscribed panel, and ultimately it was taken down. But although Carshalton possesses most of its pristine beauty and quaintness, a good deal of modern building, public and private, has lately taken place. Among the new buildings may be mentioned the Carshalton Public Hall, a spacious building, erected in 1874, for public meetings, concerts, and other entertainments, by Mr. Charles Coles, builder, from designs furnished by Mr. J. D. Hayton, architect, of 5, Whitehall, and Carshalton.

By far the most important works erected in this neighbourhood of late years have been the Board schools, built for the Carshalton School Board. These occupy a site at the junction of Camden-road and West-street, having frontages of 250 ft. by 120 ft. to those streets respectively, and occupying a space of nearly three-quarters of an acre. The site cost 820*l.*, and is covered by three blocks of buildings,—the girls' the boys', and the infants' schools, but they have been erected at different periods. The foundation-stone of the girls' school was laid June 24th, 1874. The accommodation is similar to that in the boys' school, which is for 250 girls; it was erected by Mr. D. Stewart, builder, from drawings by Mr. A. G. Hennell, architect. The cost of erection, including board-room, mistress's residence, clerk of works, architects' commission, and desks and fittings, amounted to 2,676*l.* 1*s.* 11*d.* The boys' school, 70 ft. by 20 ft., has two classrooms, 21 ft. by 16 ft. 6 in. each, cloak-room, and conveniences attached, to accommodate 250 boys. The heating apparatus is on Messrs. Bacon's high-pressure system. The foundation-stone informs us that "this building was publicly opened on the 9th of January, 1878

by Sir Trevor Lawrence, bart., J.P., M.P." Mr. F. T. Trebble, builder, carried out the work from the designs of Mr. J. D. Hayton, architect, of Carlshaton, at a cost of £20,144. 1s. 1d. The third block is the infants' school, 50 ft. by 20 ft., with babies' room, 20 ft. by 20 ft., class-room, lavatory, conveniences, &c., attached, to accommodate 200 children. The heating apparatus is by Mr. Jones, of 42, Farringdon-street. The commemoration-stone says, "This Building was publicly opened on June 4th, 1883, by the Right Hon. the Earl of Egremont, Mr. J. Baines, B.A., chairman, Mr. H. W. Crawford, vice-chairman," &c., "J. D. Hayton, architect, and S. J. Evans, builder." This block cost (including paving playground, boundary walls, and architect's commission) 1,288l., so that the total cost of the three blocks, including site and incidental charges, amounts to only 6,793l. 3s. All the schools are well lighted and ventilated; they are faced with red bricks and Bath stone dressings. The conveniences are on the dry-earth system. The infant schools are built with selenitic mortar.

WESTMINSTER ABBEY: PROPOSED CAMPO SANTO.

SIR,—I have perhaps as much veneration for the relics of bygone days as Mr. Somers Clarke himself, and would, I believe, be the last to recommend the destruction of any fragment belonging to the past, without adequate cause for so doing. But I confess I have very little sympathy with the extreme doctrines of those who will allow of no change, and would stop all improvements because some comparatively insignificant building is interfered with, or some long-decimated site must be utilised.

In the present instance, I confess I cannot speak of the Infirmary Hall or Ward from personal knowledge. It is incorporated in a private dwelling-house, and therefore not accessible to ordinary "Cockneys." But if the Ordnance Survey is to be trusted, it is only the northern portion that can remain entire, or nearly so, and though that may be sufficient to enable a clever architect to rebuild and restore the whole, the question then arises, Is a restored infirmary-hall a more desirable or appropriate occupant of the site (the "residence" must come down, and be removed in either case) than such a building as I propose should be erected on the site?

I have seldom, I confess, been more puzzled than by Mr. Clarke's very detailed plan and description of St. Catherine's Chapel. When I looked in upon it, I saw nothing but a very ill-kept garden, and, believing in consequence that it had entirely vanished, I looked no further. The question between us can easily be settled by evidence that no one, I believe, will be inclined to dispute. If any one will carefully examine the published sheet of the Ordnance survey, containing the precincts of the Abbey, to the scale of 88 ft. to the inch, he will see, that while the surveyors mark with the most scrupulous accuracy every room in every house in the neighbourhood, they failed to detect the existence of any vestiges of the chapel. They represent the site of "St. Catherine's Chapel" as wholly occupied by a garden or shrubbery. They neither saw "the chancel" nor its altar, "nor the considerable portions of the chapel which are complete." At least they did not mark them on their plan. I do not doubt, nevertheless, that some portions of its outer walls may be incorporated in the neighbouring houses, and that a clever architect from them, and by excavation, might restore its plan and elevation with more or less accuracy. But as nothing is now visible, on the site above the ground-level, it is evident that if the chapel is to be made visible to "Cockney" eyes, it must be rebuilt from the foundation, and here, as in the case of the Infirmary Hall, the question arises, Would a spick-and-span new nineteenth-century Infirmary Chapel be a better or more appropriate occupant of the site than the new south transept I suggested?

In my scheme I did not propose to interfere with the "elype" nor with the houses on the north side of the "little cloister"; they may, as far as my proposal is concerned, remain in all their pristine meanness; but I confess I have no sympathy with the "boundary-wall," which has certainly no beauty, and the sooner it is cleared away the better.

In his letter to you, which I am attempting to answer, Mr. Somers Clarke states that he considers the buildings that would be destroyed

by my scheme "as interesting as the Jerusalem Chamber or the College Hall." If this is his opinion I can only say it is not mine. These two apartments have considerable architectural merit, and are brimful of historical and other interesting associations. I am not aware of any historical or other local interest that attaches to the Infirmary buildings of the Abbey, and it remains for Mr. Clarke to show what architectural beauty is to be found in the Hall, while I can answer for none attaching to the Chapel, so that my regrets for their being replaced by such a building as I proposed would be of the most evanescent character.

At the present moment two of the Canons, being dissatisfied with the "second-class residences" provided for them in the old Infirmary buildings, are providing themselves with new "first-class residences" in the college-gardens, and I have no doubt that any others that may be displaced by my proposals will be only too glad to follow their example. While this is so I confess I cannot share Mr. Clarke's fear, that "presently there will be no one left to bury the illustrious dead, or serve the altar." With our growing population and increasing number of clergy I do not think there is much room for anxiety under these heads, even were my scheme ten times more extensive than it happens to be.

If nothing can be urged against my proposed new south transept more cogent than the few somewhat irrelevant objections contained in Mr. Somers Clarke's letter in your last issue, I feel convinced that, before long, my proposals will be considered worthy of serious attention, not only by the public, but by those more immediately concerned in providing increased accommodation in Westminster Abbey for sepulchral purposes.

JAMES FERGUSON.

20, Langham-place, Feb. 25, 1884.

SIR,—In reference to Mr. Ferguson's communication [p. 227] on Sir Gilbert Scott's scheme for a Campo-Santo next Westminster Abbey, and his own suggestive illustration of a "transept," or "monumental chapel," there scarcely seems to be real need for any such addition. Doubtless the interior of the Abbey will at some distant date cease to be available for the ashes of the illustrious dead; but even then a large space remains in the garth, or central area of the cloisters, where, it is believed, no bodies, or extremely few, have hitherto been interred, animal remains only having been found on recent excavation. Still, there is ancient precedent for appropriating such open ground for the graves of those whom men most revered. We read in the "Antient Rites of Durham" that, "Long before the church was finished the body of St. Cuthbert was by the said Bishop Ranulph translated again out of the cloister-garth, where the said Bishop Carlpho had made him a very sumptuous tomb to lie in." Again, the difficulty noticed by Mr. Ferguson that interment in an adjoining Campo-Santo (or, indeed, modern transept or chapel) would not be considered as "equivalent to being buried in the Abbey" is practically solved by the cloisters forming so component a part of the venerated precincts.

E. L. TARBUCK.

MECHANICAL AIDS TO SCULPTURE.

SIR,—With reference to the machine described by Mr. George Simonds, on page 141, as an aid to sculpture, I would beg to draw attention to the machine made by Messrs. Kennan, the well-known lathe-makers, of Liahentle-street, Dublin, for the late Mr. Charles Shaw, of that city, and which is described and figured in the "Illustrated Catalogue of Machinery in the Great Exhibition of 1851."

This machine, which was placed on an ordinary lathe-bed, had all the arrangements described by Mr. Simonds, but on a much smaller scale. The tables or horizontal chucks for the work, and the object to be copied, were driven at an exactly uniform speed by worm-wheels and tangent screws, and in order that straight line mouldings, as on the plinth of a statuette, might be truly reproduced, there was an arrangement beneath the bed of proportionate slides, by which the object and copy could be traversed to and fro beneath the drill and tracing-point at rates proportionate to the relative size of original and intended copy. To enable this to be done, the tangent screws

driving the chucks were fitted as sleeves on the hexagonal bar or rod which conveyed motion to them, and the screws thus remained in gear with the chucks while the latter were in motion.

The drill and tracing-point were fixed at the points required on a long bar suspended above the work, with a universal point adjustable vertically, as described by Mr. Simonds, and, in fact, the arrangements are almost exactly similar, except that Mr. Shaw's machine has the advantage of the proportionate longitudinal movement which I have attempted to describe. It will thus be seen that there is no new feature in the appliance described by Mr. Simonds, except that it is only used for pointing in place of mechanically copying.

HENRY D. CROZIER,
Lieut.-Col. R.E.

SIR,—I have read with much pleasure in your issue of the 16th inst. Mr. M. P. Morris Bale's letter, in which he describes in the plainest and most lucid manner the machines constructed by Watt for copying sculpture. I fear, however, that I cannot admit that these machines were quite successful, because, although I am well aware that they did reproduce sculpture, I do not believe that such reproduction was or could be satisfactory, from an artist's point of view, on a machine of such construction as the Eidograph of Watt. There are two causes of imperfection, which cannot easily be got rid of,—namely, elasticity in the parts of the machine itself, and wear of the cutter or drill; I believe, also, it is a fact that the use of this machine was abandoned, which does not look like a complete success. I say nothing of the other machine, because there are plenty of reducing instruments which work well on a small scale.

GEORGE SIMONDS.

152, Buckingham Palace-road, S.W.

VENTILATION.

SIR,—Your valuable publication frequently contains dissertations on ventilation, often instructive, but not always so. The modes propounded cannot all be correct; especially, I should say, those which resort to artificial means, to the partial or total exclusion of natural ones. If perverted ingenuity were spent in the invention of a machine to help a river over a waterfall the wise would only smile at it; but it is not so certain that the gaping multitude would do so. Human nature believes in the mysterious, and hence the faith in machines and apparatus so widely applied to the ventilation of halls and theatres. If the river is not obstructed it will find its way over the cascade without help: so with halls. If only freedom of action is allowed them they will ventilate themselves. Such places are like a butt of water acting the reverse way. Make a hole in the bottom and out rushes the water; make a hole in the roof and out rushes the foul air. The water is heavier than the atmosphere and down it falls; the foul air is lighter, and up it rises. Ventilation is a common action of nature, and needs no machinery. All it asks is not to be obstructed. But it must have free course. There must be outlet above and inlet below. These provided, ventilation will proceed without the assistance of engineering of any kind.

EXPERIENCE.

SIR,—In reply to the letter on p. 180, I have ventilated such a dining-room in my own house, 20 ft. by 16 ft. I went on the plan laid down by Capt. Douglas Galton, as follows:—"That the simple forms of ventilation rest on the principle of an outlet for the warmed air and an inlet for fresh air." The position of the inlet is of material importance, because the question as to whether draughts are felt or not necessarily depends upon that. It is desirable to admit fresh air, especially cool air, at the upper part of the room, above the heads of the occupants. It thus becomes partially warmed by the air already in the room. The Sheringham ventilator is admirable in this respect, in that it is placed near the ceiling, and the incoming air thrown upwards. If, in addition to the Sheringham ventilator a flue be carried up from near the ceiling of a room, the air of a room, warmer than the outer air, will pass up the flue, if a warm one,—and its place be supplied with air. 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ment the upper stratum of air in the room is continually exchanged imperceptibly, and without draught. A great advantage, too, from this plan is, that when all have retired to bed, the action of these vents is not impeded, and the air in the room is absolutely fresh in the morning.

These have now been fixed two years and a half, and I find that the close, stuffy atmosphere from the gas and exhalations from the persons in the room, have been entirely removed.

The Sheringhams can be closed if there is a high wind, or during the day when there is no gas. However, mine are practically always open.

I obtained the ventilators from Messrs. Hayward Brothers, the makers, and they are easily fixed by a handy local man.

I frequently show friends after dinner how they act, by a lighted taper, which, on being held near the Sheringham is almost blown out, and when it is held near the Boyle's vent in the chimney-breast the current into the flue sometimes snuffs out the taper. Several have adopted this plan with satisfaction.

I. In reply to the first question, I have found that cold air brought by vertical tubes often attains such a velocity that it strikes the ceiling, and is deflected down, which added to its own superior weight, causes a feeling of draught, while air let in by a Sheringham ventilator direct through the wall does not attain such a velocity, and is diverted upwards by the sloping door and along the ceiling, and no draught is experienced.

II. The cast-iron pipe would be useless as an outlet, and it would generally act as an inlet.

III. No; the only way is to lead it into a flue, which must be warm, or there will not be an ascending current.

W. E.

THE VENTILATION OF THEATRES.

THE LYCEUM, THE HOUSE OF COMMONS, ETC.

SIR,—I have read Mr. J. P. Seddon's paper on "The Ventilation of Theatres" [p. 225, 232, ante], and if the hygienic condition of theatres in London is on a par with that of the Lyceum, I can fully endorse his remarks. On two visits lately to see Miss Anderson, in the "Lady of Lyons" and "Pygmalion and Galatea," although the house was not uncomfortably filled, the air was so vitiated and attenuated by the time the second act was reached as to greatly neutralise the enjoyment of the acting and spectacular effects which have made the Lyceum so deservedly renowned; and it is a pity that, with all the progress in dramatic representation, the hygienic condition of the house is not of equal excellence.

The suggestion that the *plenum* system of ventilation should be adopted for theatres is worthy of consideration; nevertheless, the application of this principle has not always been attended with success. In the Strangers' Gallery of the House of Commons during the debate on the Address last week I was struck with the unquestionable vitiation and heat of the air; a two hours' stay produced on myself and others a degree of languor accompanied with a headache, both evident signs of imperfect ventilation, and, if I mistake not, the House of Commons is ventilated on the *plenum* principle. Probably the floor of the House was agreeable enough, but the galleries! What must be the condition of the reporters in the opposite gallery, after hours of continuous and exacting labour, in a crowded house!

The problem of ventilation for large public buildings is a most difficult one to solve, and even now is as far from having received a practical and proved solution as ever. The Free Trade Hall, Manchester, is generally considered to be well ventilated, but when it is well filled, it is, from my own experience, far from satisfactory. The downward principle of ventilation, where the air inlets are at the upper part of the rooms, and the air outlets at the floor level, has been applied to the lecture-halls, &c., of the Glasgow University, but has not given universal satisfaction, if one may judge from the discussion at the Institution of Civil Engineers which followed the reading of a paper describing the application of this principle of ventilation.

Some time ago I suggested the use of hot water or steam coils fixed opposite all the air inlets in the corridors of public institutions, and the utilisation of sun-burners or regenerative-lamps, both very effective air-exhausters, for producing the necessary vacuum.

If the walls dividing the auditorium from the corridors were sufficiently supplied with openings covered with fine wire gauze, the air would then pass into the corridors through the external walls of the theatre, &c., becoming heated on impinging on the heated coils of pipes, would collect, become diffused and equable in temperature, and then imperceptibly enter into the auditorium through the gauze-covered inlets.

That the proper position for air inlets in an inhabited room is close to the ceiling, is further confirmed by the following results of observations of the carbon-dioxide (CO_2) in the air of a sitting-room, for which I am indebted to Prof. Thorpe, F.R.S., F.C.S.

Quantity of CO_2 contained in a sitting-room, in which two candles were burning:—

	Per 10,000 vols.
Carbon-dioxide, near the floor.....	7.33
Ditto half-way up.....	9.00
Ditto near the ceiling.....	14.65

According to Dr. Parkes, the quantity of carbon-dioxide (CO_2) in air permissible, for healthy respiration should never exceed six volumes in 10,000, the normal quantity in atmospheric air being four volumes of CO_2 per 10,000.

B. H. THWAITE, F.C.S.

HOLBORN HILL IMPROVEMENTS.

SIR,—I perceive that some interest was expressed at the Architectural Association meeting of the 15th ult. [p. 253], on the proposal of the late Mr. Bunning to alter the level of Holborn Bridge. I was an assistant in the office of the "Clerk of the City's Works,"—such was the official designation of the City Architect in my day,—when such a plan was mooted, and I have a vivid impression that it merely extended to raising the level of the crossing of Farringdon-street 6 ft. Such an alteration would have easily admitted an incline in Farringdon-street by which to ascend to the new level of Holborn Bridge.

At the same time, the descent of Holborn Hill might have been made so much more easy, that to those familiar with its former alarming steepness, the alteration would have seemed a solid and valuable improvement. Besides, that pretty bit of old London scenery, St. Andrew's Church, in its dignified position above the level of the street, would not have been so entirely sacrificed as it is now. But I fear a new generation would not have been so easily satisfied. The old steep slope having passed out of mind, the new easier slope would have been thought a muddle and a makeshift. I do not apprehend that Mr. Bunning was very enthusiastic about his own scheme. He probably thought it more within the range of possibility as regards pounds, shillings, and pence than a viaduct scheme. A hasty plan was made out to lay before some committee, but no attractive set of plans, elevations, and sections to show necessary alterations to the adjacent houses was ever entered upon in the office during my experience there.

GEORGE MACKENZIE.

Holloway, N., Feb. 26, 1884.

THE LATE MR. WILLIAM CROSS.

SIR,—I have not seen in any of the trade papers a notice of the death of Mr. William Cross, of 105, Blenheim-crescent, Notting-hill, who for many years had the entire management of the masonry department for Sir John Kalk, and in later years for the firm of Messrs. G. Smith & Co.

Many large and important works have been carried out under his superintendence, notably the Prince Consort's Memorial (of which he had the entire charge), the Grosvenor Hotel, Manchester Town-hall, the extensive alterations at Eaton Hall for the Duke of Westminster, and Meaford Hall. Mr. Cross was an enthusiastic lover of his trade, and it will be in the recollection of your readers that some time ago he took an active part in writing about the decay of stone in London, &c.

He died on the 8th ult., deeply regretted by all who knew him, and was buried at Kensal-green on the 14th ult., a very large concourse of friends being present.

By the demise of Mr. Cross the trade has lost a man highly respected both by employer and employed, and by all who had dealings with him, a man of large knowledge, upright, and of sterling integrity.

SAMUEL TRICKETT.

PIPES v. FAÇADES.

SIR,—The wishes of your correspondent "Belsize" [p. 285, ante] have been anticipated by Mr. Harrington, of Ryde, who has a patent for ventilating sewers which has been tried and reported on as very successful by Sir E. Rawlinson and other competent authorities. We are engaged making tiles for it of red and white brick to harmonise with the colours of houses already built. These will be shown at the forthcoming Health Exhibition, and a trial is about being made in a London street of houses built of white brick.

DOULTON & CO.

Grove-road, Victoria Park, E.
Feb. 25, 1884.

LLANELLY HOSPITAL COMPETITION.

SIR,—In your reference to this competition in the last issue of your journal [p. 285], it is stated that Messrs. Wilson & Dyer, of London and Swansea, were placed second by Mr. Salter, the referee.

Will you permit me to say that the order should have been reversed, and the note have read thus:—Wilson and Dyer (joint architects), of Swansea and London?

CHARLES E. DYER.

Restoration of Wood Carvings at

Lubeck.—The work of restoration for some time in progress in the "War Chamber" of the Lübeck Rathaus has been completed, and the result is spoken of in the German press as doing justice to the artistic wood carving of the apartment. There is a project before the authorities for providing the room with a carved wood ceiling, for which Herr von Grossheim, of Berlin, has drawn up a detailed plan.

INTERNATIONAL HEALTH EXHIBITION

PREPARATIONS for the holding of this Exhibition are proceeding rapidly. The Board of Trade have certified that the Exhibition is an International Exhibition, and exhibitors thereat will accordingly participate in the privileges accorded by the Patents, Designs, and Trade Marks Act of 1883. The officers of Her Majesty's Customs have also announced that the Lords of the Treasury have consented to the buildings being considered as a bonded warehouse during the continuance of the Exhibition, as was the case at the late Fisheries Exhibition. The General Committee now numbers nearly four hundred members, and from these, seventeen sub-committees have been formed.

In response to a request made by his Royal Highness the Prince of Wales, president of the Exhibition, the eight water companies of London have resolved to exhibit in a pavilion which is being erected for them, their appliances for the supply, filtration, &c., of water, together with diagrams showing the various processes and localities; and a powerful sub-committee, under the active chairmanship of Colonel Sir Francis Bolton, has been formed to carry out this branch of the Exhibition. The water companies have also determined to put up in the grounds a large fountain, which will be illuminated at night by electricity. This fountain of light will, it is anticipated, materially add to the beauty of the illumination of the gardens.

It is impossible, as yet, to give any definite information with regard to foreign countries; but, so far as one can judge at present, Belgium, China, and India will be the best represented. A Royal Commission has been appointed in Belgium, and the Consul-General in London is their active representative there. To China has been allotted the space which it occupied last year at the Fisheries Exhibition, and a Chinese tea garden, restaurant, and shop will not be the least interesting objects in the Exhibition. India is to be adjacent to China, and strenuous exertions are being made to secure the united action of many of the principal tea-planters in India, so as to insure a good and representative show of the Indian tea-growing industry.

INTERNATIONAL HEALTH EXHIBITION, 1884.

"PROPOSED MODEL HOUSE."

SIR,—I was pleased to see that my letter, signed "Sanitary Engineer" (p. 217, ante) elicited approval from some other of your correspondents, and I most cordially approve of the suggestion of Mr. H. H. Bridgman that you, sir, would be doing a great public service if you would bring this question before the Exhibition authorities in a tangible form. It certainly should not end simply in letter-writing, if only for the sake of our foreign and colonial contributors, who naturally look up to an international exhibition held under the auspices of H.R.H. the Prince of Wales as one in which the strictest justice will be done. Now if the proposition of the sub-committee is carried out, it will be most unjust both to the general public and exhibitors, and will doubtless prove to be very prejudicial, if not disastrous, to the success of the several international exhibitions proposed to be held in London during the next few years.

I feel certain if this matter were brought directly under the notice of his Royal Highness, such steps would be at once taken as would prevent at least one section of the International Exhibition of 1884 becoming "a great shop" for the special advertising of the wares,—good or bad as they may be,—of a certain few firms.

SANITARY ENGINEER.

Death of Mr. William Huggins.—The death is announced at Christleton, Chester, of Mr. William Huggins, the well-known animal painter, aged 63. Mr. W. Huggins was born in Liverpool in 1820. He obtained recognition by his faithful delineations of wild beasts in Wombwell's Menagerie. He afterwards received the name of the "Liverpool Landseer." His highest powers were perhaps shown in his partially-tinted crayon studies of lions and tigers, some of which were distinguished by remarkable power of drawing and foreshortening, and catching the very nature and character of the animal's action and expression. Mr. Huggins received his early artistic education at the old Liverpool Academy in its palmy days. He afterwards resided at Chester, Bettws-y-Coed, and Llanbedr, where he lost his wife, and then returned to Christleton, Chester, where he died in consequence of partial paralysis. Mr. Huggins of late years has only been able to follow his profession with extreme difficulty.

BREACH OF BUILDING BY-LAWS.
CONCRETE.

At the Brentford Petty Sessions on Saturday, before Mr. F. H. N. Glossop and a full bench of magistrates, Mr. W. H. Waters, builder, The Common, Ealing, appeared to a remanded summons issued at the instance of the Ealing Local Board, charging him with neglecting to comply with the tenth by-law of that authority, which provides that every domestic dwelling-house to be erected in the district shall have a "layer of 'good cement concrete' of 6 in. thickness upon the ground surface within the external walls of the building. The case had been adjourned from the 9th day of February, when the defendant had contended that in using a concrete made of blue lias lime, as contained in the specifications of his contract, he had complied with the by-law.

Mr. Charles Jones, Surveyor to the Ealing Board, claimed that concrete made of blue lias lime did not constitute a cement concrete, and the summons stood over for the production of expert testimony on the subject. The case gave rise to much local interest, as during the last few weeks a number of convictions against "good cement concrete" in the Ealing district has been obtained, and the defendants fined in substantial penalties.

The prosecution called Mr. James Woodhouse, who deposed that he had had considerable experience of all kinds of concrete work; he had been engaged on sea-walls, and under General Gordon on the forts in the Shereens district. He did not consider that concrete made of blue lias lime came within the definition of "good cement concrete"; the two things were different. The one was a lime concrete, but was not cement concrete. The one, Portland cement, was made of chalk and clay, the other of stone.

The evidence of Mr. Jones was read over, and in cross-examination he stated that the by-law was framed upon a modern edition of the Model By-laws of the Local Government Board, and had been approved by the Department. It was not an exceptional by-law, though he could not say whether other sanitary authorities in this district had it in force. The by-law did not demand a Portland cement concrete, but this was the only one he should consider to be a "good cement concrete." (The Chairman thought it a pity that Portland was not mentioned specifically in the by-law.) Mr. Jones replied that the by-law was strictly modelled upon those issued by the Department. In further cross-examination, the witness admitted that both Portland cement and blue lias lime were of a binding character; but the object of this by-law was to prevent damp rising.

The Chairman, in fining the defendant 5*l.*, said the Bench had to determine whether, in their opinion, the by-law had been complied with. A concrete made with blue lias lime might be ten times better than concrete made with Portland cement; but if it was not "good cement concrete," the defendant had infringed the by-law. When builders came into a district to construct houses, they should make themselves acquainted with the by-laws of that district, and comply with their terms, such as had not been done in this instance. He refused to grant a case, as the question was one purely of fact.

FEES FOR SUPERVISION OF DRAINAGE.

TODD V. GREENWICH DISTRICT BOARD OF WORKS.

THIS case (if not set aside on appeal) settles a point which has been much debated between surveyors, acting on behalf of private owners, and Local Boards, which derive their powers from the Metropolitan Local Management Act. It was an application for a Prerogative Writ of Mandamus to issue commanding the Board of Works for the Greenwich District to pass certain plans for drains and sewers on an estate belonging to Mr. C. W. Todd at Old Dover-road, Blackheath, and to give their sanction in writing to the construction of such drains and sewers, pursuant to sections 47 and 48 of the said Act.

The plans had been prepared by Mr. Todd's surveyor, and sent to the Board of Works for their approval, in accordance with the provisions of the Act in that behalf. The Local Board, in their turn, sent these plans on to the Metropolitan Board for their sanction. Shortly after this the Local Board's surveyor wrote to Mr. Todd's surveyor, telling him that his plans had been sanctioned by the Metropolitan Board, and that the consent of the Local Board would be given on Mr. Todd sending them a cheque for 35*l.*, "on account of the cost of supervision." In reply to this, Mr. Todd's surveyor wrote informing the Board's surveyor that there was no power in the Act to make any such charge, and that it would not be paid. As it was found impossible to induce the Board to give their sanction without legal proceedings, such proceedings were accordingly instituted, with the result that on each occasion when it has come before the Court (three times) the justices have unanimously decided that the charge is not provided for by the Act, and is consequently quite illegal. The contention of the Board's counsel was that, inasmuch as under sec. 52 the Board have power to make the drains and sewers themselves, and can charge the owner all that it may cost them (which would include a charge for the salary of the clerk of the works to supervise), that

they ought not to be placed in a worse position (in the interest of the ratepayers) when the owner elects to do the works himself. In answer to this contention the judge pointed out that the two sections were on a totally different footing, and that he could not construe sections 47 and 48 together with section 52.

It was then very strongly urged by the Board's counsel that it was necessary that the Board should be at liberty to appoint a nominee to supervise the works while in progress, as almost immediately after their completion they would become the property of the Board, and would have to be repaired and kept at the expense of the ratepayers; but, in answer to this contention, Mr. Justice Day pointed out that if the owner did the works improperly, he would be subject to a penalty of 50*l.*, and that they, the Board, could appoint a nominee to supervise, if they liked, but that if they did so they must pay him themselves.

CHURCH BUILDING NEWS.

London.—The new north aisle of the Church of St. Mary Magdalene, Munster-square, was lately opened for use. It is erected in memory of the founder, the late Rev. E. Stuart, its first incumbent, who, in 1849-52 erected the nave, chancel, and south aisle, from the plans of the late R. C. Carpenter. He also provided for and left plans for this new aisle, and for a south-west tower and spire. These plans for the aisle have been carried out with a crypt under its whole length, used as work and caretaker's rooms, and for a mortuary, under the direction of Mr. R. Herbert Carpenter and Mr. B. Ingelow. The idea of the design was based by the architect on the grand lofty town parish church type, with wide side aisles of almost equal proportions with the nave,—such a church as the ancient one of Austin Friars in the City of London was. The arcades are of five bays each, with a bay to the chancel aisles. The windows are of three lights at the side and four and five at the west and east ends respectively. A turret, with stairs descending to the crypt, stands on the north side, crowned with the sanctus belfry. The north porch is groined with stone, and has moulded and carved archways and ribs; the gable is filled in with a richly-carved cross, with the emblems of the Evangelists, and crowned by the representation of the "Pelican in her piety," on a ground of diapered carving. The new work, like the old, is built with Kentish rag stone, with Bath stone dressings, and the roof is covered with tiles. The church now measures 110 ft. total length, and is 69 ft. wide inside. The contractor was Mr. Bentley, of Waltham Abbey, and Mr. Creed was the clerk of works. The whole of the older portion has been carefully cleaned, including the painted figures and decoration of the sanctuary. The formal completion will not be till Ascension Day, as the external fencing, &c., has yet to be done. The church has very deep foundations, and the new work stands on a beautiful sand; the older part of the church had bad foundations, the ground having been disturbed; it has, therefore, a crypt entirely under it. Messrs. Kelk were the builders then employed under the late Mr. Corby as clerk of works. All the windows of the older church were filled with stained glass; the finest are by Clayton & Bell and by Hardman, from the late A. W. Pugin's design. At the east end of the new aisle is an altar raised on three steps for occasional use. It has a dossel behind it, and by the wish of the Bishop, a curtain is drawn on the parclose screen between it and the chancel during its use. The whole of the church is well lighted all round, and the tower and spire will stand at the south-west angle and be used as the principal entrance. The northern entrance, now the chief one, will have gates added to it, the work of the hands of Messrs. Phelps, sons of the Master of Sidney Sussex College, Cambridge. The first stone was laid in July, 1849, by the late Baron Alderson, and the corner-stone of the Stuart aisle was laid in 1883 by his daughter, the Marchioness of Salisbury.

Market Drayton.—The ancient parish church of St. Mary, Market Drayton, has been reopened, after extensive restoration. Before the restoration the church presented but few signs of antiquity, with the exception of its tower, which stands up boldly on the rocky hill, and the chancel walls. The aisles had been rebuilt as two-story buildings, with great galleries; the clerestory had been rebuilt in a sort of Egyptian style, and all the roofs were low, hipped, and covered with common slates; and the interior, besides the gal-

leries, was filled with high pews in various stages of decay. Very careful examination was made by the architects during the pulling down; all ancient fragments were preserved, and it is asserted that the original design of the church has been recovered with more or less certainty. The church has a broad lofty nave, with north and south aisles extending to the west face of the tower, and chapels, and a large chancel and western tower. The west doorway shows the former existence of a Norman church, and some of the capitals and columns are of the thirteenth century, as in the lower parts of the west and north walls of the north aisle, with portions of its windows, the chapel doorway, and an arched recess. Considerable portions of the chancel walls are also of early date, and on the east gable are the lines of the high-pitched roof. In the fourteenth century the whole of the church was rebuilt, and at the same time the great tower was erected. The arcades were the older arches, and some capitals with new columns. The south aisle was of the same date, and the chapel and a low clerestory were erected, continued later in the fifteenth or sixteenth century along the chancel, thus forming one long roof line, divided only by the "Sanctus bell" cot (the bell-rope hole of which still exists), near where the roof loft was. In later times there were two, if not three, loftier clerestories built, in order to gain more light for the gallery-encumbered church, leaving that of the chancel. It was, on examination, found that the columns had been pushed down into their own crumbling foundations, and were much out of the perpendicular, and, in fact, only kept up by the gallery beams. These columns have been rebuilt on new solid foundations on the roof, the old stones both of columns and arches being replaced. The clerestory is new; no trace remained of the design of the original one, and the new one is in harmony with the fourteenth-century work, and gives ample light to the church. The north aisle, however, is restored according to some few old stones found, and is an interesting example of the first introduction of tracery in the thirteenth century. In the south aisle stones fixing the mouldings of the windows and doorways were found, and have fixed the type as that of the best period of the fourteenth century. There were originally north and south porches, where the remains of doorways exist. It was impossible, by reason of the interments, to rebuild them. The chancel wall windows are of the fourteenth century. It was then lengthened beyond the original eastern line, and the piscina was moved and refixed. A few remains existed of the old oak roof,—viz., a richly-moulded tie-beam of the early high-pitch roof, and some fragments of the latter roof. The mouldings of these last have been adopted in the new chancel roof. All the roofs are of oak, covered with lead. That of the chancel is more richly treated than the others, to be in harmony with the clerestory. The timbers are carried on carved angels with outspread wings. The large old windows of the chancel are filled with new tracery; those of the clerestory are repaired only, and new parapets have been erected and such portions only of the walls rebuilt as were necessary. The whole church is lined inside with red stone, as is the outside, the inside facing of the nave being the old, replaced stone for stone. Much of the facing of the north aisle has simply been cleaned and repaired. During the work many old tiles were found *in situ*. The new broad central pattern tiles and the Agnus Dei tiles of the altar dais are reproduced by Messrs. Minton from the ancient ones, a few of which are relied behind the altar. The low screen wall has alabaster tracery panels set in Runcom stone. The pulpit will be of similar material. The chapels are, as formerly, parted off from the chancel by traceried oak screens. The steps of the altar are of polished Hopton Wood stone, and the re-table wall has shelves of marble and alabaster. Some few of the seats in oak have been placed especially in the Buntingdale Chapel, restored at the expense of Mr. Tayleur. Many windows are filled with stained glass by Messrs. Burlison & Grylls, the subjects following one general scheme for the whole church. A new vestry is to be added at the north-east end, and entered from the chancel. The tower is still in need of repair. There was originally intended to be a stone spire rising from the inside of the parapets. The particulars and details of this tower are exceedingly good, and its three arches in the

church have a very fine effect. The architects under whose care the work has been done are Mr. R. Herbert Carpenter and Mr. B. Ingelow, of Carlton-chambers, London. Mr. Bowdler, of Shrewsbury, contracted for the nave and aisles as well as the Buntingdale and Broughton chapels. Mr. Yates, of Shiffnal, was the contractor for the chancel, Mr. Fletcher being the clerk of the works. A heating apparatus on the hot-water system has been supplied, and the church has been efficiently lighted with gas by Mr. Gower, of Market Drayton. The work was commenced on the 1st of August, 1881, and has been completed at a cost of about 5,600*l.*, exclusive of the chancel and Buntingdale chapel.

MEETINGS.

SATURDAY, MARCH 1.

Association of Public Sanitary Inspectors.—Discussion on papers read at previous meetings, and (time permitting) paper to be read by Mr. Thos. Kees, of Guildford, on "The Public Health Act, 1875." 6 p.m.
Royal Institution.—Capelin Abney, R.E., F.R.S., on "Photographic Action considered as the Work of Radiation." 8 p.m.

MONDAY, MARCH 3.

Royal Institute of British Architects.—Special General Meeting of Members only. 8 p.m.
Royal Academy.—Mr. E. J. Foynter, R.A., on "Sculpture." 8 p.m.
London Institution.—Mr. Arthur Severn on "Beach Studies." 8 p.m.
Society of Arts.—Mr. R. W. Edis, F.R.S., on "The Fittings, Planned Furniture, and Constructive Decoration of Town Houses." (Cantor Lecture.) 8 p.m.
Society of Engineers.—Mr. A. C. Egert on "The Defects of Steam Boilers and their Remedies." 7.30 p.m.

TUESDAY, MARCH 4.

Institution of Civil Engineers.—Discussion on Mr. S. W. Barnaby's Paper on "Hydraulic Propulsion." 8 p.m.

WEDNESDAY, MARCH 5.

Society of Arts.—Mr. W. H. Preece, F.R.S., on "The Progress of Electric Lighting." 8 p.m.
British Archaeological Association.—Mr. H. Syer-Cuming, F.R.S. Scot., on "Finger-Nail Lotion." 8 p.m.

THURSDAY, MARCH 6.

Society of Antiquaries.—Ballot for the election of Fellows. 8.30 p.m.
Society of Engineers.—Mr. J. W. Wilson on "The Work of the Fitting, Erecting, and Smiths' Shops." 8 p.m.
Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigators." 8 p.m.
London Institution.—Professor Schuster, F.R.S., on "The Aurora Borealis." 7 p.m.

SATURDAY, MARCH 8.

Architectural Association.—Visit to the Brompton Oratory. 3 p.m.

Miscellaneous.

Royal Victoria Coffee Hall.—The Gilchrist Trustees have enabled the Committee of the Victoria Hall to arrange for the delivery of a second course of penny science lectures on Tuesday evenings, beginning March 4th. The following is the list of subjects:—March 4, Professor H. G. Seeley, F.R.S., on "Ancient English Dragons"; March 11, Wm. Lant Carpenter, Esq., B.A., B.Sc., F.C.S., on "Air, and why we breathe," with experiments; March 18, P. H. Carpenter, Esq., M.A., D.Sc., on "Fossils, and what they teach us"; March 25, Edward Clodd, Esq., on "The Working Man 100,000 years ago"; April 1, E. B. Knobel, Esq., F.R.A.S., F.G.S., Hon. Sec. R.A.S., on "The Planets"; April 8, J. W. Groves, Esq., on "The Dangers and Safeguards of Beauty in Animals."

Prevention and Extinction of Fires in Theatres.—The Council of the Society of Arts, having considered the models, plans, drawings, &c., submitted in competition for the Fothergill prize of a gold medal, or 20*l.*, offered for the best invention having for its object the prevention and extinction of fires in theatres, have determined that the papers by Captain Shean and Mr. Ernest A. E. Woodrow, A.R.I.B.A., on arrangements for the prevention and extinction of fires in theatres, are the best of all the contributions sent in; but they are of opinion that neither of these papers comes within the terms of the offer of the prize. They have, therefore, decided not to award the prize.—*City Press.*

Seascale.—With reference to this place, a seaside resort situate on the Furness line in Cumberland, we hear that an additional impetus is about to be given to its development. During the few years it has been frequented as a watering-place, satisfactory progress has been made in providing the necessary accommodation in the way of buildings. A new and large permanent church is about to be erected in place of the iron edifice which came to a tragic end during the prevalence of the late storms.

British Archaeological Association.—The sixth meeting of the session was held on the 20th ult., the Rev. Dr. Sparrow Simpson, F.S.A., in the chair. A series of portable shrines, with figures of saints of the Russo-Greek Church, was exhibited by Mr. Loftus Brock, F.S.A. An impression of a little-known counter-seal of Philip, Duke of Burgundy, 1419-1467, was described by Mr. A. B. Wyon. Some recent finds on the site of the new buildings in Coventry-street were shown by Mr. G. Lambert, F.S.A. Mr. Romilly Allen tendered a description of the slab, covered with Saxon interlaced ornament, found not long since during the restoration of Bexhill Church. The Rev. S. M. Mayhew exhibited a collection of antiquities found recently in various parts of London. A paper was read by the chairman on a Magic Roll in the British Museum. The roll is of vellum, 11 ft. in length, and but 1½ in. in width, of the early part of the seventeenth century. One side is covered with neatly-drawn sigils, the other with a wild jumble of meaningless words and names in Latin, invocations of spirits, signs of the Cross, charms, prayers, and passages from the Bible. In the discussion which ensued, Mr. T. Morgan, F.S.A., referred to the prevalence of old superstitions in various parts of the British Isles; and Mr. de Gray Birch, F.S.A., indicated the presence of a well-known but unexplained arrangement of five letters in five lines as occurring not only on the magic roll, but on the end of a pew in Great Gidding Church, 1614, and also on a Roman tile found at Cirencester. The proceedings were brought to a close by a paper on "The History of Devizes Castle," by Mr. W. H. Butcher, who traced the notices of the famous building from early times to its demolition during the Civil Wars.

General Engineering Construction.—The second of a course of lectures on General Engineering Construction, by Mr. J. W. Wilson, Assoc.-M.I.C.E., vice-principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of February 21, in the reading-room of the Society of Engineers, Victoria-street, Westminster. Mr. A. T. Walmisley, member of council, in the chair. The lecturer commenced by impressing upon his audience the value of a good practical acquaintance with all the details of professional work, and then proceeded to consider various points of interest bearing upon the nature and proper employment of the different implements and materials in use in the engineering drawing office. After dealing with the preparation of working and finished drawings, tracings, &c., he proceeded to emphasize the value of freehand sketching, and the correct figuring of dimensions. He then showed the advantages of calculation as a necessary aid to engineering design; and, after explaining the getting out of quantities in reference to the preparation of estimates of various kinds, he considered the general nature of specifications, explaining in detail some of their more important clauses, touching upon the plotting of parliamentary and other surveys. He concluded by showing the use of reliable drawings and specifications to the superintendent of work in construction.

Blaydon-on-Tyne.—Acting under the instructions of Mr. Frank Parmeter, the newly-appointed Receiver of a portion of the Towneley Estates, Mr. T. C. Nicholson, architect, of Newcastle-on-Tyne, has just prepared a plan for extensive building operations at Blaydon-on-Tyne. The plan indicates twelve acres of land laid out for freehold building sites. The front streets marked out on the plan will be 36 ft. in width, a width of 18 ft. being allowed for the back streets. All the houses will be self-contained, and will have large yards behind. We are informed that for some years past there has been a great and increasing demand for houses in the Blaydon district; but, with the exception of the ground laid out by Sir Henry Clavering, there has been no freehold land in the market; and this circumstance led to the decision to mark out this portion of the Towneley Estate for building sites. Should the twelve acres already planned not be sufficient to meet the demand for house property,—and with the rapidly increasing population of the district the demand is likely to continue,—other portions of the estate will also be offered to builders. The streets will be, as it were, enclosed on two sides, being bounded on the east by Shibdon Dene, a wooded ravine; and on the west by Blaydon Bank, a deep cutting.

TENDERS.

For sea defence works at Hove, Sussex. Sir John Coode and Mr. Ellice-Clark, engineers:—

	Time
Budden & Co., Gloucester	£38,839 12 7 ... 18 months.
W. Webster, London	33,723 0 0 ... 23 "
J. Harrison, Brighton	30,966 0 0 ... 20 "
J. T. Chappell, Pimlico	29,861 0 0 ... 24 "
C. Dickinson, London	27,515 0 0 ... 15 "
W. J. Doherty, Dublin	27,321 0 0 ... 15 "
McCrea & McFarlane, Belfast	26,659 12 7 ... 18 "
G. Lawson, Glasgow	26,272 4 10 ... 20 "
G. Cheesman & Co., Brighton	25,904 0 0 ... 24 "
H. Lee & Sons, Westminster	25,720 0 0 ... 24 "
J. G. Marshall, Brighton	25,671 4 4 ... 17 "
J. Longley, Crawley	25,189 0 0 ... 24 "
W. Hill & Co., Gosport	23,946 0 0 ... 12 "
Taylor & Sharp, London	23,000 0 0 ... 12 "
Hill Bros., Wycombe	20,943 11 4 ... 10 "

* Accepted.

For connecting sewers and flushing tanks at Hove. Mr. Ellice-Clark, engineer:—

Ascombe, Brighton	£4,872 0 0
Buttrill, London	4,601 0 0
Dearle, Hastings	4,401 0 0
Meahill, Brighton	4,330 0 0
Cowdery	4,086 0 0
Hill & Co., Gosport	4,116 0 0
Peters, Hoveham	3,945 0 0
Cheesman & Co., Brighton	3,840 0 0
J. H. Etheridge, Croydon	3,804 0 0
Reynolds, Jun., Hove	3,497 0 0
Longley, Crawley	3,272 0 0
Farnson, Hove (accepted)	3,107 0 0

For alterations, repairs, and decorations to the Vestry Offices and Lammas Hall, Battersea, for the churchwardens and overseers. Mr. H. G. Gribble, architect. Quantities supplied:—

Hudson, St. John's Hill	£335 0 0
E. Mapleden, Battersea Rise	238 0 0
Turtle & Appleton, St. John's Hill	234 0 0
T. Walker, Battersea (accepted)	190 0 0

For the erection of a warehouse in Bath-place, Haggerston, for Messrs. Lines Bros., Messrs. J. & J. S. Edmonston, architects, 42, Old Broad-street, London:—

Adamson & Sons	£3,320 0 0
Cadman & Bundy	2,250 0 0
Sailey & Son	2,249 0 0
Marshall	2,232 0 0
Frost	2,240 0 0
Holding	2,187 0 0
Nye	2,168 0 0
Smith & Son	2,147 0 0
Staines & Son	2,144 0 0
Kirk & Randall	2,120 0 0
Brown	2,090 0 0
Gould & Brand	2,087 0 0
Holland	2,013 0 0
Shepherd	2,037 0 0
Boycé	1,655 0 0
Steel Bros.	1,999 0 0
Jarvis & Son	1,995 0 0
Ward & Lambie	1,981 0 0
Jackson & Todd	1,918 0 0
Higgs	1,935 0 0
J. Harper (accepted)	1,930 0 0

For the erection of Unitarian Chapel, Newark. Mr. Geo. Sheppard, architect, Newark:—

T. Coaham	£1,180 0 0
T. Henderson	1,145 0 0
MacKenzie & Son	1,141 0 0
C. Threlks & Son	1,080 0 0
C. Lane	1,025 0 0
Smith & Lunn	967 0 0
Brown & Son	960 0 0
M. Duke	985 0 0

[All of Newark.]

For alterations, repairs, and rebuilding party wall at No. 1, St. Stephen-street, Bristol, for Mr. Frederick W. Sincock. Messrs. J. W. Trev & Sons, architects, Broad-street:—

	Repairs.	New Party Wall.
Highman	£954	£151
E. Gay	700	150
W. Cowlin	673	190
H. Johnson	670	113
T. & E. Hatherley	647	147
J. Bastow	630	115
J. James (accepted)	489	—

[All of Bristol.]

For new Wesleyan chapel and schools, Reigate. Mr. F. Boreham, architect. Quantities by Mr. C. W. Brooks:—

Sawyer	£3,553 0 0
Roberts Bros.	3,497 0 0
Taylor Bros.	3,483 0 0
Dove Bros.	3,475 0 0
Buckland	3,453 0 0
Holt	3,260 0 0
Redford & Potter	3,100 0 0
Woodward	3,060 0 0
Apted Bros.	2,940 0 0
Holloway	2,880 0 0
Nightingale Bros. (accepted)	2,803 0 0

For the erection and completion of an engine-house and boiler-house at the waterworks at Boulham, Lincoln. Mr. Tenge, engineer. Quantities supplied:—

Cowen & Lansdowne	£2,448 0 0
J. B. Harrison	2,343 0 0
E. & R. Horton	2,304 0 0
H. S. & W. Cline	2,294 0 0
J. M. Harrison	2,246 0 0
Crosby & Sons	2,219 0 0
Wright (accepted)	2,085 0 0

[Engineer's estimate about 2,600*l.*]

For pulling down and rebuilding Nos. 143 and 145 Green-street, Bethnal Green, for Mr. Leffer. Mr. W. Batten, architect. Quantities supplied:—

Russell	£988 0 0
Thomerson & Son	865 10 0
Beale	860 10 0

For proposed assembly room and other buildings at Malvern, in the county of Worcester, for the Directors of the Malvern Pleasure Garden Company. Mr. John Johnson, architect, Queen Victoria-street. Quantities supplied by Mr. William H. Pipe:—

Main Buildings.	
Alfred King, Gloucester	£12,487 0 0
Brown & Co., London	10,800 0 0
Wood & Sons, Malvern	10,797 0 0
Allen & Son, Kilburn	10,570 0 0
Kingsley, Banbury	9,595 0 0
Bradley, Wolverhampton	9,994 0 0
Foster & Dickers, Rugby	9,660 0 0
Averal & Co., Graham House, Malvern	9,969 0 0
Ironwork.	
Phoenix Iron Foundry	£1,287 0 0
Sparkes & Co., Great Malvern	1,217 0 0
Handyside, Derby	1,027 0 0
Tidley, Stafford	941 0 0
Dawson, London	920 0 0

For alterations and additions to St. Catherine's Lodge, Hove. Mr. Wm. Flockhart (Messrs. Wallace & Flockhart), 27A, Old Bond-street, architect. Quantities by Mr. Frederick Thomson, London:—

Goldard & Sons, Farnham	£4,437 0 0
C. E. Kempe, Brighton	4,197 0 0
J. Anscombe, Brighton	3,836 0 0
Howard & Co., Brighton	3,674 0 0
Parsons & Sons, Hove	3,645 11 10
Dowling & Sons, London	3,370 0 0
Light, Portsmouth	3,198 0 0
Feters, Hove	3,103 0 0
E. Toms, London	3,043 0 0
W. Taylor, Brighton	3,028 0 0
Webster & Sons, Hove	2,887 0 0
Keynolds, Hove	2,837 0 0
P. S. Robertson, London	2,813 0 0

For alterations, &c., at Nos. 175 and 178, New Bond-street. Messrs. Allen & Mackland, architects. No quantities:—

Yardley	£1,099 10 0
Drew & Cadman	1,773 0 0
White & Winter	1,052 0 0

For rebuilding the Crown public-house, Whitecross-street, E.C., for Mr. G. W. T. Farthing, architect. Quantities supplied:—

Pickersgill	£1,283 0 0
Royal	1,176 0 0
Mills	1,147 0 0
Spencer & Co.	1,140 0 0
Jonelyne	1,072 0 0
Jackson & Todd	1,029 0 0
Burch & Co.	891 0 0

For alterations and additions to 36, 38, 40, and 42, Chiswick-street, and No. 4, Tolly-street, Poplar, for Mr. Orenham. Mr. J. Douglas Mathews, architect. Quantities supplied:—

Nightingale	£2,893 0 0
Mild	2,887 0 0
Smith	2,884 0 0
Coleman	2,890 0 0
Grover	2,787 0 0
Atherton & Latta	2,780 0 0
Heavle & Son	2,492 0 0
Kilby & Co.	2,436 0 0

For additions to The Old House, Wimbledon. Mr. Edgar Farman, architect, 5, Great James-street, W.C.:—
Henry Harmer (accepted) £285 0 0 |

[No competition.]

For alterations, &c., 13 and 14, Lee-place, Lee. Mr. Frederick Lee, surveyor:—
H. Hughes £202 18 0 || J. B. Gerrans (accepted) | 189 19 0 |

For the erection of a cottage at the back of No. 3, Paragon, Ramsgate, for Mr. W. H. Dunn, Mr. E. L. Elgar, architect:—

J. Newby	£267 9 0
Newby Bros.	489 0 0
W. H. Port	493 0 0
B. J. Corwell	475 0 0
H. Bowman (accepted)	424 0 0
H. Miller	435 0 0

For shops, stabling, &c., at Surbiton. Mr. R. T. Beaumont, architect:—

R. Scase & Son, Surbiton	£2,196 0 0
G. F. Havel, Kingston and Lee	1,893 0 0
Babbs Bros., Surbiton (accepted)	1,843 0 0

For villa residence, St. Peter's Park, St. Alban's. Mr. T. Foster Woodman, Surveyor, St. Alban's and Hemel Hempstead:—
Messrs. J. & W. Savage £550 10 0 |

For stabling and class-room over, in the Lower Cross-road, Hemel Hempstead, for Mr. H. Mutton. S. Foster Woodman, surveyor:—
Horn £180 0 0 |

For new shop front and roof, and general repairs, to No. 25, Chequer-street, St. Alban's, for Mr. B. C. Martyn. Mr. S. Foster Woodman, surveyor:—
Messrs. J. & W. Savage £245 0 0 |

* Tender for amended design.

For the erection of a pair of villas, Parrock-road, Gravesend, for Messrs. T. G. & G. Sandford. Mr. Edmund J. Bennett, architect, Gravesend:—
W. H. Archer (accepted) £1,054 0 0 |

Baptist Chapel, &c., Weller-road, Putney.—Mr. J. D. Hobson, of Duke-street, Adelphi, writes to say that his tender for these works ought not to have been included in the list sent to us for insertion last week (see p. 288), as he withdrew it by telegram, having discovered a clerical error of £900 after the tender was sent in; so that instead of £4,462, its amount should have been £3,562.

New Schools for Edmonton Union.—With reference to the list of tenders for this job, printed by us last week (p. 27), Messrs. Foster & D. class write:—"We are informed by Mr. Knightley that Mr. Wall's tender was accepted because it was decided by the Guardians to carry out the work in accordance with the alternative estimate, for which our amount was a few pounds above his. We mention this fact, as otherwise it might almost appear from the list that our tender had been passed over in favour of Mr. Wall's."

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 40, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

W. R. D. (we cannot inform you, and we cannot print inquiries on subjects of that kind.)—K. B. and E. H. (we have no space present, we fear. Cannot print half the letters we wish to.)—Nemo (ditto). According to your account, the architect's charge was based on bad and rather disingenuous reasoning, but you are quite mistaken in thinking your friend victimized. A small building costs far more trouble in proportion to the other than a large one, and it is quite common and quite fair to charge at a higher rate for it, but of course an architect should tell his client so beforehand.—J. (we cannot print letters unless names and address accompany them).—W. S.—W. P. E. (next week).

Correspondents should address the Editor, and not the Publisher, except in case of business.

All statements of fact, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications beyond mere news-items which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 12, and a COLLECTOR'S TITLE-PAGE was issued the following week, in substitution for that published previously.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Clubs), with straps, to hold a Month's Numbers, price 2s. each; also

THE FORTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

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PERSONS Advertising in "The Builder," may have Replies addressed to the Office, 46, Catherine-street, Covent-garden, W.C.

Free of Charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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Illustrated Pamphlet on "Heating" post free.

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N.B.—For Prospectuses and Diagrams, address Stamped Envelope to

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NOTICE.—THE POLYGONAL REFLECTOR (Latest Patent) FOR ARTISTIC AND PICTURE GALLERIES.

Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.

The Builder.

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SATURDAY, MARCH 8 1914

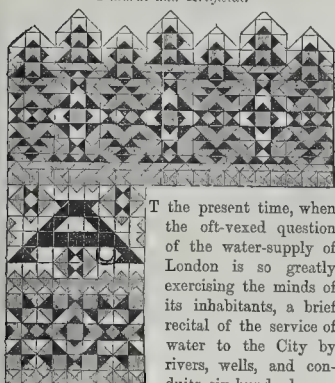
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London's Medieval Water Supply. Natural and Artificial.



At the present time, when the oft-voiced question of the water-supply of London is so greatly exercising the minds of its inhabitants, a brief recital of the service of water to the City by rivers, wells, and conduits six hundred years

ago and more, may not be altogether uninteresting.

Until nearly two centuries and a half after the Norman Conquest, London derived its supplies of water from the Thames; "The River of Wells, as it was then called, on the west; with water called Walbrooke running through the midst of the Citie into the River of Thames,—serving the heart thereof,—and with a fourth Water or Bourne, which run within the Citie through Langbourne Ward, watering that part in the east. In the west was also another great water, called Old-bourne." So writes Stow, blending, as he sometimes does, tradition and fact.

The Wall-brook, of which the Romans drank and on whose banks they built their villas, rose to the north of London beyond the present site of Moorfields and Finsbury-square on the Moor of "Haliwelle and Vynesbery," and, at a later date, called Finsbury Fields. Probably more than one brook supplied the rivulet. After minute investigation by those well-known archaeologists, John E. Price and Alfred White, it appears that the eastern tributary rose near the south end of the New North-road in the direction of Pitfield-street, Hoxton; thence, by Willow-walk, across the Curtain-road, by King John's-court, to Holywell-lane, and followed a course east of the entire length of Long-alley; thence, by the old burial-ground of Bethlehem Hospital and along Blomfield-street, to the west of the churchyard of All Hallows, London Wall, where it entered the ditch of the City wall. Leaving the ditch at the top of Little Bell-alley, with a sharp turn by St. Margaret's, Lottbury, it crossed what is now Princes-street, and pursued its course Thameswards beneath Grocers' Hall and St. Mildred's Court.

The Wall-brook was mentioned in a charter of William I. to the College of St. Martin-le-Grand, the site of which is partly occupied by the General Post-office:—"To the church of the Blessed Martin, situated within the walls of London, I give and grant to the said church for the redemption of the souls of my father and mother, all the land and moor outside the postern called Cripes-gate, on either side of the postern, to wit, from the northern angle of the City wall, where a river of wells marks it out, as far as the running water [*aquam currentem*] which enters the City." The course of the "running water" inside the wall was an important boundary-mark in the early years of the City. In the "Liber Albus" it is written that when a person is bound to clear himself by the Great Law,—the law appertaining to homicide and murder,—he shall select thirty-six jurors, eighteen to be chosen from the east side of the "Walebrooke" and eighteen from the west, &c. The brook divided the twelve eastern from the twelve western Wards of the City, whose rulers jealously tried to guard it from pollution by many strict ordinances. Every householder on the banks of the brook, from the Moor to the Thames, was bound by law to keep a rake for the purpose of intercepting any refuse thrown into it. In the City Records such entries as "That the course of the Wall-brook shall be cleansed," "That certain men be sworn to keep the water-course of Wall-brook," are of frequent occurrence. At an inquisition before the Mayor in 1300, it was decided that the parishioners of St. Stephen's are bound to repair the covering over the water-course of "Walebroc." So many coverings and bridges were placed over the brook that at last it was hidden from sight and degraded into a common sewer. Stow writes:—"It hath been a common speech [tradition?] that, when the Wallbrook did lie open, barges were rowed out of the Thames and towed up as far as Bucklesbury, after one Buckle, who there dwelt and kept his courts." (†)

That the water of the Thames was used for domestic purposes in early times is shown by the corner's roll, under date June 17th, 1276, when an inquest was held on Henry Greene, a water-carrier, who was found dead in the river. The evidence showed that Henry, having come to St. Paul's Wharf, with a tankard, and intending to take water with it, entered a boat, and having filled the tankard attempted to place it on the wharf, and in so doing the boat moved away and he fell into the water. The tankards used then, and for centuries after, by the London water-carriers contained about three gallons, were hooped, and shaped like the frustum of a cone, with an iron handle and a bung at the upper end.

A number of families used the Thames water, "fetching it by the many lanes which led to the water-side, but in time many of these were stopt up by those that dwelt thereabouts, for their own gain, who would suffer none to pass without paying a duty." Among the closed lanes and bridges were Fish Wharf-lane, where Simon of Twynham took custom; Armentere's-lane, where there was a convenient bridge, was blocked up by a cook-shop; and Dovesgate-lane, where they had made buildings consisting of divers houses of office, and filth fell on the passers-by, to the disgrace of the commonalty. In the time of Edward III. there was a bridge in Timberhythe, to the west of Queenhythe, which was common to all the citizens for the purpose of washing clothes and taking supplies of water. It was named "Laundresbrigg." In 1326, according to the French Chronicle of London, which was compiled in the earlier half of the fourteenth century, "For want of fresh water, the tide from the sea prevailed to such a degree that the water of the Thames was salt, so much so that many folks complained of the ale being salt."

A portion of the River of Wells may still be seen by the wanderer on the slopes between Hampstead and Highgate, flowing with tiny current from its only remaining fountain-head in Caen Wood, pure and sparkling, to become, on reaching Kentish-town, a polluted ditch, and then a common sewer, on the remainder of its journey to the Thames. In the long past years this stream, from the hill-slopes to the river, supplied the dwellers on its banks with drinking-water; but its lower portion, even at so remote a date as 1290, was so tainted with impurities that the prior of the House of Carmelites (the Priory of Whitefriars*) complained to the king of the noxious exhalations arising from the Fleet river, which were so abominable that many of the brethren died of miasma, and its fetid odours overpowered the incense burned at their altars. The Fleet river was strangely treated by the civic authorities. In 1343, "for the decency and cleanliness of the city," a lease was granted to the butchers in the parish of St. Nicholas Shambles,† London, of a piece of land in the lane called "Secollane," "near to the water of Flete, for the purpose there, in such water, cleansing the entrails of beasts." In fourteen years afterwards, "for avoiding the filthiness that is increasing in the water, not only of the Fleet, but of the Thames, to the great abomination and damage of the people,‡ it was ordered that

* See *Builder*, vol. xlv., p. 7, "The Priory of Whitefriars," &c.

† The Church of St. Nicholas ad Masellum, or the Shambles (destroyed when Christ Church was made parochial), stood in Fentrest-lane, Newgate-street.

‡ In seven years came the "Pestilence, that so wasted and spoyled the people, that scarce the tenth persons of all sorts were left alive."—Stow's "Annals."

* The Hospital of Thomas of Acres, or Acorn, was founded in the reign of Henry II. It was built on the site of the house in which Thomas a Becket was born. Before the site has been occupied by the mercers as a dwelling and hall. The bell of St. Thomas rang Prime 6 a.m.; that of St. Martin's le-Grand, Curfew.

+ The Beckerles, or Bucklerles, an ancient and wealthy family, had a mansion in Walbrook, the "tenement of Bokerlesberie." Hence Bucklerbury. They were of Italian descent, originally from Bocerilli.

+ In 680, the king of Northumberland, drained cups of gold or iron to be fastened beside the clear wells and fountains by the wayside, "for the refreshing of wayfarers men."

years, 11s. 8d.; Thomas Beater, two years, 11s. 8d.; Roger, the brewer, at the Maiden in the Hoop (one year empty), 6s. 8d.; John Goby in the Poultry, one year, 6s. 8d.; Roger at the Brook (Wallbrook), for the first year, 6s. 8d.; Dame Cecily, Wrastlingworthe, for one year, 6s., &c. Among the defaulters for this year,—in the Poultry, John Goby; in Chepe, Roger at the Brook; the assessments varying from 6s. to 6s. 8d. To this list of assessments is subjoined a return of the money, 11l. 15s. 4d., received from tankards of persons who are unknown (?), and of the expenses for repairing the fountain-head when it was slandered for poison (esclandre de poyson). This return is interesting on account of the information it affords concerning wages at the time. For bringing the pipe of the conduit into the mews, three men working for three days, each man 8d. per day, 6s.; for ale given to them, 6d. . . . For mending and covering the pipe at the fountain-head in the high road, four men for two days, each man 6d., 4s.; paid them 4d. each day for drink, 8d. The sums allowed for drink-money seem excessive, as the best ale was sold for 1½d., and the small ale for 1d. per gallon. "For hire of a man and his cart for two days, at 2s. per day, 4s." Much employment seems to have been had for carts in those days; indeed, so important were they that they were legislated for in an Act of Edward I., whereby to prevent streets and roads being unnecessarily cut up by carts, it was ordered that no cart serving the City with wood, sand, or stone, should be shod with iron,—that is, have iron strikes or rims on the wheels. The water supplied to the citizens from the Thames was carted at certain specified rates. For a cart carrying water from Dowgate or Castle Baynard to Chepe, 1½d.; if beyond, 2d.; if not so far, 1½d., and, well worthy of remark, all carts when unloaded were, for the safety of the public, to be driven no faster through the City than when laden. In the same reign it was proclaimed "that the gallon of conduit-water weighs ten pounds four shillings by the ordinary weight, and the gallon of Thames water ten pounds sixteen pence by the same weight."

As the years went on the misdoings of the brewers and others increased, until they reached a climax. In 1415 complaint is made to the authorities that the brewers next to the Great Conduit in Chepe, and others, have rented the fountains, and the great upper pipe of the conduit, and are drawing water for their brewing out of the small pipes below. The "renders" are ordered not to draw from the same pipes under a penalty of 6s. 8d. for each offence. In 404 a fine of a pound of gold was imposed for every ounce of water taken away surreptitiously from the public fountains of Constantinople.

Pipes were as liable to burst then as now. In 1388 the good men of the neighbourhood of Fleet-street complained to the City authorities that very many losses and grievances had oftentimes befallen them through inundations from "the London aqueduct," the name given to the pipes which conducted the water from Tyburn to the Great Conduit, and further stated that these inundations rotted and damaged their houses and cellars and the party-wall¹ thereof, as also their goods and wares. The good men were granted the great privilege of erecting, at their own cost, a pent-house (pinnaculum) over the aqueduct, which perhaps may have been exposed, for the pipes were in some places above ground, as may be seen by the occasional disbursements of money for "mending and covering the pipe." This pent-house was erected opposite the house and tavern of John Walworth, vintner, near to the hostel of the Bishop of Salisbury, which stood on the site of the present Salisbury-court, Fleet-street.

In 1390 the substantial men of the ward of "Fardone" Within, and other citizens, intended,

at their own cost, to build a conduit near to the Church of St. Michael le Quern to be supplied by the great pipe of the conduit opposite to St. Thomas of Acon, and leave was granted to the reputable men so to do, provided that the work should not be injurious to the Great Conduit. In Wilkinson's "London before the Fire" a view is given of the church and "ye lytle cundit," as they appeared in 1585. In this view three pipes are represented coming from Paternoster-row; one enters the conduit, two pass along Cheapside, and of these, one diverges to the north opposite Foster-lane, and one passes on in the direction of the Great Conduit. Fourteen flagons or tankards are ranged in front of the Little Conduit.

The first enterprising Londoner who introduced conduit water to his premises was a tradesman of Fleet-street. In a record of 1478, it is mentioned that "a wex-chandler in Flete-streth had bi crafte perced a pipe of the conduit withynne the ground, and so conveyed the water into his selar; wherefore he was judged to ride through the cite with a conduit upon his hedde," and the City Crier was to walk before him proclaiming his offence.

John Lydgate wrote two long poems to celebrate the return of Henry V. from his victory at Agincourt in 1415. In one he sings:—

"Men and women, for joye they alle
Of his comyn they weren so faine,
That the Condyds both grete and malle
Ran wyth ich one as y herode sayn."

After serving the City for upwards of two centuries, the Great Conduit began to show symptoms of decay, and was taken down and rebuilt in 1479. Long before this date many conduits, fed from other fountain-heads than the springs at Tyburn, had arisen in various parts of the City and suburbs, but the conduit "opposite to St. Thomas of Acon" was still the Great Conduit. For centuries it had, on the occasions when the City held high festival, poured forth wine, red and white, for all comers and had listened to the "noise of musick" and addresses full of loyalty and bombast, and had been "beautified with pictures and sentences." Its last appearance in Court dress was in 1662, when King Charles entered London. On the top of the Great Conduit at the entrance of Cheap was another fountain, out of which issued both wine and water, as in representation of Temperance, and on the several towers of that conduit were eight figures," &c. So writes John Ogilby.

The Great Conduit perished in the Fire. Samuel Rolle "commented and improved" on the Burning of 1666 in "CX. discourses." In one of these he speaks in tones of lament,— "Methinks the several conduits that were in London stood like so many little (but strong) forts, to confront and give check to that great enemy, Fire, if any occasion should be. . . . What a pity it is to see those breasts of London (for so I may also call them) almost dried up. They were lovely streams indeed which did refresh that noble city, one of which was always at work pouring out itself when the rest lay still. As if the Fire had been angry with the poor old tankard-bearers, both men and women, for propagating that element which was contrary to it, and carrying it upon their shoulders as it were in state and triumph; it hath even destroyed their trade, and threatened to make them perish by fire who had wont to live by water."

With the destruction of the Great Conduit, which was not rebuilt after the Fire, its story ends.

The Association of Municipal and Sanitary Engineers and Surveyors.—A home counties' district meeting will be held at Brighton on Saturday, the 15th inst., when, after the transaction of other business, the following paper will be discussed,—*"The Supervision of Private Buildings by Public Authority,"* by Mr. Ellice-Clark. The following Paper will be read and discussed:—*"Jointing Sewer Pipes,"* by Mr. H. P. Boulnois, Borough Engineer, Portsmouth. The members will afterwards proceed to view the Sea Defence Works at Hove and Brighton, now in progress; also the Brighton Intercepting Sewer Ventilating Furnace.

STUDENTS' DESIGNS AT THE INSTITUTE.

THE drawings sent in competition for the Soane Medallion, the Tite Prize, and the Institute Silver Medal, which have been hung in the rooms of the Institute during part of this week, are, on the whole, above the average of merit. The names of the prize-winners are given categorically elsewhere. It is noticeable that among the eight who have obtained recognition, four are provincial men,—a fact which seems to indicate that students residing in the provinces are not, after all, so disadvantageously placed in comparison with those in London, as has sometimes been suggested.

The subject of the Soane Medallion was a Theological College; and, considering the usual association of Gothic architecture with the Church, it is not surprising that all the competitors, except one, have chosen to be more or less Gothic in style. The design by Mr. J. O. Harris, which has obtained the first place, unquestionably deserves its position as far as design and drawing are concerned. The author has adopted a Late Gothic style, English in feeling, and suggestive in its general features, especially in the turreted gateway, of what Oxford and Cambridge have led us to think of as specially associated with collegiate architecture. The general perspective makes an effective group, and is a fine drawing; the tower, which is inevitable in all competition designs, is got in so as to have some relation of proximity with the chapel, and consequently a certain meaning in the design; it is somewhat more prominent and elaborate than is called for in this class of building, the expression of which should be semi-domestic. The author would have done better with his library windows, which are prominent external features, if he had not run them quite up to the cornice mould nor spoiled their scale by the big leaves in the spandrels. The plan is by no means equal to the design, and is, in fact, very faulty. It is on the continuous corridor principle, surrounding a quadrangle, but the space is merely cut up into so many rooms with no consideration of how to make the most of the space. The studies are mostly long, narrow rooms, with a window at one end, the worst form of room for regular study, so far as lighting is concerned; the infirmary is placed so as to command the noise and draughts of two corridors, and with a water-closet opening out of it, without any intervening lobby; indeed, these conveniences crop up everywhere, in the most random and unprincipled fashion. The author has almost the rudiments of planning to learn yet. The design which receives a medal of merit, by Mr. H. O. Cresswell, is a much better plan, and the design, though somewhat commonplace in detail, perhaps owes some of its less attractive effect to a rather heavy style of drawing and colouring; certainly there is far less artistic feeling in the drawing; a less capable hand; but the building looks like what it is meant for, and the chapel is successfully emphasised. The designer of "Marguerite" seems to have been inspired by admiration for the Law Courts and their tower, mingled with a hankering after some of Mr. Norman Shaw's detail; there is a certain force about the design, which is tinted, showing red brick and stone dressings after the prevalent fashion; the ponderous tower is, however, not only out of keeping with collegiate feeling, but marks nothing on the plan except the porter's lodge. A tower should mean something. The plan is arranged on the system common in the Cambridge colleges, with a separate staircase to each breadth of dwellings, instead of continuous corridor communication; an old-fashioned arrangement which, entailing some little inconvenience in moving about, unquestionably keeps a college quieter, more secluded, and more domestic in character than the corridor system. Of the others, the one which shows most sense of the kind of thing wanted, as far as architectural expression is concerned, is "Vera" (the names of the successful authors only are divulged), which is a quiet and semi-domestic building

¹ The shilling of silver weighed three-fifths of an ounce; the silver penny, thirty-two grains of corn from the middle of the ear.

² By Fire Always's Assize, perhaps the earliest English Building Act; for the prevention of fire, party-walls were ordered to be built of free-stones, 3 ft. thick and 16 ft. high.

that could not be taken for anything but a college, not unpicturesque in grouping, though weakly drawn; the plan is youthful and impossible. "Ars longa, vita brevis" is a motto which seems to put forward a pathetic excuse for the extraordinary, and in some places, nearly unintelligible pen-and-ink scribble in which a bird's-eye perspective is shown; the author would have gladly done it in a more finished and intelligible manner; but "vita brevis,"—life is so short! "St. George" shows a careful drawing of a heavy type of Gothic; "Stone" is a Classic building ably drawn, but in very unrefined taste, and with absurd deficiency of window space; "Detur digniori," with nothing special in plan, may be commended for a rather picturesque and effectively treated perspective.

While the suggestions of the subject have thus taken the Soane competitors mostly in the direction of a kind of miniature Gothic revival, the Tite prize, specially intended to encourage the study of "Italian architecture," has also met with an unusually large response; a fact indicating the changed state of architectural feeling among the rising generation of architects, since it was difficult, some little time ago, to obtain any adequate competition for this prize. What was really Sir William Tite's object in the bequest? What did he intend that the competitors should aim at? We suspect his views did not go much further than a conservative desire to fix the attention of students on the style which was accepted in his own younger days as the correct thing, and to stem the tide of Gothic fashion. It is possible, however, to take a larger view than this of the study of Italian architecture; to regard it as the opportunity for developing some of the latent resources of that school of grandiose and stately building which grew up when the Italy of the Renaissance began to fashion the materials of old Rome into a new phase of architecture expressive of the refined and sumptuous, though by no means very earnest, social and artistic spirit of that day. What they did with Roman materials we in turn might strive to do with their materials; and however we may be fascinated, and our imagination kindled, by the romance and aspiration of the Gothic school of architecture, there is no doubt that the school of architecture called, for want of a better name, Italian, is, of all schools that have existed, the one specially expressive of the feelings and tastes of a refined and cultured civilisation; one which keeps the balance between intellectual and social claims. It is not spiritual architecture, certainly; it is not even *spiritual*; but it is eminently the architecture of reason and refinement. Somehow or other the idea of the "hall and staircase of a royal palace" (which was the subject given for the Tite prize) at once suggests to most of us the idea of Classic columns and capitals, of Classic dignity and symmetry, even if the style had not been defined by the conditions in this case. Of the designs sent in by the students for this very interesting and suggestive subject, in which one may be allowed any amount of richness and costliness of treatment irrespective of expense, two are decidedly before all the rest in execution, and one in idea; but that is not the one to which the prize has been given. We understand that the decision of the Council in the matter has been a good deal questioned already. It is more than a question; there is no doubt whatever that a mistake has been made. The drawings of Mr. Poley, to which the prize has been awarded, are beautifully finished; the perspective view of the whole, drawn carefully in line with no adventitious aids of shading, is an admirable specimen of clear clean drawing. But this draughtsmanship is expended on a design of little originality, and which would be effective in execution from its size and richness of detail rather than from any special qualities of design as a whole. Mr. Campbell's design, to which the medal of merit has been awarded, is, on the other hand, really an arrangement of considerable effectiveness and originality; it is not like any cortile staircase, with columns and a gallery round it; there is considerable ingenuity in the arrangement of the stairs, and very fine effect in the circular

sweep of the hall at the back, with its order of Corinthian columns. It might be thought by some that there is more grandiose effect in the simpler design; but it represents what has been done or drawn so often, whereas in the design placed second there is real originality of a very effective kind. We cannot understand the award at all. Of the other drawings for this prize we cannot say much; in the grateful gloom of the "arbitration room" there was hardly light enough to arbitrate on the drawings that were not near the window; we noticed one entitled "Art," in the Adam style, not without effect, but giving the idea more of a ball-room staircase, a kind of "Almack's," than of a grand palatial entrance; and we do not suppose that Sir W. Tite meant Adam, when he spoke of the "Italian style." He was reverting to "pre-Adamite" days. There is a *cachet* about the style of the Adams, unquestionably; but it is of a light and frivolous order, compared with the dignity and stateliness of the Italian style as it took shape in the Rome, the Florence, and the Venice of the great Renaissance epoch.

The measured drawings from existing buildings, for the Institute Silver Medal and Ten Guineas, are excellent. The first prize has been gained by Mr. Anderson for a very complete and highly-finished set of drawings of Elgin Cathedral; the second by Mr. A. W. Wilson, for an almost equally good set from Walton Church, Norfolk, with its picturesque tower standing apart at the entrance to the churchyard. Among the unawarded, "Spes" sends a good set of drawings of St. Leonard's, Middleton, Lancashire, a long low church, with a wooden upper stage on its squat tower; the perspective sketch is bold and effective in style. It is, however, much easier work, takes less out of a man (and, consequently, gives less indication of what is in him), to do even elaborate measured drawings than to produce an original design; and, except for permanent publication, it is possible to over-rate the value of this patient elaboration of measuring and sketching, which is like the eternal stippling in certain schools of art. We would rather have seen a good set of competitors for the Grissell Medal, for which there was no competition at all, than for this measuring and sketching work. We want architects to be builders, not mere draughtsmen; and the neglect of the Grissell Medal, which involves practical constructive work, as well as the decided superiority of drawing over plan in the Soane competition, shows that the tendency is not sufficiently in this direction.

NOTES.

THE frequent attacks upon the late Mr. Street's great work appear to bring up but few apologists. There is, perhaps, much which does not admit of apology; but it is only fair that he should not be condemned in matters wherein he was not blameworthy. To take the court fittings, about which there was another grumble in Parliament a few days ago. Before designing these Mr. Street visited every approved court in the kingdom, and measured and sketched its fittings, taking evidence from those who used and approved them. Upon this information he based his designs, which were submitted to a committee, including the Lord Chancellor, the Judges, and delegates from the Incorporated Law Society. Whether they understood the elaborate technical drawings laid before them may be questioned. But they were unanimous in condemnation of the design, whereupon two of the courts were fitted up experimentally in deal with seats and desks arranged to suit the views of the learned committee, and the courts so fitted up were approved by them and thereupon copied in wainscot. No sooner were they completed than they were found to be unsuitable, and Mr. Street was most unjustly blamed for the fiasco. An attempt was then made to revert to Mr. Street's original design; and a sort of hybrid scheme is the result,—satisfactory to no one; and those who are really responsible for the failure stand aside and allow the

unfortunate architect's name to be execrated for the sins of other people. We have never been among the admirers of the building as a whole, though appreciating fully its admirable points of architectural detail, in which the spirit of Mediæval work is so well reproduced. But if the above be, as we are assured, the true story in regard to the fittings, it is at least only common justice to Mr. Street, who can no longer defend himself, that the blame should not be laid on him for a matter in which his own intentions were traversed.

THE question of cross-river communication was before the House of Commons on Wednesday last, when, on the second reading of the "Metropolitan Board of Works (Thames Crossings) Bill," Mr. Ritchie moved that the Bill be referred to a select committee, five to be nominated by the House and four by the committee of selection. In the course of a discussion, in which the amendment was supported by Mr. Firth, Mr. Ralkes, Mr. Bryce, Sir C. Dilke, and Sir R. Cross, a very general feeling seems to have been indicated that the Metropolitan Board of Works did not sufficiently represent all the interests connected with the subject to be left without the more full and special investigation for which such a committee would afford opportunity. Mr. Ritchie criticised the proposal for the subway or tunnel on the ground that its site was much too far west to prove a real advantage, and that the heavy gradients of approach would prove a serious drawback to its usefulness; a point on which we have already commented to the same effect. The amendment, which was opposed only by Sir J. McGarel Hogg and Baron H. de Worms, was agreed to. There will thus be some likelihood that the conditions of this important scheme will be fairly and fully considered before anything decisive is resolved upon, or any money possibly thrown away. The scheme was alluded to by Mr. Ritchie as one for providing a tunnel and various ferries conjointly. We again urge that the ferries be tried first.

If what we hear be true, that there is a movement among some members of the profession, who are dissatisfied with the present condition of the Institute of Architects as their representative body, to secede and form a professional society of their own, we can only say that such members are meditating a very unwise and what may be called, in the broad sense of the word, a very unpatriotic course. The part of those who complain of deficiencies in the representative body at present ought to be, to come forward and do their best towards assisting to render that body what they think it should or might be. Any other course is suicidal as regards the practical and material interests of the architectural profession. The Institute possesses the respectable basis of a Royal Charter (a matter not without its influence on outside opinion), and a really very well constituted, and, on the whole, well-worked machinery for action in matters which concern professional interests. What is really wanted is that it should pay the same attention to the first provision of the Charter, that it should not "for the advancement of the art of architecture," which it pays to the consideration of material and business interests. The very people, members and non-members, who could do most in furthering the former object, stand apart with their hands in their pockets and pose as mere critics. If they would take the less easy but more useful and honourable roles of leaders and helpers, the Institute might soon be in a position to defy the sneers of those who, sometimes not altogether unjustly, regard it as a professional "Trade-Union."

ACCORDING to a published report by Mr. Carpenter on the state of Sherborne Abbey tower, this erection is in a state of disintegration which will call for very extensive repairs, without loss of time. The whole of the east face it is proposed to rebuild from the back of the relieving-arch over the choir-arch; and, judging from the appearance of the tower when we last saw it, no less thorough "restoration" could be effective. The *Times*, we observe,

innocently compliments the architect on his "ingenious conception" of an iron girder with springers, by which all thrust from the arch will be obviated, which is apparently regarded as a new invention not before heard of. Messrs. Warner have recommended that when the bells are re-hung, after the restoration, the great tenor bell given by Wolsey should be omitted from the peal. This would be a great pity, and would take from the peal its almost unique character among the swinging peals of England. We should have hoped that architect and bell-founders between them could have provided for Wolsey's bell to swing in safety.

FROM a communication sent to us from the Office of Works, too late for publication last week, we learned what has already been published in some of the daily papers, that the Chancellor of the Exchequer, the First Commissioner of Works, the Right Hon. W. H. Smith, M.P., Mr. Philip C. Hardwick, and Mr. Ewan Christian, have been appointed by the Government to act as judges in the competition for the new Admiralty and War Office. The designs for this competition were to be delivered before noon last Saturday. We have pleasure in expressing our approval of, and confidence in, the committee thus selected, in which the profession of architecture is represented by two members thereof whose competency to form a fair judgment on the designs submitted will not, we think, be questioned.

WE are glad to see that an effort is being made to secure the disused burial-ground of St. John's, Westminster, as a recreation-ground for the inhabitants of a very crowded neighbourhood. A faculty has been granted by the Consistory Court for this purpose, and the Duke of Westminster has contributed 1,000*l.* towards the formation of the garden. In an article on "A Sketch of the Future of Westminster" some years ago (*Builder*, Sept. 21, 1878), we called attention to the capabilities of this wasted piece of ground, and suggested its formation into a garden. Perhaps we may hope to see some of the other suggestions contained in our plan of that date carried out, sooner or later.

It is understood that a proposition has been made that the drawings sent in by students for the R.I.B.A. prizes should in future be regarded as the property of the Institute, and the right of publication be denied to their authors. We should hardly expect that such a course would be favourable to the promotion of active competition among the students of the future, to whom the publicity of their designs, when successful, is obviously a matter of considerable interest. The same policy of suppression was tried some time since in regard to the papers read at the Institute. One result was that one or two of the foremost men in their ranks declared their intention of not contributing again to the Transactions until this bar to real publicity was removed.

ELSEWHERE we print the substance of a circular from the Science and Art Department in reference to a proposed exhibition of the work of students of the schools of art in the kingdom since 1862. Thus we shall have, parallel with the Health Exhibition, which will show us how our bodies are being cared for, another exhibition which will afford a comprehensive means of judging of the results of the art-teaching of the last twenty-one years as directed by the Government schools. This will be a matter of considerable interest, and one which is likely to give occasion to a good deal of variety of criticism. If, as we gather, rewards or prizes are to be given in connexion with this general exhibition, we hope the Department will be a little more reserved in this matter than they usually are in their annual distributions, and not destroy the value and meaning of rewards for merit by scattering them broadcast.

FROM a report in a Birmingham paper it appears that Mr. William Morris prefaced the

first of two lectures at the Midland Institute, on "The Gothic Revival," by describing that revival as an attempt to break down the slavery first imposed upon us by the Italian Renaissance, and said that any attack, however feeble and from whatever side directed, to break down "such a monstrous and cowardly tyranny," was worthy of attention and sympathy. If Mr. Morris is so one-sided and so bigoted as to see no more than this in Renaissance art, we should hope, at least from what we remember of the temper and perception of the Birmingham and Midland audiences, that his hearers had common sense enough to repudiate his convictions. If Mr. Morris would confine himself to artistic design, in which he has shown such exquisite talent, and avoid social and artistic criticisms, he would do better for his own repute than by posing as a prophet and crying out in deprecation of every form of art or society except that which happens to fall in with his own perceptions.

WE have received a rather eccentric circular bearing the signature of Mr. A. H. Mackmurdo, announcing the forthcoming appearance of a new periodical, to be called *The Century Guild Hobby-horse*, and to deal with art and letters. The new journal is not to be "a creature of commerce, made for a market, cried at the corners":

"Instead of padding and pilfering under the disguise of domino, to bring up letter-press to requisite weight by the first of each month, our relation to readers and writers allows us to depend upon an extension of time for the make-weight of matter, and upon gift of contribution for sincerity of conviction."

Done into English, this means, we presume, that the journal cannot be depended upon to appear at any particular date, and will not pay its contributors. We should really suggest to Mr. Mackmurdo that one of the qualifications for literary work is the faculty of writing idiomatic and intelligible English, and that the definite article is an integral portion of the language. However, as Sir Hugh Evan says, "his meaning is good." One of the subjects promised is a synthetic history of pictorial art, illustrated by the contents of the National Gallery.

IN reference to a proposal to place a monument to Lord Frederick Cavendish in the neighbourhood of Bolton Abbey, some gentlemen, who ought to know better, have addressed an exceedingly foolish letter to the committee to complain that the whole scenery, *genius loci*, and what not, of the landscape would be spoiled by such an addition. The design for the monument, by Mr. Worthington, we have not seen, but if it is good in itself, it will certainly not spoil the landscape. The objectors had better study the combinations of architecture and landscape to be found in the works of Claude and Gaspar Poussin, and learn a little more about the subject than they seem to know at present.

CALCULATING SCALES.

WE have received a small pamphlet on calculating scales for ascertaining at a glance the proper thickness of retaining walls, which has an interest, apart from its technical use, as being the work of an Indian Associate of the Institution of Civil Engineers, Lala Ganga Ram, formerly an engineer of the Public Works Department in India, who puts on the title-page of his little work the certificate from Major Alan Cunningham, of the Royal Engineers, and late Professor of Applied Mechanics, Rangoon College:—"Your scales are very ingenious and very handy for those who have such work to do."

It is a remarkable fact that the great advances which have been made within the few past years in the use of graphic methods of design has not been accompanied by a corresponding activity in what bears almost the same relation to the drawing-board that dynamical bears to statical science, viz., the construction and use of sliding scales. We have hunted in vain through not a few mechanical books for a good account of either the English or the French slide-rule, valuable as these instruments are to those who

are familiar with their use. Knight's "Practical Dictionary of Mechanics," which is a very reliable book as far as it goes, though deficient in scientific information, simply says:—"Some rules have a slide in one leg," which is not very instructive. Perry's "Practical Mechanics," published last year, is one of the latest works which has come through our hands, in which some clear account of these useful instruments ought to be found. But Mr. Perry merely remarks, in the page to which the word "slide rule" in the index refers, "how few workmen know how to divide or multiply numbers, to square or extract roots, by means of the slide rule! How few educated engineers, even, are able to make use of it! The owner of the instrument-shop in which it is sold is seldom able to explain its use. It is known that very complicated problems can be worked out on it, but it is also known that to learn the working of these would require more time than it is worth while to devote to them, and, besides, they would be readily forgotten, whereas it is not sufficiently well known that the really useful processes of the slide-rule can be taught to any man in a few minutes." Here, unfortunately, the subject is dropped. The remarks as to a complicated process would apply with about equal force to the study of algebra,—if not to that of Euclid himself,—who, by the bye, is signally slighted by many modern professors. But we look in vain even for the few words that should explain the "really useful processes." In Shelton's "Mechanics' Guide," a book written by a working man for working men, we find a chapter headed "instrumental arithmetic, or utility of the slide rule," which gives rules and examples for multiplication, division, rule of three, involution and evolution by the English slide-rule, but which makes no attempt to explain the theory of the instrument. The French slide-rule, of which we have one signed Gravet Lenoir, 14, Rue Cassette, Paris, is a very elegant instrument, in which the divisions are set out on the principle of a logarithmic curve, and on the back of which is a series of very useful equivalents. There is, we believe, an explanatory treatise, but we have it not at hand. A sort of hybrid between the scale proper, or such an old friend as the 2-foot rule, and a slide-rule, is the ingenious scale of Gunter, generally used for plotting the chains and links of the land surveyor. In this, as is well known, great accuracy of measurement is attainable with few vertical lines, by the introduction of sloping lines, and of the method of taking the distance by dividers from the part of the scale that gives the nearest indication of the length sought.

We may note, as essentially of the same class of appliances as the scale of which we now speak, the diagrams given by Mr. Jackson, in his translation of Kutter's work on the discharge of rivers and canals, for obtaining the value of any one of the four quantities used in such calculations when the other three are given. In this the elements are so arranged on paper that by laying a straight-edge from point to point the required answer will be found. This, it will be seen, is an approach to a calculating-scale.

The object of the calculating-scale mentioned at the head of the present notice is to arrive readily at the proper thickness of retaining walls by simple inspection. The author premises that a retaining wall has to be designed to meet the requirements of stability, safety, and adequate foundation. That is to say, it must be of sufficient weight not to heel over, or, in other words, the resultant pressure must not fall outside the base; the greatest force of pressure must not approach the crushing strength of the materials used, with a proper allowance for margin, and the pressure on the foundation must not exceed the resisting capacity of the area of the same. As to the last, a wide experience and a careful observation of each case when the wall has to be erected is required, and we have very strong doubts how far the work of the engineer in this respect can be facilitated by any mechanical calculator. As to the other points, the opinion of Major Cunningham as to the utility of the scales will have great weight with those who are aware of the claims of that officer to be regarded as an authority on the subject. Major Cunningham's hydraulic experiments are among the most careful and detailed of any to be found in the English language. For the mode in which the scale is to be used, we refer to the little pamphlet, which is published by E. Tann, 75, Chancery-

lane. The author has not given any account of the principle on which the scale has been constructed, although he gives a drawing of one of these implements, as well as rules for its use. He also gives comparative examples of results obtained by the scale, and of those arrived at by accepted formulae, which are closely accordant. The work is worthy of the serious attention of engineers and architects.

A second scale is prepared, by the same engineer, for calculating the scantlings of beams and joists, and the strains on trusses. We are also promised scales for strains on girders,—whether plate, flanged, latticed, or of any other shape,—by which the bending and shearing strains at any point are to be found at a glance. We can only repeat that the advance in graphical methods of design is such as not only to facilitate, but even to demand, a great development in the construction of various forms of slide-rule, and that Lala Ganga Ram has the credit of having been among the first to give a practical answer to this new demand on the ingenuity of the engineer.

MR. POYNTER, R.A., ON EGYPTIAN SCULPTURE.*

I HAVE been invited to lecture to you on Sculpture,—an art of which I have no practical knowledge; it is therefore with the greatest diffidence that I address you, for two reasons; first, because, having no practical knowledge of the art, I can be of no use to those students who come here to study in the modelling school; I can give you no hints as to methods of procedure from my own experience; and secondly, because, not being able to lecture to you from this point of view, I am obliged to fall back on the literary and historical side of the subject, in which again there are many who are far more competent to give you trustworthy information than myself.

You have just had the inestimable advantage of two lectures from Mr. Newton, lectures at which you may be sure I was present, and to which I listened with the greatest attention. Had I known, when the honour of giving these lectures was proposed to me, that Mr. Newton had already been persuaded to enlighten you from the vast stores of his learning and experience, I should have thought twice about undertaking a similar task, for in a subject like that of the history of antique art, on which I intend to address you, it is only with the crumbs of information picked up from the results of the labours of those who, like Mr. Newton, give their lives to the study, that I can venture to come before you. Where the field of research is so large, and details are so infinite, the most ordinary accuracy is a matter of difficulty. I have chosen antique sculpture for my subject, because, in the first place, the art of the Greeks is not only in itself the greatest and the most complete which the world has produced, but is also the base on which all the higher forms of art are founded; and also because the absorbing interest of what was done by the ancient nations of the world seems, when once the mind has fully entered into it, to preclude attention for the time at least, to all other. To the mind which has taken in the surpassing perfection of Greek sculpture, there seems to be room for nothing that comes after it. Even the works of that great Florentine of the Renaissance, with all their originality, splendour of design and elevation of thought and style, seem then to sink into a second place; the element of freshness and exuberance of life which underlies even the lighter forms of Greek art,—the element of unconsciousness especially,—is wanting, and we feel that we are in the presence of something sophisticated, which is the necessary result of art having entered a second stage of the world's history.

My attempt in the direction of an historical outline may, however, be the right one, for a lecture on sculpture in this place should not be for the advantage of the students of modelling only, but should be for the use of all, the study of typical works of sculpture being not without advantage to the student of architecture, while to the painter it is indispensable, not only for the purpose for which you, gentlemen, follow the course of study, too familiar to you, you may think, under the name of "Drawing from the Antique"; but for the purpose of improving and simplifying style, especially in the higher

forms of decorative design, the study of sculpture is of the very highest importance. It is, perhaps, the secret of Michelangelo's overwhelming superiority in monumental painting that he was by profession a sculptor. The very ground on which he excused himself (that painting was not his art) from undertaking the decoration of the Sistine Chapel was the basis of his exceptional success. It was the knowledge of the conditions which are an absolute necessity in sculpture which enabled him to concentrate his power on those painted figures which are so vivid in their reality that they seem almost endowed with life and motion. But, independently of this object, any help towards the understanding and appreciation of great styles of art cannot but have an inspiring effect on the student, which, in whatever direction in the walks of art his individual bent may lead him, must necessarily be so much to the good in the future practice of all; while it should have the effect of leading some to an attempt at emulating the highest efforts of human genius. A proper appreciation of a style and period of art is very much assisted by a knowledge of its history. Mr. Newton told you how necessary it is for the archaeologist to keep his mind constantly exercised in comparing one work with another, and one style with another, that he may have a clear idea of the place it should occupy in the development of the various schools and styles. A knowledge of this kind cannot be without advantage to the artist also. The habit of comparison is a necessary process to aid us in formulating our critical perceptions, that is, in increasing our faculty of judgment and our sensibility to beauty, which are, as Burke says, "the qualities which compose what is called a taste." In giving you, therefore, such an outline of the history of antique sculpture as I am competent to do, I shall hope to interest you sufficiently to tempt you to pursue the subject on your own account. Nor is the material wanting. In the early days of this Academy as an institution there were scarcely any works on the subject to which the student could turn; such as there were, indeed, were founded on hypotheses long ago held to be untenable. Now every year sees some popular work published, accessible for reference to every student, and containing every year more complete information as investigation and discovery open up fresh fields of knowledge. With such histories it is not only impossible, but unnecessary for me to compete. I shall attempt, therefore, as I have said, to give you only an outline, and that in a somewhat discursive manner, giving you from time to time the result of my own impressions as an artist, which in archaeological matters you must take for what it is worth, and illustrating them by referring you whenever possible to the British Museum, and to works with which you are acquainted. And here I may mention the invaluable assistance which will shortly be afforded to all of you in the Museum of Casts which will before long be opened at South Kensington. This museum is due, in the first place, to the energy and persistence with which Mr. Walter Perry worried the authorities until he obtained a grant of money with which it could be started,—on a small scale, it is true, compared with what is done abroad in most towns of importance, but still on a scale sufficient to put the student in possession of the leading facts in the history of art. That the thing was ultimately done is due to the enlightened interest taken in the matter by Lord Spencer when he was President of Council, and consequently at the head of the Science and Art Department. To the casts in this museum I shall also, no doubt, have ultimately to direct your attention, especially in dealing with the earlier development of Greek art. To this point I propose to lead up by a short account of Egyptian and Assyrian art, and the ways in which they may have affected the origins of Greek sculpture. The times are, doubtless, very much changed since those early days when Flaxman delivered his lectures on sculpture. You have heard from Mr. Newton of the vast and valuable discoveries which have been made since that time. But another world has been brought to light which did not come within the scope of Mr. Newton's survey, a world of which neither Flaxman nor any one else of his time suspected the existence. Nineveh, although its destruction by the Medes and Babylonians was not so complete and final as the Prophet Nahum and the Jews had hoped, and as the Greeks believed it to

be when Sardanapalus, the last of their independent kings, burned himself and his palace together,—for it subsisted for some time after this event,—had yet so completely perished in historical times, that its precise situation seems to have been unknown, if not to Herodotus, at least to the later Classical authors; and so it remained for 2,300 years, until Botta, the French consul at Mosul, after burrowing in vain under the village of Koyundjik, and finding nothing but fragments of reliefs and undecipherable inscriptions, made one further discouraged attempt in the mound at Khorsabad, and plunged at once into the heart of the most perfectly preserved part of Sargon's palace; the most brilliant discovery, perhaps, of modern times, which was so brilliantly followed up to the great benefit of our museums by Mr., now Sir Henry, Layard. Flaxman little suspected that under those heaps of mud, rather than in Egypt, was to be found the origin of Greek art, or, rather, of the form with which Greek art first invested itself. With Egyptian art he was, to a limited extent, acquainted, and he devoted one of his lectures to the subject; but he was, like every one else at that time, in complete confusion regarding the history and dates of the works he refers to, for the Egyptian writing was then a sealed book to all the world; and it is only since the deciphering of the hieroglyphs has enabled us to read the inscriptions and the names of the Egyptian kings that it has been possible to form a connected history of the country and so of its art, for the name of the reigning king was constantly affixed to works of art, and when this is so, their relative chronological position, if not the actual date, can, in the present state of Egyptology, be ascertained with approximate, and sometimes with absolute, accuracy. You will find that Flaxman ascribes most of their great works to "Sesostris and afterwards," fixing the date of this king at about 1,000 years before the Christian era; and he adds the curious remark that the arts of Egypt and Greece were then in a state of progressive improvement at the same time. Now Sesostris, as I have no doubt you are aware, is a legendary personage of Greek invention, or, rather, of late Egyptian invention; for when Herodotus obtained his information from the priests at Memphis, the great Theban dynasties had been extinct for nearly 700 years, and the exploits of Sesostris are made up of those of many celebrated Pharaohs rolled into one. The king with whom Sesostris is most identified was Ramses II., or the Great, who lived about 1,350 years before the Christian era, and it was in the early part of his reign, no doubt, that, not only as regards the magnificence and the profusion of the works produced, but also as regards elegance of proportion, and, in some respects, beauty of style, Egyptian sculpture reached its culminating point, from which during his reign, though production did not cease, it fell rapidly in merit. But the earliest existing work of Greek sculpture, the Lion Gate of Mycenae, is not placed earlier than the beginning of the eighth century B.C.,—500 years later than the death of Ramses; which shows us how wide of the mark Flaxman was in making the arts of Egypt and Greece march hand-in-hand. Flaxman, however, was not the man to under-estimate the great qualities of the art of the Egyptians, and in his measured language he says that "in Egyptian sculpture we shall find some excellent first principles of art"; and it was probably this perception which led him to consider it at least in sympathy with the Greek; for he does not make it clear whether he supposed Greek art to have influenced that of Egypt, or the reverse; and another remark of his, to the effect that the rudest works are the earliest, shows the state of criticism at that time, and how readily people jumped to what appeared to be a natural conclusion,—a fault from which we are not all of us free, even in the present advanced state of critical methods of examination. For we now know, it may be said with certainty,—unless, indeed, the most distinguished Egyptologists are on a false track,—that, although there was a development of ideal treatment towards elegance and symmetry, to the culmination of the art in the nineteenth dynasty, the sculptors of the Old Empire,—that is, of the early third, fourth, fifth, and sixth dynasties, which reigned at Memphis,—greatly excelled that of the Theban in its truth to nature and its rendering of character, the process being precisely the

* A lecture delivered at the Royal Academy on Monday evening last.

reverse of that which usually takes place in the course of the artistic development of a nation. The earliest specimen of Egyptian sculpture that we know of is a kind of which numerous specimens have been found in Lower Egypt, and a woodcut of it is given in Messrs. Perrot & Chipiez's work on Egypt, lately published, referred to by the President in his address to the students on the 10th of December, and which is a mine of information and illustration. And here I must beg you to excuse me if in the course of this lecture I again go over some of the ground covered by the address of the President. His discourse was on art generally, it is true, but so much of the art of the ancients exists in the form of sculpture only, that the history of their art and of their sculpture is practically almost the same.

To return. The specimen to which I am now referring is a group of a man and his wife, evidently portraits of the occupants of the tomb where they were discovered. They are certainly not what can be called rude in execution, though they are somewhat doll-like in character; but the archaism is absolutely different in kind from the archaism of Greek art, which is purely typical, and which certainly did not begin with portraiture. This group is supposed to be of the third dynasty, and the imperfect character which we see in it does not seem necessarily to be the result of its extreme antiquity, but may be due to its being the work of an inferior artist; for another group, which is thought to be undoubtedly of the reign of King Senoforn, the last king of that dynasty, also engraved in the book I have referred to, is hardly inferior to the best work of the kind which has been discovered. Of the previous stages which the art had gone through before this time when it appears thus springing full-grown into existence, we know nothing.

The type of the earlier sculpture is generally of this class,—single portrait statues and groups,—found in tombs. They are called "doubles," and are described by M. Maspero as supports to the soul of the deceased. Food was placed before them, and in some cases they are found accompanied by figures of their family and household. Thus servants are represented grinding flour or kneading the bread on which the "double" of the deceased was to live; and the scribe is also there, pen and papyrus in hand, to register accounts for his wooden or stone master, precisely as in life. The tombs have thus furnished us with a certain number of figures in action, an extreme rarity in Egyptian sculpture, and never, I believe, found elsewhere than in these Old Empire tombs. Smaller figures and statuettes have been found in the Theban tombs of the later dynasties, and these seem to have served the same purpose and to have represented the living soul of the deceased; in any case they were frequently the recipients of severe remonstrances addressed to them by their survivors if affairs went wrong after their death, in the form of protests written on slips of papyrus and attached to the body or the pedestal. Many of these have been found.

The earliest statues are, as I have said, of the third dynasty: the dynasty, that is, which preceded the dynasty of kings to whom we owe the Great Pyramids; and they are found in the tombs which abound in the neighbourhood of these and the numerous other pyramids in Lower Egypt at the head of the Nile Delta. The period of the third dynasty has been fixed approximately by Brugsch at from 3966 to 3766 before the Christian era. I do not know how far this view is generally accepted; but the opinion of certain English Egyptologists that the Memphian dynasties have no claim to greater antiquity than the Theban, and that, in fact, they were contemporaneous, is, I believe, now entirely discredited; it arose probably from the desire to make Egyptian history fit in with the dates assigned by theologians to the events of the Old Testament. Looking at the evidence supplied by the art alone, it would seem impossible that two important and flourishing kingdoms, of the same race of people and with one language, could exist for hundreds of years in immediate proximity to each other, not only with no natural frontier between them, but with the great highway of the Nile connecting them; and that thus, existing side by side, they should practise methods of art and architecture founded on totally different principles.

To return to the portrait-statues. We find that they are remarkable for the expression of life and character. The attitudes are restricted, but not so monotonous as in the later Theban art when it had become more idealised. The

heads especially are amazingly life-like; with regard to their truth to nature and to character. Messrs. Perrot and Chipiez make the same observation which I myself made in a short account of Egyptian art which I wrote three or four years ago,—that they recall those remarkable Florentine busts of the fifteenth century, of which you may see such admirable specimens in the South Kensington Museum. The limbs of these early figures also are much more studied from nature, and much truer to individual character than those of the later school; besides that the desire to make a portrait would lead the sculptor to render natural forms as closely as he could, a reason for this superiority may be found in the materials which were generally employed; wood and soft limestone would leave the sculptor more free to give expression to individual form, than the terribly intractable materials which were commonly used later on. The colossal size of the Theban statues would also, for reasons which I shall refer to presently, stand in the way of a faithful, or rather of an individual and realistic treatment. The tomb statues are always painted, and the most carefully finished have the eyes inserted in crystal and dark stone, the white being made of ivory or enamel, and the eyelashes attached in bronze, giving an appearance so life-like, even after an interval of from 5,000 to 6,000 years, that on a tomb containing two statues thus realistically embellished being opened by M. Mariette, the Arabs fled in terror, throwing down their tools, under the impression that they were living genii, and on recovering from their fright, were only prevented by a revolver from breaking them to pieces. This method of treating the eyes was not unknown to the Greeks; you may remember that the eyes of the chryselephantine statue of Pallas Athene by Pheidias, were similarly treated; and in the British Museum, at the entrance to the Egyptian Gallery, is a bronze statue of Apollo, which has the eyes in some white metal, the pupils being hollow, perhaps originally filled in with enamel. The effect of course is staring, now that the bronze is black with age. Formerly it may have been of a light golden brown, and was no doubt as brilliant in surface as the white metal in the eyes. To bear out my remarks on the natural treatment of the tomb-statues, I refer to two illustrations from Messrs. Perrot and Chipiez's book, one of the architect Nefer, who built one of the pyramids, and the other of a famous statue in wood, christened by the felahs, the Mayor of the Village; both are in the Museum at Boulak. You will see in this figure of the architect a remarkable truthfulness in the rendering of the frame. There is a very thorough expression of the collar-bones, and in the torso, although it is small in the waist,—a characteristic of Egyptian figures from the earliest to the latest times,—the play of form due to the structural anatomy under the skin is fairly well expressed, and the arms are remarkable for truth of treatment. A very much injured headless statue of the fourth dynasty in the British Museum will show you the same qualities, although the execution is rougher than this seems to be. The varieties of position are limited,—standing, or, rather, walking, for one foot is invariably before the other, sitting, or squatting, with the knees up to the level of the chin. These are the usual positions; but we find also in the tombs of the Old Empire a few figures with more action, as servants grinding corn, kneading dough, scribes sitting cross-legged and writing, to which I have already alluded,—actions which are expressed with great fidelity to nature. Later, the attitudes in the statues, whether of gods, or kings, or mortals of humbler rank, appear to be strictly limited to the few positions I have described, and which, being very familiar to you, need no further description on my part. I must instance here a very beautiful and touching group, in painted limestone, in the British Museum. It is a work of the same class as those which I have been describing, and represents a husband and wife, sitting side by side. His hand is held in an affectionate manner in both of hers. This group is ascribed on the pedestal to the nineteenth dynasty. There is no inscription by which it can be dated, and it is not stated where it was found; I presume, therefore, that it is the style of treatment which has suggested the date given to it. According to Mr. Sharpe, who is, however, frequently a prejudiced, and therefore not a very safe guide, the heads are of the Lower

Egypt type. If it be of the date given to it, it shows that the practice of making life-sized portrait groups for the tombs did not cease with the Old Empire. In any case it is a work of the highest beauty; perhaps the most beautiful Egyptian sculpture in the museum. The execution is both highly finished and faithful to nature; the attitudes, though formal, are easy; the finish given to the hair could not be surpassed, and the careful way in which each lock is tied at the end seems to point to its being a wig; but the feet, above all, are of beautiful workmanship, and are well worth studying,—in this differing from the generality of their works. The feet in the Old Empire statues are usually short and thick, and very much neglected in finish; later they are longer and straighter, as in the group I am describing, and it may be for this and other reasons derived from the workmanship that the date of the nineteenth dynasty is assigned to it. I would draw your attention to the perfect form of the nails, and to the distinction which is most delicately indicated between the male and the female foot, the former being equally elegant in shape, but having the tendons slightly more marked. The feet, of course, are not of the Greek type; they have the long, thin character of the Oriental foot, with slender, straight toes. We have in this group a combination of the qualities which we find in both periods of Egyptian art; a strong feeling for nature, and a generalisation of forms, which appears in this case to arise from the instinctive feeling of the artist, and not to be in accordance with prescription. The drapery is treated also with great delicacy, and in the usual manner, in parallel and radiating lines of great regularity, but perfectly expressing the arrangement of the material. And here I must protest against the assumption of Egyptologists on two points,—the treatment of the hair and of the drapery. I do not think that it follows, from the wig-like appearance given to the hair in the statues and reliefs, that the Egyptians all wore wigs; that they did wear them we know, for they have been found in the tombs, and there is one in perfect condition in the British Museum, and others, I believe, at Turin. But we find the hair of all classes represented in the same wig-like manner everywhere, and I have no doubt that this is merely the conventional manner of treating the hair in sculpture, and that we are not bound to assume that a wig is always intended. Again, it is always assumed that the regularity of the folds in the drapery implies the use of the gauffering machine. I will not say that the Egyptians did not gauffer their linen; what is called a gauffering-machine has been found in a tomb, and is engraved in Wilkinson's "Ancient Egyptians." But the treatment of drapery is always the difficulty latest got over in the progress of art, and we find this regular treatment of folds in all early art; I believe these small regular lines, therefore, to be the means employed by the Egyptians to express the thin drapery which they wore, and which has a tendency to go into a number of fine parallel folds; just as the regularity of the zig-zag edging in Archaic Greek art is only a typical treatment of the natural tendency which the edge of drapery has to take this zig-zag form.*

THE FRENCH DECORATIVE ARTS AND A NEW STONE SUPPLY.

THE permanent Museum of Arts applied to Industry, held at the Palais de l'Industrie, in the Champs Elysées, Paris, after closing its doors for a few weeks, is now reopened. To the former exhibits two new sections have been added. The first is a room for mouldings, where ancient and modern specimens of ornamental art are collected, in such a manner as to facilitate teaching and study. At present the collection is not very rich; some fragments of architecture, some plaster casts, borrowed from various countries, are all that can be seen. The president of the Association, M. Antonin Proust, has, however, organised a workshop, where the moulding of models is carried forward with considerable activity. There will soon be a complete series of specimens ready,

* The remainder in our next. We have not space to give this and the succeeding lecture immediately, in full as delivered; but we regard the lectures as of so much value and interest that we propose to give them entire, by dividing them over four consecutive numbers.

divided into epochs, to which will be added galvanoplastic reproductions of bronzes and art works in other precious metals.

The second room contains a large assortment of marbles, agates, and various hard stones, recently discovered in the Department of the Vosges. The blocks are of unusual size, and it is considered that the find will prove of great advantage to architects, lapidaries, and others. In brilliancy and in delicacy of tone the stones are also much admired, and their size will facilitate the production of new and startling effects. The Department of the Vosges has always been renowned for its geological treasures. Up to the close of the sixteenth century its agates were celebrated, but no agate has ever been obtained from this district equal to that which is now on view in Paris. It is a mixture of amorphous and crystallised silica, disposed in irregular layers, on which are implanted prismatic crystals of amethysts of a most beautiful violet. The spaces that are not occupied by the violet quartz are filled with red jasper,—that is, silicious clay, coloured by oxide of iron.

The engineer of the quarries in the Vosges, whence this splendid agate has been derived, speaks in high terms of the recent discoveries, which are sufficiently important to reduce considerably the price of the ornamental stone used for building purposes. The stone of the Vosges is similar to that which the Egyptians of Syene employed when making obelisks, and is consequently called syenite. It is extracted from mountains whose dome-shaped summits explain the term *ballons*, by which the rock is generally designated in the country. The syenite is of a granitoid texture, its crystalline elements are solidly united by simple juxtaposition and not by any cementing substance. The fundamental elements, a feldspar or silica with potash and alumina, and an amphibole or a ferro-magnesian silica, are thus intimately associated. To these two constituent elements the quartz of hyaline is added. This quartziferous syenite is found in very large quantities at TERNAY, where it is generally extracted to make columns, urns, tables, &c., and is known as the *syénite feuille morte* on account of its dead-leaf coloration. The whole of the Servance mountain is made of this stone, and blocks can be cut out measuring some 7 by 12 yards. When polished the effect is very striking. The red syenite is obtained in great quantities at Haut-du-Thenn, and is composed of amphibole and orthose without the quartz. When polished these stones give a brilliant reflection, and are able to resist atmospheric influences. This accounts for their high value; but now that a larger supply has been found it will be possible to employ the stone in many instances where formerly it was reserved only for rich amateurs.

MR. G. AITCHISON, A.R.A., ON COLOURED GLASS.*

So long as this so-called white glass was mainly as low in tone as the coloured, only one object was attained, but it was attained without a sacrifice of harmony; directly the white glass admitted the light freely the whole window was out of tone and the spectator was blinded with the patches of light. The third cause was the insane attempt of the glaziers to vie with the painters when they could already produce more divine things. They lost the reality to seize the shadow; accuracy of form, roundness, shadow, perspective, and aerial tints, so proper and excellent in a picture where the light is reflected, were absurd in a transparent material where the light came through the figures and where the sun blurred or destroyed every outline; but for all that the glaziers came down from their glory in the heavens to strive on earth with the painters, and to be ignominiously beaten, and until the end of the fifteenth century we gradually pass from poetry to prose. A round or a cusped line in the old glass was a sort of note that a niche was meant, but afterwards the architecture was nicely drawn, at first gilt and coloured, but gradually it became white, with the carving only in pale gold, and filled more than half the window; the figures, too, became better drawn, but their white mantles filled the larger part of the space left, the under-dress, the background of the niches, and the little left of sky beyond the architecture were alone deeply coloured; even the flesh became at last white; and this pre-

ponderance of white threw the whole scheme of colour out of tone. There were, of course, clever fellows amongst the glaziers, and the velvety quality of the white, like the texture of a cumulus cloud, is fascinating, but the capacity of raising emotion was gone.

In the twelfth and thirteenth centuries the sun adds additional glory to the windows; in the fifteenth and sixteenth it rather spoils them, though you must understand that this does not apply to the fifteenth-century windows of Florence Cathedral.

By some stroke of luck, Florence was to raise again the art to something like its pristine glory, and yet the Tuscans were no colourists. Ghiberti gave some designs for windows in the cathedral; an Italian gentleman had been studying the glazier's art at Lunenburg, and is believed to have been putting windows into Holyrood Palace, when he was sent for to execute these windows. He established himself in Florence, and executed these and other windows in the cathedral designed by other artists, those in the chapels being the most lovely. Here, again, white was banished; but gold and emerald were the predominating colours, instead of crimson and azure. When the sunlight streams through these windows, you ask yourself if they are the rivers of health that cure all human ills, and fancy that the angels come to bathe their wings in this emerald and golden glory. Nothing is so beautiful as the windows at Florence but those at Chartres.

I must not omit a notice of the fourteenth-century windows. The most glorious of these that I have seen are those of the Chapter-house at York: subjects in patterns filled in between with jewelled grisaille, of so low a tone and so lovely and varied in colour, that it vies in beauty with the coloured glass. Unfortunately one window was destroyed; it was replaced with a modern one copied from the old, but of such a wretched quality of glass, that the light admitted differs but little in intensity from that which would come through ground glass, and makes a painful blot in the building; there are, too, some finely-coloured subjects in the aisle windows of the nave, but set in white with clear glass borders much too wide, and patched with rubbish, so that the windows look like a caliph's coat that has been worn by a beggar; you are so blinded by the sun coming through the slits, holes, and patches that you can scarcely see the beauty of the original stuff. The large west window and the large south window of the first transept of Canterbury Cathedral are glazed with panels of the form of the *vesica piscis*, and some of the form of the *vesica piscis*, and with pure white borders, and apparently white tabernacle work in the tracery of the heads. These have a very good, though perhaps a curious, effect: the white is not the translucent velvety white, but jewelled white, and at a distance the effect of the windows is that of white jewelled windows, with a slight introduction of colour,—an effect by no means to be despised. At Fairford Church the windows are of the end of the fifteenth century, and though of unequal merit, contain many beautiful harmonies, and their drawing elicited the admiration of Van Dyck, one window on the south side is very beautiful, nearly all white, but the shading, which is of a rich brown, gives towards evening the effect of brown mother-of-pearl, all the figures have white mantles, and only small pieces of the coloured dresses are seen,—crimson, claret, deep yellow. There are also many beautiful harmonies in the north clearstory of the nave, but generally much lighter in tone; but windows of the north side are necessarily more transparent, as they get no sun.

There are beautiful and original harmonies in some of the clearstory windows of the choir at Cologne, in the side chapel at Strasburg, and in the transept at St. Maurice, Angers, at Pisen Cathedral, in St. Petronio at Bologna, Sta. Maria Novella at Florence, and elsewhere.

One of the most beautiful windows I have seen of the clear variety is the one of the fifteenth century by Vivarini in St. Giovanni Paolo at Venice: the subject is St. George killing the dragon. St. George is in steel armour, on a chestnut horse, transfixing the green dragon in a green field, behind him the blue distance, purple mountains, and blue sky. Signor Boni was kind enough to get this copied for me by Signor Alessandri, as I could not find that it was published.*

In a choir at the Cathedral of St. Maurice, Angers, there is a window of the giant St. Christopher carrying the infant Jesus on his shoulders, and wading through a stream; the sky is blue, and so is the water, and the saint has a mantle of deeper blue, with a bit of apple green vest showing above it, and a crimson scarf, his face and limbs are bronzed with the sun, his hair and beard are bronzed with the staff of golden brown he studies his steps; the infant has a fair chubby face with Italian features, a little light golden curling hair, and a nimbus, and is dressed in black; the black robe cuts against the blue sky, the blue mantle, the bronzed face, the tawny beard, and also against the crimson scarf, and altogether is one of the most striking and original harmonies I have seen, although it is clear and uniform in tone, and consequently misses all the jewelled glow and sparkle of the finest glass.

Von Linge's enamel windows may be fine when strong sunshine is on them, but in ordinary daylight they are nearly as opaque as a canvas.

If you want to see the effect of churches wholly lighted by stained glass, go to Fairford, to Strasburg Cathedral, to St. Etienne du Mont at Paris, and thence to Florence and Chartres, and to some of the mosques and houses in Egypt.

As to the application of glass, it is needless to say we do not want a brilliant light in cathedrals, in churches, in the halls of courts of justice, so pathetically called by the French the halls of wasted footsteps; in the halls and staircases of great public buildings, palaces, and private mansions; and the size of the windows in such places may be enlarged to make up for loss of light. In these, stained glass of the most splendid quality may be put, glass of the quality of the finest of the twelfth century or of that of Florence; but, of course, as far as the figure drawing and composition go, we want to have the best that can be got, and I may here remark that when this jewelled brilliancy and depth of colour is got, all decorative wall-painting must be simple and nonobtrusive, and not try to vie with the gorgeous colours of the glass, but leave spaces comparatively plain for the eye to rest on. I never saw the windows of the Ste. Chapelle in Paris lighted by the early morning sun, but in ordinary daylight the effect of the rich painting and gilding lighted up by the still richer windows is oppressive, and we long for plain stonework or white windows.

If this quality of coloured glass is not suitable for living-rooms; in these we want but little deep or positive colour. If the outlook is pleasant or necessary, the colouring must be confined to window borders, and the colours must be sober, such that will not dazzle, fatigue, or annoy us. Slight colour may be successfully used where a blank wall or an unpleasant prospect is to be shut out. In picture galleries and other places where pure white light alone is wanted, we must banish colour if we cannot so blend it as to make pure white light; still, there is ample opportunity for much to be used, if it be but to give a little interest and warmth where half the year the prospect is most dreary, chilling, and forlorn. Nothing is prettier than to turn a skylight into a pergola, with vines and grapes, or to cover it with leaves of the Virginia creeper, or even with some pleasant pattern. A little colour with much human skill is mostly a pleasant object.

It is mainly owing to the Gothic revival that stained glass has been awakened from its long sleep, and has spread itself to such an amazing extent. Not only are our churches and cathedrals being filled with it, but it is a rare occurrence to find a new building or house of any pretension without some specimen of stained, painted, or enamelled glass.

Where the avowed object of the promoters of stained glass was imitation, we cannot blame those who executed it for producing imitations. The stereotyped phrase of one at least of the great deceased architects was:—"What would a thirteenth-century architect say of this?" and, if it was not the phrase, it was the thought of many other deceased architects, who, if less able, were more influential. Though we are now beginning to deplore these forgeries, whether in stone or stained glass, we must bear with what has been done, at any rate when it is not too abominably bad, and only hope that in the future the glass and the stone may bear the stamp of the century in which they are fashioned, that the figures should at least be well drawn, and the writing be that of our own

* Continuation of a lecture delivered at the Royal Academy on Monday, the 26th ult. (See p. 315, ante.)

* We shall give a drawing of this window shortly.

day. The present European costume is so ignoble that I fear it is beyond the power of art to fit it for a picture. To the best of my belief I have never seen a modern imitation of a twelfth or thirteenth century window that could be mistaken for a first-rate old one. The best imitations I know are those of the Ste. Chapelle, and, possibly, they might be taken for bad windows of the time, though the whole tone is too uniform. I do not say this out of any love for antiquity. I would, on the contrary, much rather think that the modern windows are the best. "The past is nothing, and at last the future can be but the past," but we must not shut our eyes to facts, and we must so use the works of the past as to enable us to excel them.

The glaziers tell us that the glory of old glass depends on its age, the decay of the glass, and its being partly covered with dust, the particles and oxides of the metals and lichens. But hear this from a glass-maker:—"Decay, undoubtedly, tends to harmonise the colours of glass, but there are specimens of ancient glass which show no signs of decay, and which, nevertheless, possess a softness and depth of colour which have seldom been attained by modern manufactures. . . . The effect of old glass lies deeper than the surface, and depends upon its chemical and physical nature. . . . It resembles in its physical nature horn rather than glass. It is translucent, but neither appreciably refracts nor disperses the rays of light, merely sifting them, and suffering them to pass."

Viollet-le-Duc also has some remarks to the point:—"The inequality of thickness in the glass which renders it so hard to fix in the lead is one of the conditions of the harmony and vivacity of the tones; when the pieces of glass are flat and of equal thickness, the light strikes all the pieces in a window at the same angle, and a uniform refraction ensues; but when these bits of glass are full of knobs, and unequal in thickness, they present to the light surfaces which are not on the same vertical plane, from which result varied refractions, adding peculiarly to the brilliancy of the tones and contributing to the harmony; thus it is that in matters of art the perfection of the product is often in inverse ratio to its effect."†

It is only necessary to see the best modern imitations of twelfth and thirteenth century glass in the same building, with fine old glass of the time, to be convinced that the statement is the result of a hallucination; the inferiority is too marked, the colours are less rich and less deep, and consequently no amount of obliteration will raise them to the level of the old glass.

Still, no one who has examined old glass can deny that it is generally nearly covered with dirt, that its outer surface looks worn-eaten, and some of it is often semi-opaque; chemical changes have added to its beauty, they have changed white into opal, and stress of wind and gravity have bulged the surface into hills and hollows, and so added to its tones, and dirt has contributed to its jewelled effect.

The most successful imitation of early fourteenth-century glass I have seen is the large north window in the transept at Durham by Messrs. Clayton & Bell, which has the throb and sparkle of old glass; but when we come to a later period, to the velvet white, and to the still more beautiful pale brown mother-of-pearl, the imitations are excellent.

The clergyman of a country parish, even if he be a man of taste, cannot always prevent an abominable stained-glass window being put up by some wealthy parishioner; but surely in London, with a Royal Academy of Arts for an umpire, public monuments should not be disgraced by the admission of abominations, about which they are not even consulted, though there may not be a professed glass-painter amongst them.

The south windows of the transept of Westminster Abbey might well have been enlarged from those in the plaster churches with a candle in them that are hawked about, and must make us a laughing-stock to all people of taste. Are they even equalled by the modern stained glass in Cologne Cathedral?

As to the prospects of stained glass, I said before that its extension has become vast, and of the prose sort there are beautiful and original varieties containing new harmonies of restrained colour, or, to say the least, harmonies that are

new to me, and even if they have been extracted from minor harmonies in old glass, we should be none the less thankful; to bring into prominence overlooked beauties is a genius in itself. I may point to some of the windows in the eating-rooms of the South Kensington Museum; graceful designs may be found in the Holborn Restaurant and the First Avenue Hotel. Still I must say that, in comparison with the glorious deep-coloured jewelled glass, these prose varieties are like reading mellifluous poetry to yourself in comparison with hearing divine music sung by a genius. There is, however, one development that is absolutely new and lovely; three east windows in the aisles of Christchurch, Oxford, by Messrs. Morris Marshall, designed by Mr. Burne Jones; the upper tracery of one window is filled with sage-green foliage, almost opaque at a distance, the tracery being only marked out by the white edges of the glass, so that our attention is not called away from the main subjects. In the lights are saints and prophets all in white, each one nearly filling the space between the mullions, the deepest colour being the flesh and hair, and the whole of them are crowned with streaky pink nimbus; the figures are walking on yellow gravel, and the background is of drapery in indigo and dull red and semi-opaque; the other windows have angels, also wholly in white, whose blue wings form the background; below are slightly coloured subjects on a white ground. It is something to say that we have found an original genius in stained glass.

It is scarcely necessary for a rapturous admirer of stained glass, who never looks on the windows of Florence or Chartres without feeling that if the dreams of youth could be realised, instead of being a saint, a hero, a poet, or a lawgiver, he would be a glazier, to defend the word; but there seems to be a notion that this word has something derogatory in it. No artist is shocked because he is called a painter, and it seems foolish when we have the word "quince" to call it an "apple of Cydonia." The master glazier was once as well paid, and consequently as well thought of, as the master builder or architect, and is probably very much better paid now than the architect. You will bear with my being prolix and discursive if by so doing I can save hurting any man's feelings.

I think no painter but Mr. Dicksee has ever given us a stained-glass window, and it is curious if stained glass has appealed more to the poets than the painters, but it may be that these have felt how impossible it is to give this coloured light. It is needless to say that the ordinary sketches, drawings, and chromo-lithographs only give vague hints of the colours, still they are useful and occasionally interesting. Some wags have published books of old stained glass, where nothing is given but the outlines in black and white; as colour is the point in stained glass we might as well have a book on the Greek statues in which the colour is given without the shape.

The poets have naturally been much struck with the beauty of stained glass. It is unnecessary to speak of "storied windows richly dight," or the Laureate's—

"And thunder-music, rolling, shake
The prophets blazon'd on the pances."
In *Memorial*, canto 88, stanza 2.

for you all know them.

But possibly Keats's lines are not so well known:—

"And diamonded with panes of quaint device,
Innumerable of stains and splendid dyes,
As are the tiger-moth's deep-damask'd wings;
And in the midst, 'mong thousand heraldries,
And twilight saints, and dim emblazonings,
A shielded scutcheon blaz'd with blood of queens and kings."
—*The Eve of St. Agnes*, stanza 24.

Painters are nothing if they are not colourists, and I often wonder how it is that more of them do not turn glaziers, when I think of the delight magnificent stained-glass windows can bestow upon mankind; it is not only that they can give us a feast of colour unattainable by other means, but that there is an infinite field for Scripture, historical and portrait subjects, that is unfortunately almost closed to any other form of art, in which the noblest forms, the most subtle composition, and the most original harmonies may be indulged in, if they will not forget that it is light they are dealing with, and not a canvas, and remember Theophilus's remark that he had sought "by what subtlety of art and variety of colour a work may be adorned and may not exclude the light of day, nor the rays of the sun."

Painters do occasionally give cartoons, even coloured ones, but unless the painter is a

glazier too, the colour is not much more than a hint that the colours indicated may be tried to see if they will make a harmony in glass. The cartoon will tell him neither how the colours will be mutually affected when the light streams through them, nor how the whole will look 50-ft. above the eye; much less will it tell him how the window will look in sunshine. If it takes ten years to learn the art of using oil-paint, to use coloured glass will not come by instinct.

Although the designing and making coloured, stained, and painted glass windows is artist's and not architect's work, I trust that the remarks that I have made to-night on this splendid adjunct to your buildings may not be looked upon by the architects as a useless waste of their time.

If our art should be fortunate enough to attract to it a man who, like your President, shines in all the arts, glass-painting may be a subject worthy, not only of his consideration, but of his talents; it may afford, too, an almost unlimited scope to artists for employing their skill from the slightest suggestion in enamel to the glorious richness of transcendental colour, and without debarring them from the use of noble form and masterly composition, if they will only deign to consider that the paramount object, at least in the fuller variety, is lovely colour and not bad pictures.

Coloured glass is, undoubtedly, for the colourist, the means by which the highest effects of colour may be reached, and, for the lover of colour, the means of producing a rapture analogous only in its effects to that produced on musical devotees by the finest music without words.*

NEW DISCOVERIES AT SÈVRES.

MONSIEUR LAUTH, the director of the Sèvres State Porcelain Manufactory, has made important discoveries, which will, we are told, render modern china as rich in tone as the ancient specimens of Eastern ceramic art. The results attained, though officially proclaimed, have not as yet been shown to the public. During the course of this year we shall have the advantage of examining these improvements, for some specimens will be sent to the biennial Exhibition of Fine Arts applied to Industry, to be held at the Palace in the Champs Élysées.

So much has been said concerning the ceramic arts that it is unnecessary to describe the various modes of manufacture or the materials employed to produce plain and enamelled hard ware, plain and decorated porcelain, soft and hard clay. The hard clay is made of pure kaolin, and its adamantine enamel is due to the admixture of feldspar, while the ordinary tender clay is mixed with silice. In theory special colours are used for these different materials. The colouring oxides which resist the baking of soft clay are volatilised on the hard clay, which is exposed to a heat of 1,500° C. The number of colours that can be used for the latter product is therefore very limited. Nevertheless, the Chinese and other Oriental peoples obtained a richness and depth of tone, a unity and harmony of tint and colour, that excelled even the best Sèvres work. With the assistance of M. Vogt, the chief of the laboratory, M. Lauth instituted a series of experiments and researches, so as to discover some mixture which would enable the clay to support the colouring, in spite of the currents of oxygen produced by excessive heat. Success finally rewarded these efforts,—not merely laboratory success, but a manufacturing success. The specimens produced are not flat and simple pieces of hard ware or porcelain, but large works of art. Nor is the result accidental, that is, unreliable; but the process, once known, can be carried out with the certainty of success. This, if anything, is an improvement on the ancients, for their colours did not take in every case, and their successes were always accompanied by a certain number of failures.

The objects, both large and small, that have already been manufactured at Sèvres according to this new method are especially striking by their modern appearance. The colours imitate, or, rather, reproduce the richness of tone of ancient and Eastern ceramic

* I have to return thanks for the kindness I have received at the hands of Sir P. Cunliffe Owen and the South Kensington authorities for the loan of the Arab window, to Messrs. Burke & Co. for their slabs of onyx and alabaster; and to Messrs. Clayton & Bell for the magnificent series of drawings showing the examples of stained glass of different periods.—G. A.

* Technological Handbook, "The Principles of Glass-making, 1883," pages 95, 96.

† Viollet-le-Duc, "Dict. Raisonné," art. "Vitrail."

art, but the designs and ideas are altogether modern and western. The orange and citron yellow are as vivid as in nature, and the turquoise blue is perfect. This new porcelain, according to M. Ch. Burty, who has been admitted to a private view, is transparent, and will maintain the high reputation of Sèvres for both cream and milk whites. These advantages, however, we shall be able to judge of for ourselves at the forthcoming exhibition; and we are further promised the publication in the French *Official Journal*, and other papers, of a *mémoire*, describing in full the methods employed to produce these colours. The *Revue des Arts Décoratifs* loudly protests, however, against this decision, which it qualifies as unpatriotic.

The Sèvres manufactory is a laboratory maintained out of the public funds, and if "secrets" are there discovered, it is only right that France should be the first to benefit from them. Formerly this principle was applied in an exaggerated manner, for even the French manufacturers were not allowed to imitate the Sèvres work. The reason given for this was the fear that the workmen, when once acquainted with the method employed, would be bribed by foreigners, and that other nations would profit by the discoveries made at Sèvres. These fears need not, however, have been entertained. The manufacture is too complex for a workman to understand all its details. The hours of baking, the composition of the enamels, the preparation of the kaolin, the proportional admixture of chemicals, the special form of the baking-stoves, the skilled manual work in forming the clay—all these are separate crafts in themselves. A manufacturer who spent several days at Sèvres might be taught by Mr. Lauth how to carry out in his own factory the new processes adopted; but naturally a foreign rival would not be allowed to participate in such lessons. By the publication in the *Official Journal* of the means employed foreigners will be able, however, to make at least bad imitations, which will injure the reputation of French wares. It would be better policy to keep the matter altogether a secret, or else allow foreigners not merely to read, but to see how the new colours are obtained. Such liberality could not fail to be appreciated by other nationalities, and France would have the right to expect some compensating advantage. It will be almost impossible to prevent imitations of the Sèvres porcelain, and, as these will as often as not be sold for real Sèvres, they should be as good as possible, or the reputation of the great State manufactory will be compromised. Secrecy in the nineteenth century is hardly practicable, and the authorities, making a virtue of necessity, would do well to place no restrictions on the publicity they intend to give to their recent discoveries. The whole world will be indebted to France if the manufacturers of china can be taught, by the example given at Sèvres, how to reproduce the rich tones that glorified ancient ceramic art.

THE MARBLE STORES OF ROME.

It will be remembered that about sixteen years ago a very large quantity of marble blocks, of the finest quality, was discovered at Rome. Pope Pius IX. made numerous presents of the marble found to various churches. The store of marble was discovered by Signor Visconti, the archaeologist, who carried on excavations with the assistance granted by the Pope, and received the title of Baron for his extraordinary success. The discoverer wrote at the time:—"There is an uninterrupted store of marble and alabaster blocks, of the rarest and most valuable descriptions, extending from Rome as far as the sea. I estimate the value of those blocks, which are only covered by a thin layer of earth, at several million francs. The stores became established in a very simple manner. The marble required for building at Rome, especially under the Cæsars, came from the African quarries, where the convicts condemned *ad metalla* had to work. Those blocks arrived dressed ready for use at Rome, where they were unloaded in the Emporium, whence they were taken as wanted. Whether there was an interruption in building operations or not, the marble blocks still continued to arrive, for the convicts had to be kept employed. When the Emporium became filled, the blocks were unloaded somewhat lower down the river, until at last the whole shore, as far down as Ostia, the harbour of Rome, became covered with them. They were never

removed. Who was to do it in that district bare of inhabitants, and at a period when the monuments of Rome itself were used as stone quarries? In time, during the decay of the empire and the irruptions of the barbarians, the marble blocks became covered with a layer of earth, and also partly sank into the ground by their own weight. Hence there is to be found there an extraordinary store of the most beautiful classic yellow and red marbles, the finest description of porphyry, &c." The work begun by Signor Visconti was most successful. It was discontinued because the marble first found had to be used. Soon after Rome was occupied by the Piedmontese, who had their hands full for a time in establishing themselves in the Eternal City. But now there appears to be every probability that those important stores of marble will at last be utilised.

THE COMPETITION FOR THE AMSTERDAM EXCHANGE.

The *Wochenblatt für Architekten und Ingenieure* lately published the details of the above international competition, for which designs must be sent in before May 1st, 1884, at Amsterdam. There will be a general and a select competition. For the former there are required a plan of the situation (scale 1:500), two ground-plans, four views, one longitudinal section, and two cross sections (scale 1:200), besides an explanatory statement in Dutch, English, French, or German, but written in Roman letters. This competition is anonymous, and the jury will be international in its character. The ten best designs will be selected and will each be remunerated with 800, the plans becoming the property of the city. Five of these will be admitted to the final competition, and an exhibition will take place for fourteen days of all the plans received.

The definite building programme will then be drawn up by the jury, and the five competitors will be remunerated after the ensuing decision in order of merit, with 8000, 5000, 4000, 3500, and 2500, the designs becoming the property of the city. Unless any important reason exists for not doing so, the author of the best design will be entrusted with the execution of the work at a remuneration to be arranged. If he is not entrusted with it, he is to receive a certain sum beyond the 8000 as compensation. The exchange-room will have a superficial area of about 32,000 square feet. Further details can be had from Secretary Neufville, Kantoor van de Burgemeester und Wethouders van Amsterdam.

THE COMPETITION FOR THE STOCKHOLM MUSEUM.

The administration of the Northern Museum at Stockholm issued in February, 1883, a programme for the erection of a new building. The participation of architects has, however, not been upon the anticipated scale of importance; this fact being attributed by the *Deutsche Bauzeitung* to the limited time and the small value of the prizes offered. Sixteen projects were received: eight from Sweden, one from London, one from Vienna, one from Prague, and five from Germany. The highest prizes were awarded to three of the last-mentioned five designs, which, it is remarked, is gratifying to the profession in Germany.

A Matter of Public Convenience.—At the meeting of the Paddington Vestry on Tuesday last (March 4) Mr. Mark H. Judge proposed the following resolution, which was carried by a large majority, viz.:—"That in the opinion of this Vestry it is highly desirable that public lavatory accommodation (with w.c.s, &c.) for both men and women should be provided for the use of every part of the parish; and that a special committee of ten members be appointed to consider and report as to whether this accommodation cannot be provided in such a way as to be a boon to the immediate vicinity in which it is placed, instead of being a nuisance, as must be the case, more or less, where structures for this purpose are erected in the centre of the public thoroughfare." A committee was at once appointed to carry out the resolution. We hope other vestries will follow suit.

MEDIEVAL WROUGHT IRON-WORK.

HADDON HALL.—YORK MINSTER.

We give this week two examples,—memoranda they may be considered by those who already know them,—of the free and effective treatment of wrought-iron characteristic of mediæval work of this kind. In both examples, the fire-dog from Haddon Hall, and the door from York Minster,—no attempt is made at the symmetry which a classic or Renaissance worker would probably have considered a *sine quâ non*; they are free sketches in metal, carried out in accordance with the immediate impulse of the workman. They are reproduced from pen sketches by Mr. W. R. Lethaby, as free and masterly in their way as the work they represent.

ST. NICHOLAS CHURCH, BLAKENEY.

THE view which we give of the interior of this fine church shows it as it is intended to be when the restoration and the clearing out process, which is now in hand, is complete. The following extracts from the report of the architect, Mr. H. J. Green, A.R.I.B.A., of Norwich, will give an idea of what is required and proposed to be done.

"The roofs require to be dealt with in the first instance, owing to their decayed and dangerous state, and it would be undesirable to leave them until other works have been done. To carry out this work satisfactorily, it will be advisable to strip off the old lead, which is in very bad condition, one bay at a time, and recast it, making good the deficiency with new; the timbers require to be reframed and strengthened where necessary by splicing and halving the decayed ends.

The windows in many instances require considerable repair by cutting out the old and defective stone cills, jambs, and tracery, and replacing the same with new masonry, and filling the openings with cathedral glass worked in local quarries. Such works having been completed, before touching the interior of the church it would be better (if funds will allow) to deal with the outside fabric, such as repairs to buttresses, copings, the re-facing and re-pointing of walls which are subject to the action of the weather, the removal of soil from the foundations, the formation of an open channel brick gutter set in cement to carry away the water from the new rain-water pipes leading from the roofs, instead of allowing it to percolate into the foundations, which is the cause of many settlements.

The tower next requires attention; the masonry in several instances is so loose that periodically the stone quoins of the buttresses are actually removed from their places by the force of the wind, the outside face of the walls must be carefully re-pointed, and all cracks grouted in with liquid cement, and the inside faces rough plastered; the belfry and bell-framing have especially suffered by the continual rain being blown in for the want of proper tracery in the windows and protecting louvres. The lead work of the roof is worn into holes, and the timbers decayed, as are also the beams to the two floor stages; the parapets are loose, and require some little looking to. It would add immensely to the general appearance if the four pinnacles were replaced in their pristine position.

In proceeding to restore the inside fabric, the wall-surfaces and stonework must be relieved of its many coats of whitewash, the latter carefully scraped, cleaned, and made good where defective, the walls re-plastered, and finished with stucco.

The fittings,—that is to say, the west gallery and the old square pews,—must be entirely removed, the floors taken up, and the passages laid with tiles. These spaces are proposed to be covered with wooden blocks on a bed of concrete (no more expensive than the ordinary floor,—the chief object in using these blocks is to avoid noise).

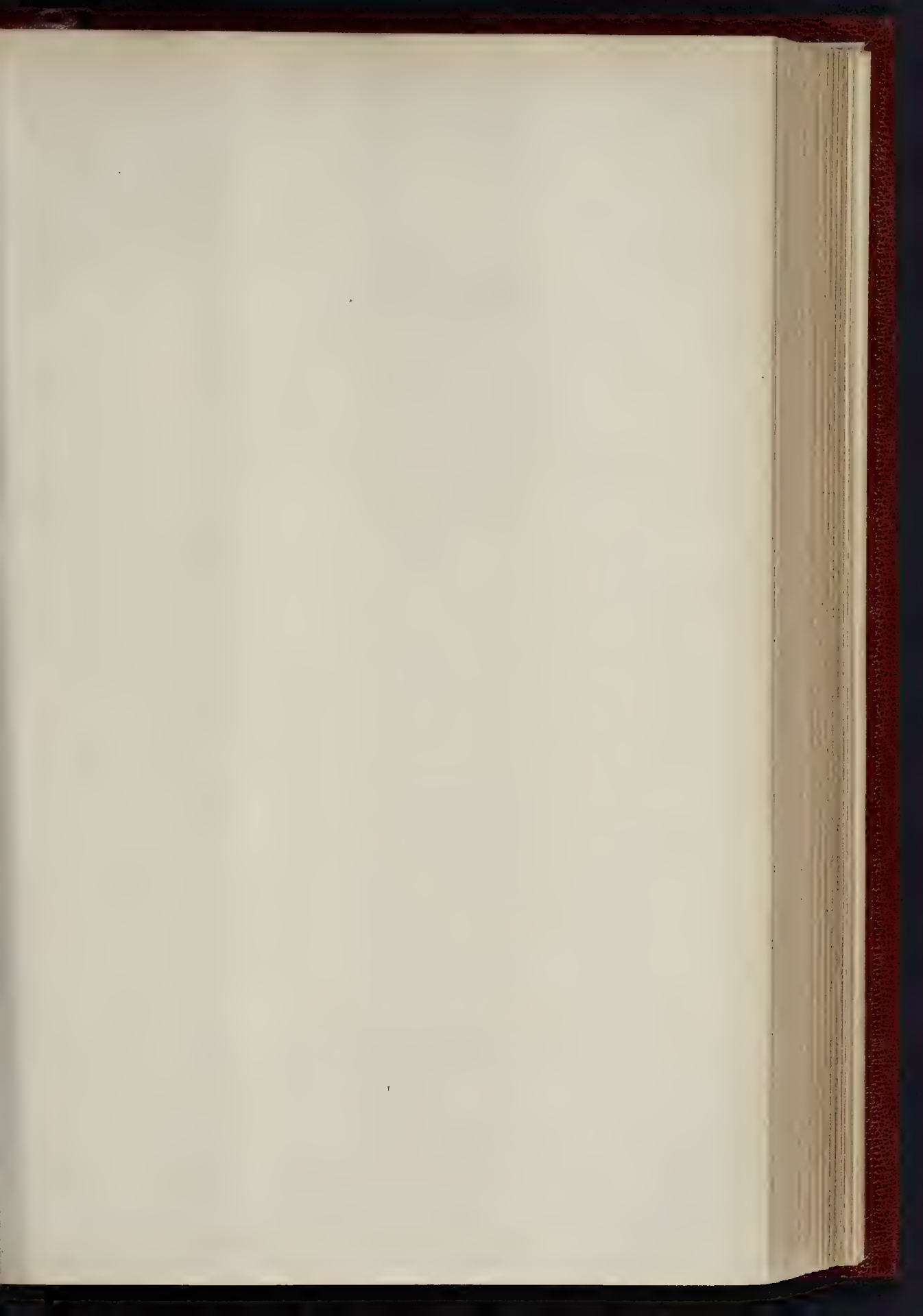
The old carved bench-ends are in a sufficient state of good repair to be re-used, substituting new framing for the backs and seats.

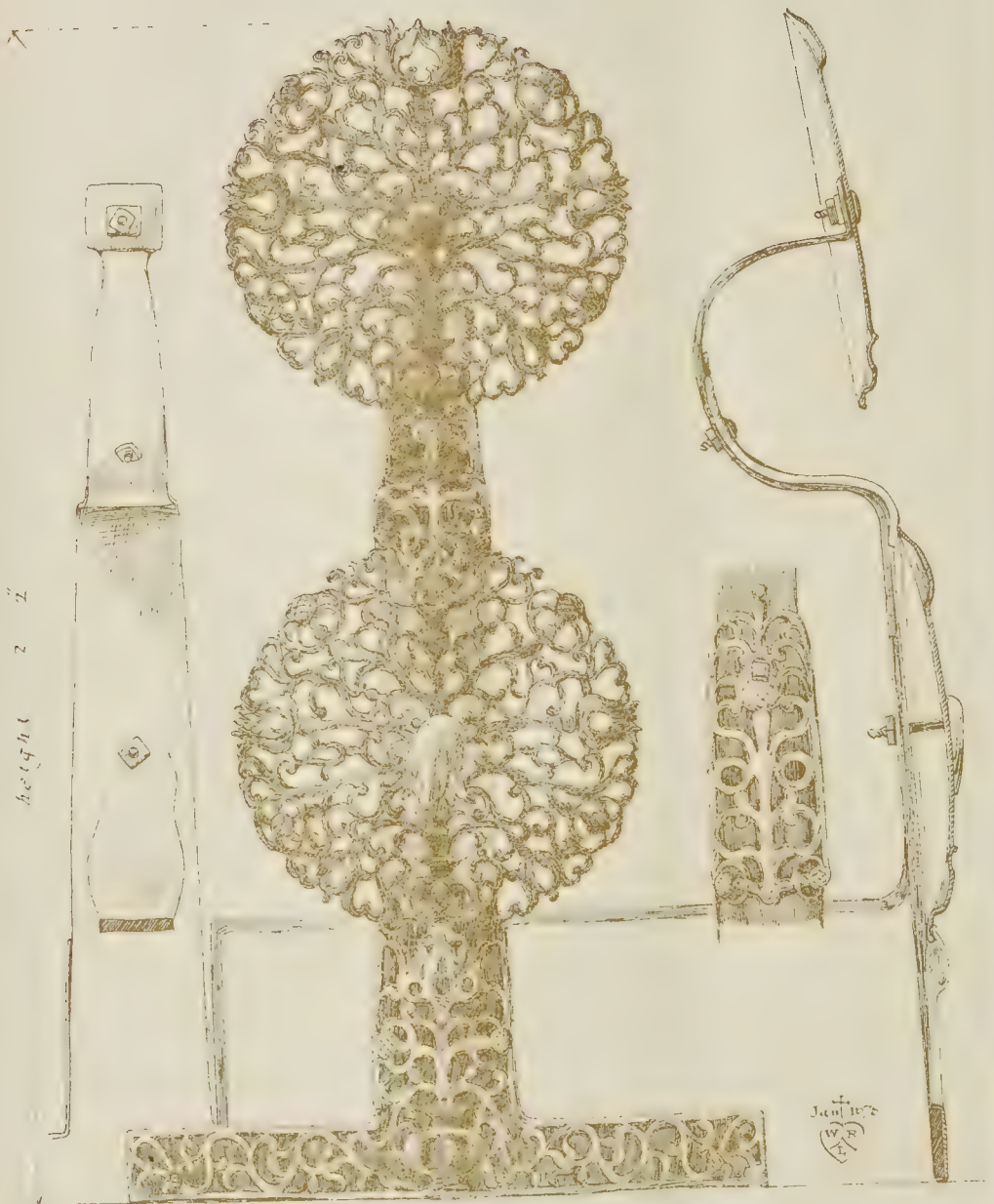
The old miserere stalls and carved tracery should be preserved, and placed in the chancel for the use of the choir."

The repair of the nave and aisle roofs is now proceeding, at a cost of about 2,000. The roof, as will be seen, bears considerable resemblance to the well-known timber roof of Trunch Church, in the same county.

THE PROPOSED MONUMENT TO VICTOR EMMANUEL.

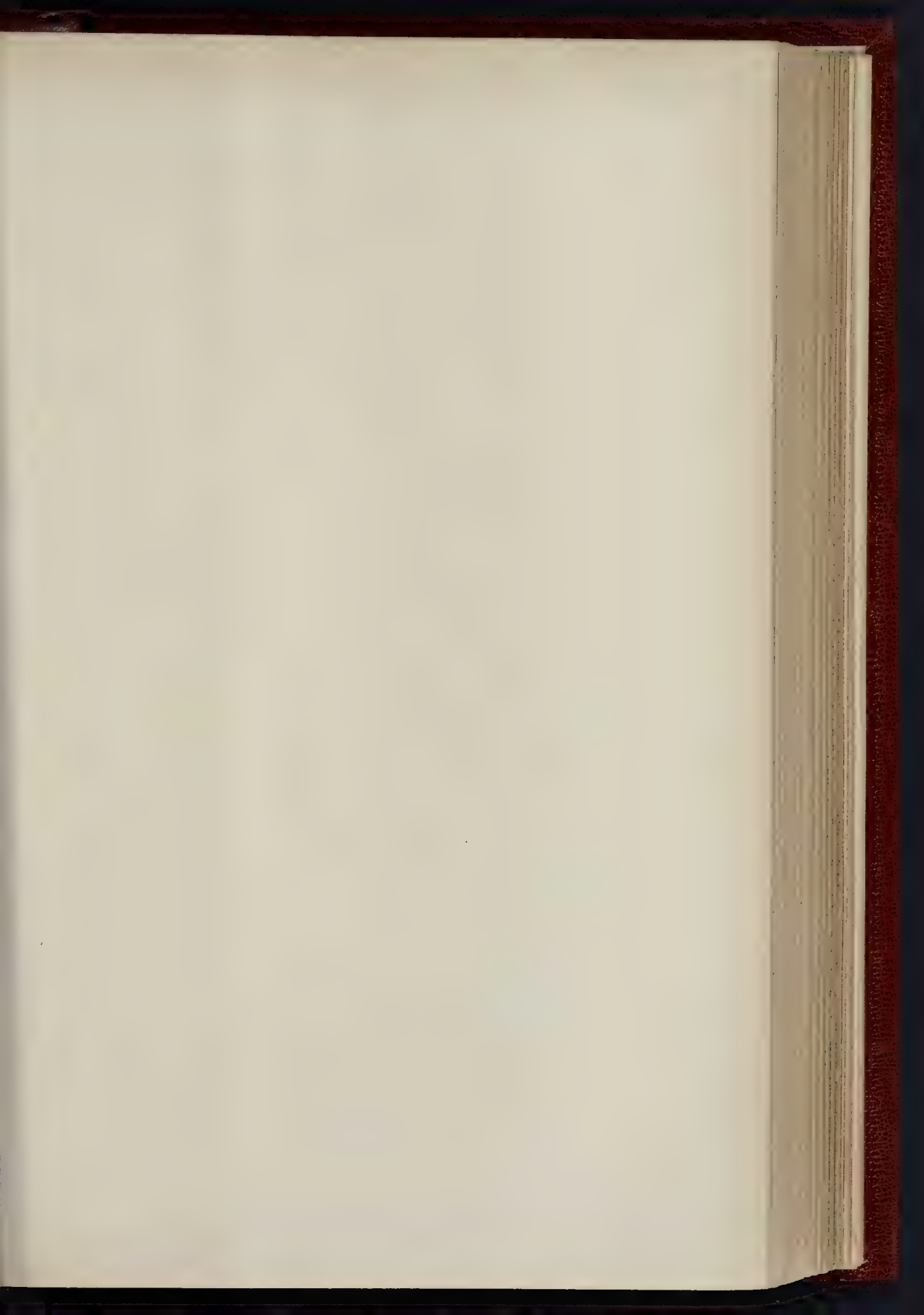
WE give engravings of two of the designs which received premiums in this competition; some general remarks on the whole collection (which included ninety-eight designs) will be found on page 143 ante. We shall give another of the designs next week. As to the actual execution of any design no decision appears to have been arrived at as yet.



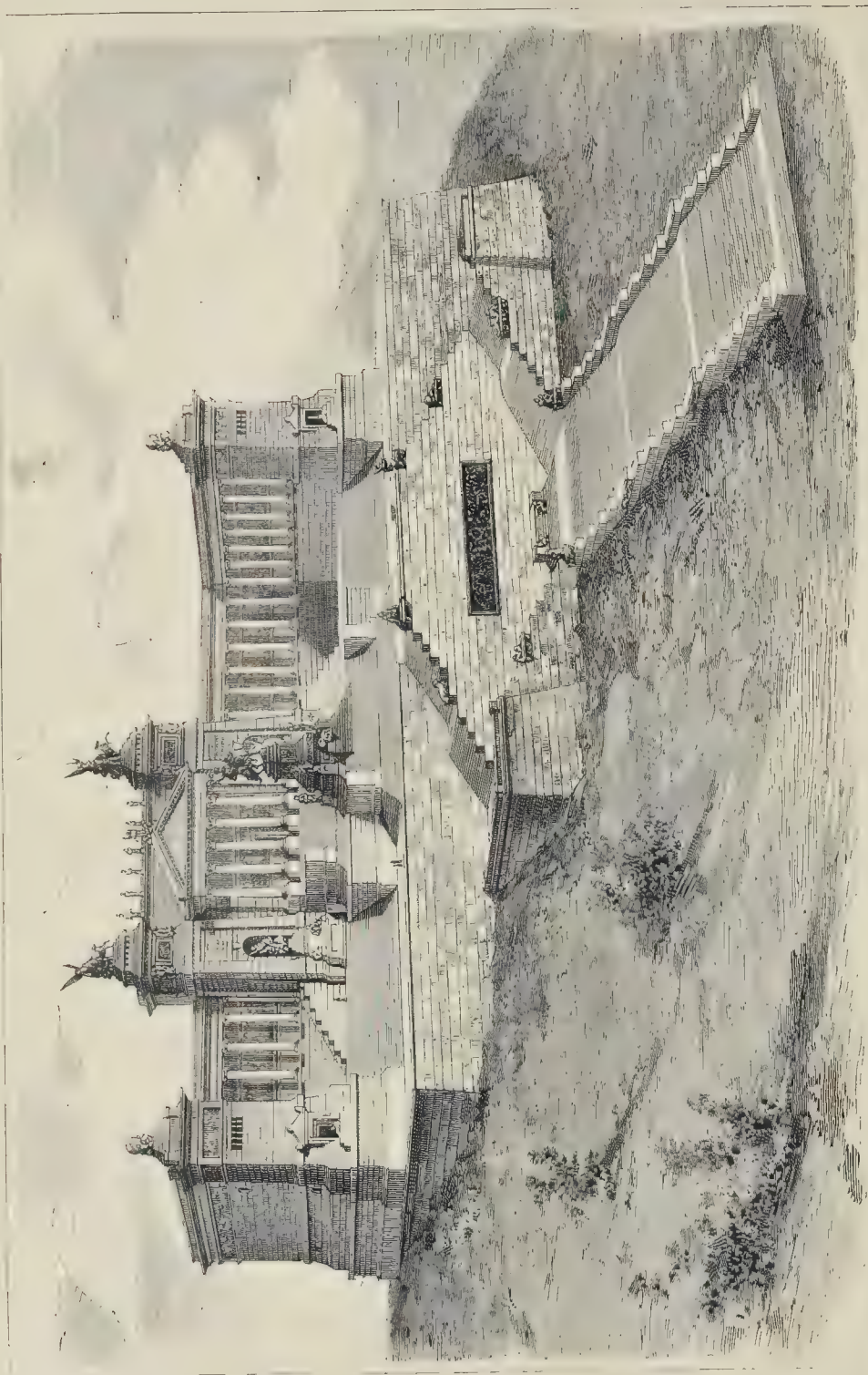


Designed by W.B. Lethaby

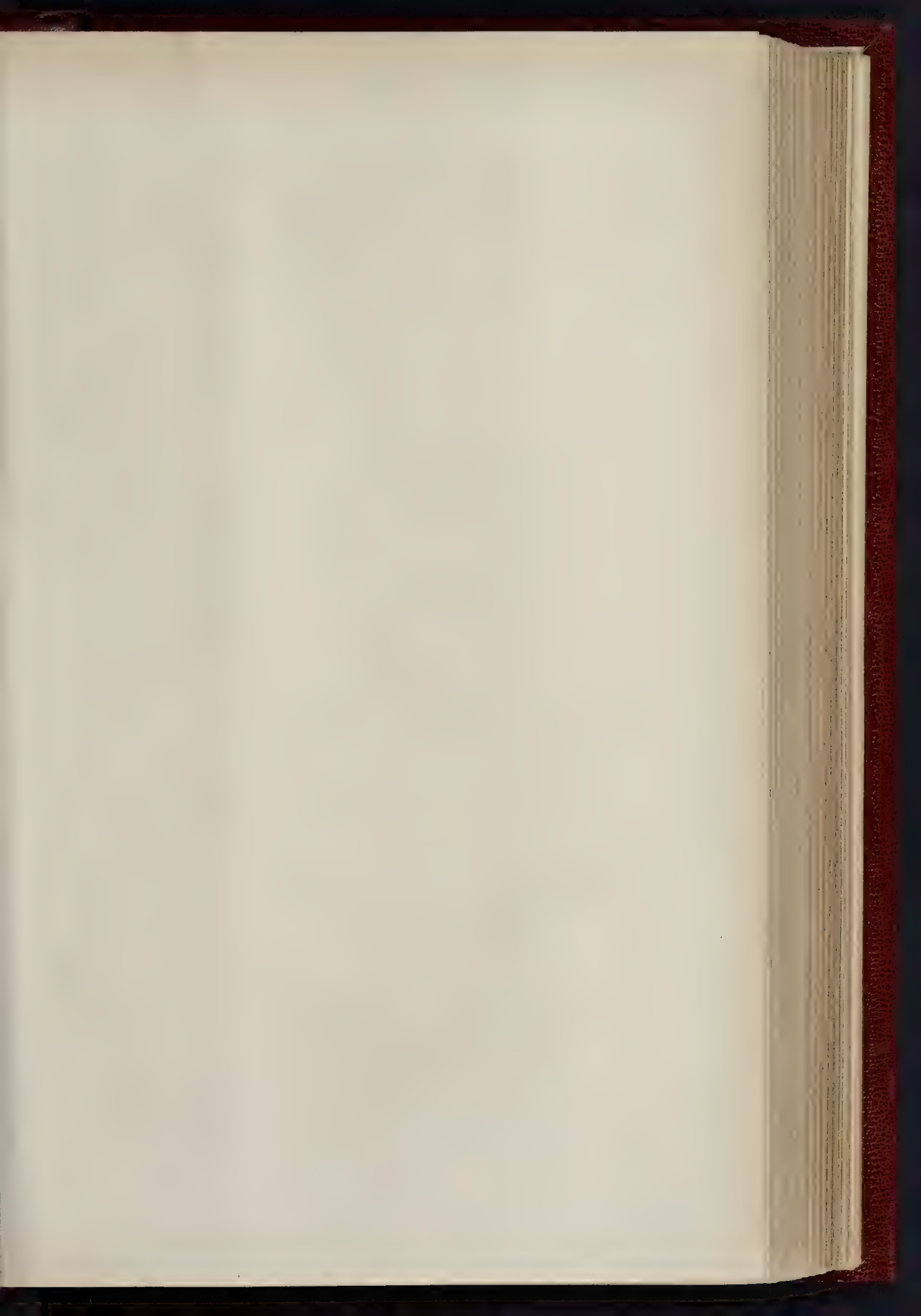
MADDON HALL FIREDOGS IN WITHDRAWING ROOM



THE BUILDER, MARCH 8, 1884.



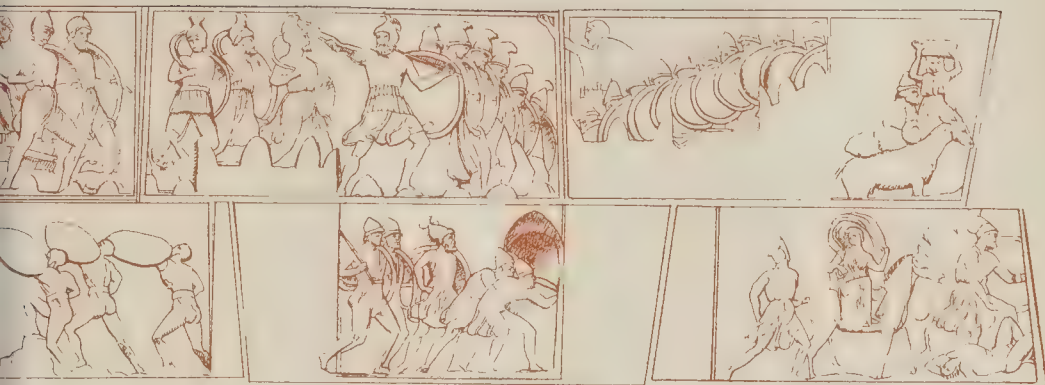
COMPETITION FOR THE MONUMENT TO VICTOR EMANUEL AT ROME.—DESIGN BY M. BRUNO SCHMITZ.



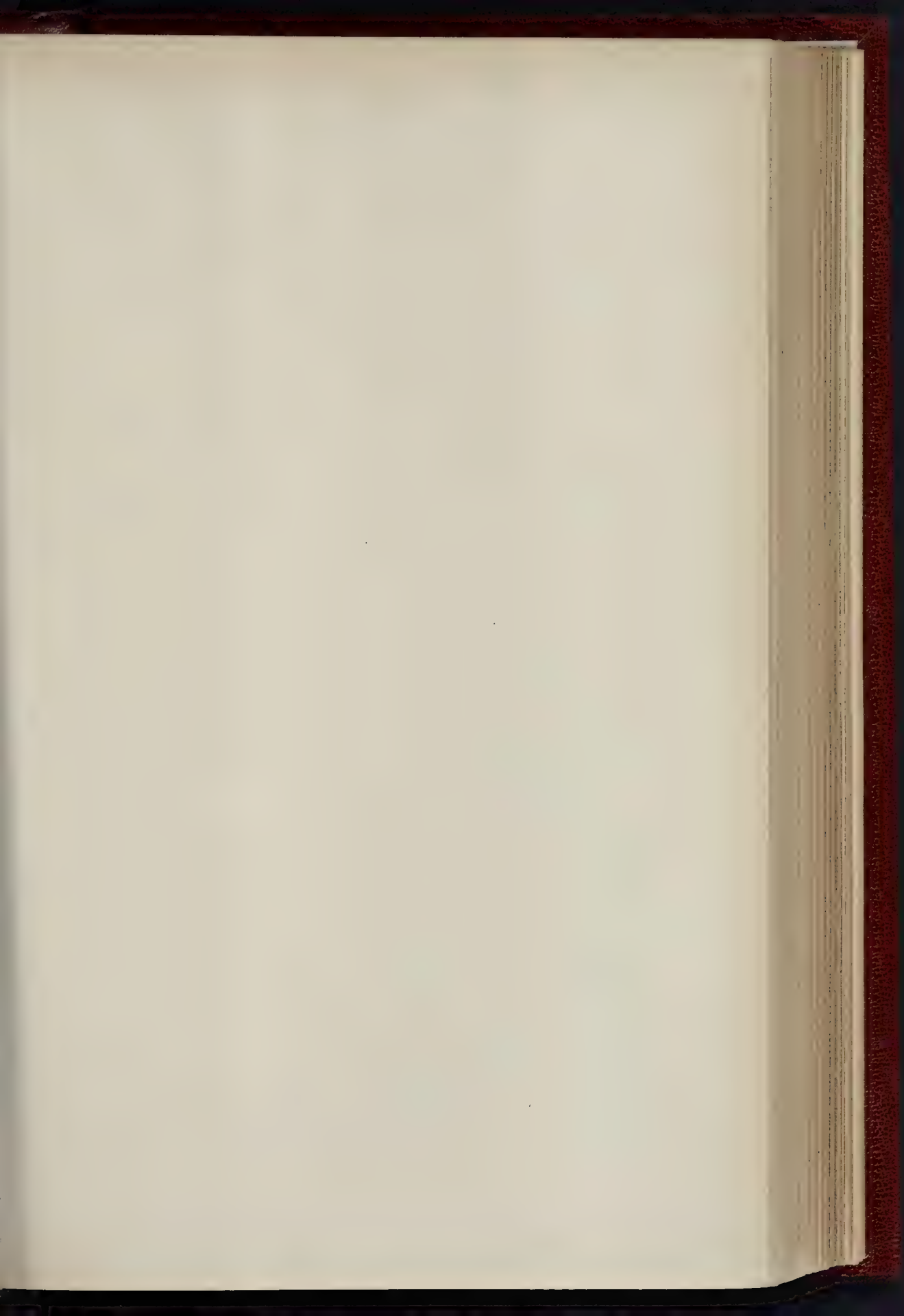


South East View

from the "Archaeological" 1907, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000



THE TOMB AT DJÖLBASHI IN LYCIA
illustrating the second lecture given at
THE ROYAL ACADEMY February 25 1884
by Professor C. T. NEWTON C.B.



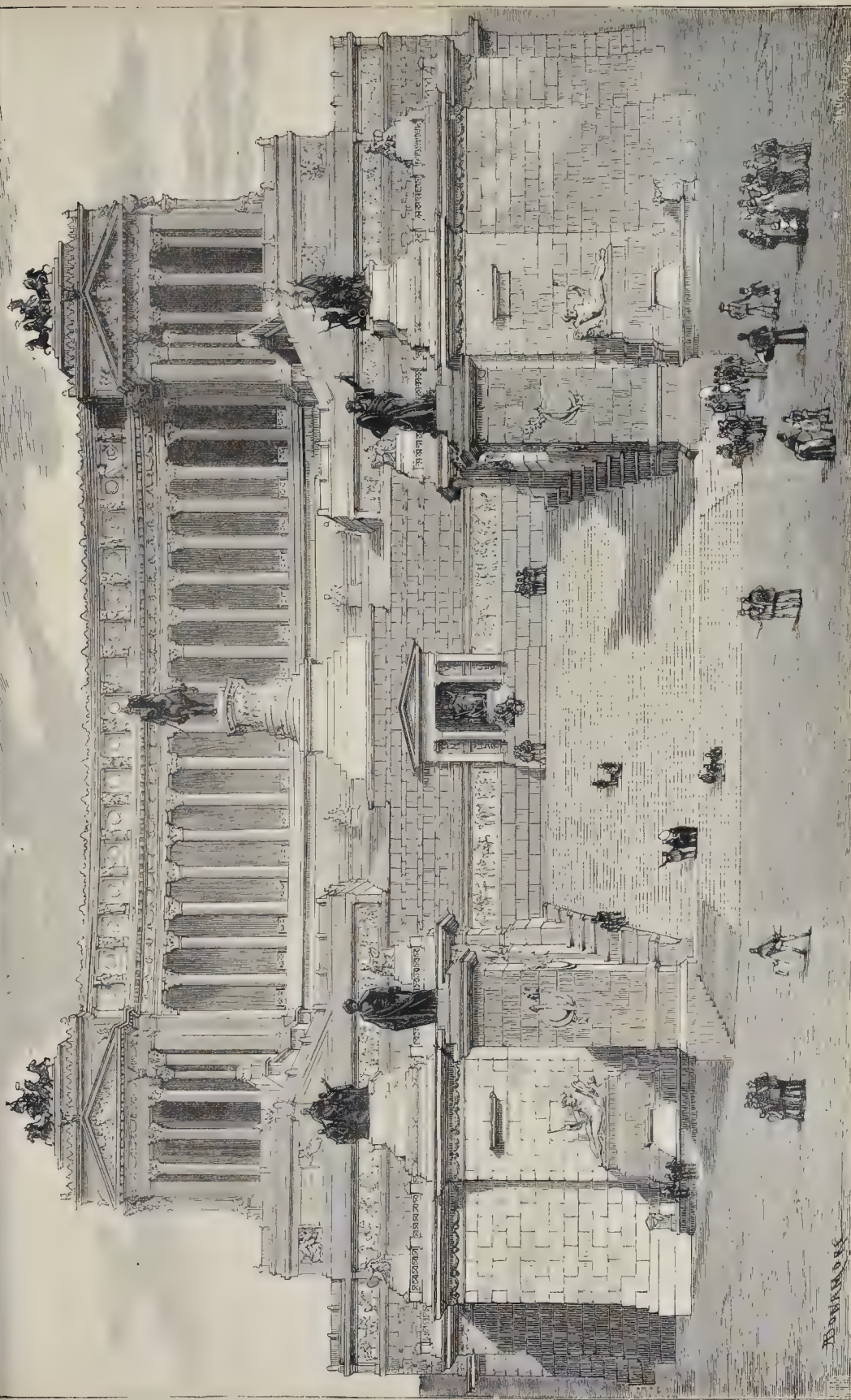
THE BUILDER, MARCH 8, 1884.





BLAKENEY CHURCH, NORFOLK.—INTERIOR LOOKING WEST, SHOWING PROPOSED RESTORATION.

Harbor: J Green Arch. West



COMPETITION FOR THE MONUMENT TO VICTOR EMANUEL AT ROME.—DESIGN BY SIGNOR GIUSEPPE SACCONI.

ROMA



Designed by W. R. L. Stothard

YORK CATHEDRAL: IRONWORK ON CHAPTER HOUSE DOOR

ANCIENT SCULPTURE.

ROYAL ACADEMY LECTURES.

In his previous lecture at the Royal Academy* Professor Newton, C.B., traced the history of Greek art, its rise, growth, and decay, and spoke of the manner in which it had been unearthed by archaeologists of various ages and countries from the grave which hid it from view. On the evening of the 28th ult. he dealt with the period from 1850 to the present year, a period distinguished by the variety and success of expeditions for the discovery of ancient art. England, France, Italy, and Germany all took part in these enterprises, and we must add the discoveries of Schliemann and Cesnola, who have contributed to this great object by private enterprise. The researches made in these expeditions extend over a large portion of both the western and eastern Mediterranean, from Bengazi in the Pashalik of Tripoli to Asia Minor, from Rhodes to the Crimea,—in fact, over the whole area of civilised Hellas. Dividing the period of thirty-three years into decades, the lecturer dealt first with the discoveries made between 1850 and 1870. In 1855 he was himself sent on an expedition to Budrum, on the west coast of Asia Minor, in the course of which he found the Mausoleum at Halicarnassus, the colossal lion on the statue of Demeter at Onidos, and the archaic statues at Branchidae. Between 1860 and 1870 a most interesting series of sepulchral monuments was found in Athens, in a place called Agia Triada. In the next decade, extending from 1870 to 1880, Mr. Wood ascertained the site of the Temple of Diana at Ephesus, and in the same period Mycene was explored by Schliemann, interesting discoveries were made on the southern slope of the Acropolis at Athens, and the Germans made an expedition to Olympia, which was remarkable for its perfect organisation and the self-sacrifice on the part of the German people with which it was carried out. In the same period we have a French expedition to Delos, an Austrian expedition to Samothrace, an American expedition to Assos, and a German expedition to Pergamum. Remarkable discoveries were at the same time made in Cyprus by Cesnola. Finally, discoveries were made in Lycia, including the exploration of the remarkable monument at Djoblhashi, by Bendorff.

The discoveries at Branchidae, Olympia, and Mycene, and the statues found at Samothrace, Delos, and Samos, have added much to our knowledge of archaic art in the period from 600 to 450 B.C. From Olympia we gain a knowledge of the works of Psemetus, the great contemporary of Pheidias, who is mentioned by Pausanias in connexion with the sculptures in the temple of Zeus at Olympia. The pedimental sculptures of Psemetus, and those attributed to Alkamenes in the opposite pediment, are, however, not worthy of the reputation of either artist. The Nike, the chief work of Psemetus, independently of its artistic merit, has a peculiar value, because the inscription on its base records the name of the sculptor.

Winckelmann, who had never seen the works of the time of Pheidias, formed his ideas of the style of Praxiteles and Scopas, the successors of Pheidias, in the fourth century B.C., from copies of their works in the Roman Museum. But recent discoveries have taught us the general characteristics of these two great sculptors. We have an excellent example of the art of Praxiteles in the statue of the god Hermes holding the infant Dionysus, found in the Heron at Olympia. The sculptures of the Mausoleum are inspired by the genius of Scopas, and we may assume that the friezes were the work of his school. Praxiteles and Scopas were followed by Lysippus, of whose sculptures we have no certain example, as he worked in bronze, not marble, and the finest works in bronze were carried off by the Roman Proconsuls, and afterwards melted down in conflagrations. We know, however, that in his time a reaction took place in favour of realistic sculpture, and his brother Lysistratos is said to have been the first to make a study of a man's face from a cast to nature. Examples of this realistic tendency may be recognised in the bronze head of a boxer found at Olympia, the head of an African found at Cyrene, the marble statue of the boy extracting a thorn from his foot in the British Museum, all which works are remarkable for their truth to nature and vigour of conception. Recent discoveries have also filled in some

great gaps in the history of the Macedonian or Hellenistic period, formerly one of the obscurest phases of Greek art. The Victory at Samothrace, and the reliefs from the altar at Pergamum are so many new lights thrown on the art of an age of which hardly anything was known except the statement in Pliny that after the death of Lysippus there was a great falling-off in Greek art both in style and invention.

The lecturer then explained the order of discovery by a series of beautiful diagrams. One of these represented the site of a discovery made at Athens in 1863. Here a man digging in a vineyard came upon a piece of marble, which proved to be the top of a stele 20 ft. high. This led to the discovery of a row of tombs remarkable for their beauty. Other diagrams represented single sepulchral monuments. One of these commemorated an Athenian who fell in the battle of Corinth B.C. 396. Another showed the torso of Victory from Samothrace, which resembles the design on the silver coins of Demetrius Poliorcetes, namely the prow of a ship with a Victory standing upon it. The remains of this statue were found by the French; and Conzé afterwards explored the island, and discovered some large blocks of marble, which, on being put together, made the prow of a ship. The French exported these remains to the Louvre, and appropriating a whole court for the purpose, built up the blocks in their original form as a prow, and placed the Victory upon it. On another diagram was a restoration of the Greek altar at Pergamum, a great building having two wings with porticoes, and a flight of steps between them. In the diagram smoke is seen ascending from the sacrifice. This altar is mentioned only once in history, and then by an obscure author called Ampelius, who wrote a work on the Wonders of the World in the second century A.D. It was probably built in commemoration of the victories which Eumenes II., king of Pergamum, gained over the barbarians. Another diagram represented a portion of the frieze which ran round the colonnade of the temple, portraying the Battle of the Gods and Giants, in groups of heroic size. This discovery is due to Mr. Humann, a German engineer, who, when travelling in Asia Minor, came to Pergamum, and here found enormous pieces of sculpture built into Byzantine walls. He took them to Berlin, when the mortar was cleared away, and the many fragments were fitted into their places. What strikes us most in this frieze is the strongly-marked expression of passion which is shown us in the faces. Many people think Greek art too cold, and do not appreciate the desire of the Greeks to maintain a balance of expression in which no human passion is allowed to interfere with the dominant beauty of the whole. Those who are in quest of the sensational in art will be gratified by the wonderful amount of expression exhibited in the Pergamene compositions, although the overcrowding with extravagant draperies shook an eye trained in the school of Pheidias. The emotional character of Pergamene sculpture may be partly due to the influence of the more fully-developed schools of painting of the century. When we study the Laocöon in connexion with the great Pergamene compositions, we see how evidently it is derived from a kindred source, and we can no longer regard it as an isolated phenomenon. The group in the Ludovici Villa, formerly called Arria and Psetus, and the Dying Gladiator, represent an earlier stage of the Pergamene school.

In conclusion, the lecturer spoke of a tomb discovered near Myra, in Lycia, by Schönborn, in 1842. It consists of a peribolus, or walled precinct, within which is an enormous sarcophagus. It remained unexplored until two years ago, when the Austrians sent an expedition to the place, and carried off about 300 ft. of frieze. Picturesque views of the gateway illustrated this portion of the lecture, and photographs showed the walls crowned with a double frieze, which represented many mythical subjects. In the composition of these friezes there is this peculiarity, that the whole action, for the most part arranged in two parallel lines, is continued through both friezes in places. Among the subjects are Ulysses slaying the Suitors, and the Hunt of the Calydonian Boar. A variety of other myths are shown, which apparently have no connexion with each other, and we cannot detect in their selection that chain of mythical affinities which is found in the odes of Pindar. These Djoblhashi monu-

ments, in spite of the injuries done to their surface, are superior to the Lycian monuments brought home by Sir Charles Fellows, which, although very interesting, are decidedly provincial in execution. The relief is so low, one can imagine that if the frieze were coloured it would look like mural painting, and it is suggested that the artists may have borrowed their conceptions from some of the works of Polygnotus and his contemporaries in the age of Pericles. If so, we have in this remote corner of Lycia sculpture which may serve to give us some idea of the great Athenian school of painters of the fifth century B.C., and shadows or reflections of works which the world may never hope to see in their original form. These Djoblhashi friezes have been thought by some German archaeologists to be as early as the fifth century B.C.; but Mr. Newton is disposed to think that they may be as late as the middle of the fourth century.

Having reviewed the principal discoveries which have taken place in the period 1850 to 1883, the lecturer expressed the hope that the next decade might be equally fruitful in the results of archaeological research. There was one particular discovery which it was his earnest desire should be made. That was the revelation to the public of those interesting portions of the Townley and Elgin sculptures, which have been buried in the vaults of the British Museum since the year 1850,—that is to say, during the entire period of the generation which has pursued archaeological research with such zeal and success elsewhere. He took this opportunity of publicly announcing that in October next he proposed to deliver at University College a course "On those Portions of the Elgin and Townley Collections in the British Museum which have been withdrawn from public view for many years."

[We give a small view of the remains of the Djoblhashi tomb (referred to above), and drawings of the greater part of the bas-reliefs, reproduced from Bendorff's work ("Archäologisch-Epigraphische Mittheilungen aus Oesterreich, 1883"), by the kind permission of Herr Bendorff, and of Herr von Gerold, the publisher (see lithographed illustration). Casts of portions of the frieze, including the "paraso" (see top line of illustration) are among the contents of the new gallery of casts at South Kensington which will shortly be open to the public.]

HOUSES IN FLATS.

ARCHITECTURAL ASSOCIATION.

We extract the following from the paper on this subject read by Mr. F. B. Eales at the Architectural Association last week. The whole paper was useful and practical; but most of the information on the American and French systems, dealt with in the earlier part of the paper, has already appeared in one form or another in our pages.

We have not yet developed in this country our appreciation of flats sufficiently to warrant the building of these suites upon the extensive scale on which some are now being erected,—that is to say, with any likelihood of their being occupied, for the general applicant for a flat seems to be one who is willing to expend say 150*l.* up to 200*l.* in rent. In extremely good positions, of course, such as Piccadilly, Park-lane, and a few other expensive localities, fabulous rents might be obtained; in fact, in Piccadilly, I am informed that a suite of three rooms and bath-room on the first floor fetch 400*l.* per annum, and two rooms and bath-room on the second floor 200*l.* per annum. Another point, in considering these lofty buildings, is the absolute necessity of travelling by elevator, which, although delighted in by our American friends, yet not one person in twelve over here cares about much. The outlay required to provide an elevator,—say, to serve six floors,—is between 400*l.* and 500*l.*; the wages of an attendant and the water-rate would bring the annual expense to about 800*l.*; it is a question, therefore, unless a building is more than five floors above the ground, whether this means of gaining access to the upper regions is warranted,—for in a building of the number of floors mentioned the same rent can be obtained whether this additional accommodation is provided or not. Another drawback to excessive altitudes is the proportionate bulkiness of the walls, which, as you know, are regulated

* See p. 297, ante.

in thickness by their height, the sacrifice of ground-area thereby, and the interference with free ventilation, and, most certainly, of light. Unfortunately, there is no restrictive power preventing a building going up to unlimited height in an old street which may be narrow into the bargain; but the 85th section of the Metropolis Local Management Amendment Act lays down the rule that no building in any new street of a less width than 50 ft. (except a church or chapel) shall exceed in height the width of the street without the consent of the Board of Works; in streets over 50 ft. in width there is absolutely no control as to height. The Metropolitan Building Act, however, carefully confines us to the superficial area, which, in the case of building flats becomes rather irksome. I allude to the 27th section, which will not allow you to build (if the area exceeds 3,600 square feet), without providing party-walls vertically and party-arches, and fireproof floors separating the different tenements. One of the essential points in the direction of these large buildings occupied by different families is, that they should be constructed of fireproof materials so far as is possible, and ready means of egress provided in case of necessity; so, perhaps the stringency of the Act in the way of precaution is not to be regretted. The most convenient form of plan for a site of ordinary dimensions is an elongated parallelogram, having front and back light; but it is so seldom that a straightforward piece of ground is to be had that it is rather futile to say what shape is most workable, as upon an ideal site an ideal plan could be arranged. A plan shown had 105 ft. frontage, with central entrance, the suites being entered right and left. Ample light is obtained both to back rooms and passages; this leaves three good rooms in front, consisting of dining-room, drawing-room, and best bedroom. The number of bedrooms mostly asked for is four, and in a family suite should be never less. To this add the kitchen and offices, bath-room, and two water-closets. This amount of accommodation seems to be all that is required by the ordinary applicant. The correct and best arrangement, where possible, is to have the bedrooms separated from the kitchen and servants' part by the reception-rooms. The kitchen should be in close proximity to the dining-room, for obvious reasons, and in these medium-sized suites it is well to provide a hatch between the two rooms, with small shelf, so that one servant may serve from the kitchen to the servant inside the dining-room. Some people are dreadfully frightened in case any smells of cooking should penetrate through this opening to the dining-room; but if properly attended to the danger of being objectionable can be overcome. The passages should be as wide as practicable, and never less than 3 ft. 6 in. clear, with light at end or side, so that the windows may be opened, and a current of fresh air admitted, and the whole suite kept pure and fresh. In these long frontages we must not forget that the Amendment Act comes upon us; until this came in vogue the Building Act, sec. 29, required only (as it does still in building upon old sites) an open area of 100 ft. super. in the rear or on the side of any dwelling-house unless otherwise lighted from a street or alley; but now, in the case of new sites, any frontage over 30 ft., according to the progressive scale laid down by the Amendment Act of 1882, must have an open space in the rear exclusively belonging thereto of 450 ft. super. If only six suites are required, a frontage of 37 ft. to 40 ft., and depth of 80 ft., will allow of a very workable plan. By having the entrance at the side you are enabled to obtain two good rooms in front, and keep the self-contained principle on each floor. In many buildings not only are the staircases dark, but the internal passages are without windows, or lighted from small well-holes. If you must have these wells, line them with white glazed bricks.

The staircase should be, as I have before mentioned, one of the first and principal points in a plan. How much more inviting is it to go into a building and find a bold, handsome staircase, well lighted, the stairs at least 4 ft. wide, of easy rise, the walls finished with some show of decoration, which, though not obtrusive, yet sufficiently attended to to give the visitor, as it were, an appetite for further exploration, than it is to find one's self, as in some cases, in a narrow, bare, dark, dreary passage, with a break-neck staircase, the walls simply distempered with a dark brown dado, or perhaps not even this, the hall finished with plain York

paving, and everything as cheerless as could be desired. Surely a little money in this direction is well laid out. In the staircases of many of the new flats in Paris you will find the walls panelled, and lined with polished marble slabs, the treads of the stairs lined with white marble, and carpeted, leaving the impression that you are in some private mansion rather than one occupied by some dozen families. The stairs should, of course, be of fireproof material, as is required by the Building Act (sec. 22), which demands that every building containing more than 125,000 cubic feet, and used as a dwelling-house for separate families, the floors of the lobbies, corridors, passages, and landings, and also flights of stairs shall be of stone or other fireproof material. In the flats known as Hyde Park Mansions,* they have been carried out in Portland cement concrete; in some instances the treads are cast separately, and pinned in after the walls have settled, the landings being pinned in and carried by light iron girders; in other instances they have been cast in whole flights *in situ*. A mould of the flight is carefully made and supported by struts, a chace for the end of each step being cut in the wall, and, when ready, the mould is filled and allowed to stand some three or four weeks and then removed, leaving a very clean staircase. This method is cheaper than fixing the treads separately, on account of the labour required in fixing, this material being very heavy and rather difficult to handle. The cost of the latter process is about 12s. per single flight of twenty steps and landing, as against 20s. if fixed separately. The treads are finished with a fine face, and, when thoroughly dry, have a clean appearance. To add to the lightness, glazed tiles have been inserted in the risers, which relieves the mass of greyish colour and gives somewhat of a finish to the whole. Lining the treads and landings with marble makes an excellent finish so far as appearance is concerned, but it necessitates carpets being used, otherwise a good deal of slipping about would be experienced and some few broken bones to mend. It is a moot question whether it is advantageous to carpet the staircase, as from experience we find that with even the traffic in an ordinary dwelling-house stair-carpets soon become shabby, and so the question is whether it is not better to leave the stone or concrete, as the case may be, in its bare state, taking care to have the strings and margins painted and the remainder kept as clean as possible. The landings in the staircases of the flats mentioned are finished with tiles in some cases, in others with tesserae, chips of marble, formed in patterns, which makes a clean and bright finish. In these flats I have endeavoured to add to the prominence of the staircase by providing a large landing on each floor, running from the stairs to the front of the house, with a glazed screen, in which can be introduced coloured glass, and which, if necessary, can be fitted up with settees or made useful in many ways, as well as being an aid to ventilation. Before quitting the staircase there is a point which also strikes me as being worthy of note, and that is the egress on to the roof. In almost every house you go into, you find that the way on to the roof is through a small trap-door in the top-floor ceiling, this averaging about 18 in. or 2 ft. square, scarcely large enough for a small man to get through, and very awkward for fleshy ones. After straining the muscles of your legs from standing on a rickety step ladder (which is not always forthcoming), you get into the roof, and by this time in a filthy condition. You now come to another trap-door, which in all probability you will find bolted, the bolts being rusty and refusing to move. This said trap is covered with lead to make things heavier, and by the time you get this open would be time enough (if there should happen to be a fire going on) for there should be an unfocussed everybody anxious to get out. To obviate this inconvenience I always carry out the following arrangement:—From the top landing, form a narrow flight of stairs with handrail and balusters, leading to a landing at top, and with a sufficient headway to stand up, say 7 ft., formed as a dormer to the roof; unlock the door and you are out, either in a gutter or on a flat, without trouble, inconvenience, or dirt, besides yielding an opportunity for householders to take a survey of their tiles or gutters and make themselves acquainted with what one in a thousand never

troubles his or her head about. The buildings in question are furnished with high-pitched roofs, with collars, leaving ample room to form cubicles, with a central passage: these are devoted to each tenant as a box-room, and are most convenient; the door leading to this part is shut at a certain hour, and each tenant is under certain responsibilities as to usage.

Secondary Stairs.—Most of the plans we have seen this evening have a secondary staircase provided for the use of servants, and it is essential that there should be a method of tradesmen communicating with the kitchens without using the principal staircase. There are many objections to its use, as being an incentive to misbehaviour on the part of domestics, as also a loophole for servants of other suites congregating and becoming a nuisance in more ways than one. The plan adopted in Hyde Park Mansions is to have a lift, say, 3 ft. by 2 ft. 6 in., serving each kitchen from the basement; and as the kitchens are all at the rear, the lift is out of the way. At the basement level is a pair of folding-doors open, and the lift is exposed to view. On one side of the opening is a list of the tenants with their respective suites, number, and floor, and a speaking-tube to the kitchen of each. The tradesman comes with his order, whistles to the cook, say, of No. E 2nd floor, she replies, the man puts his basket or what not in the lift, and pulling the rope the lift arrives at its destination, and when emptied comes down again to the basement. This arrangement has been in work some three years, and answers well enough at any rate for a substitute to the secondary staircase,—which means space, expense, and possible annoyance. There should be two water-closets to every suite; one can be in the bath-room,* if space is to be economised, and the other in the neighbourhood of the servants' part, and if possible, with a lobby to same open to external air. Be careful not to place a water-closet just as you enter the flat; contrive it where it will not be obtrusive, and by all means with a window to external air. All the soil-pipes should be carried down outside, and left open at top, and trapped at bottom; and be careful that any repairs to a tenant's pipes can be rectified from his own premises, without having to go into the suite above or below, as the case may be. Ventilate each apparatus by a pipe going up to the roof, deliver the rainwater pipes open on to siphon traps, turning the wastes from lavatory and bath into them; this simple system answers as well as can be wished. In the flats alluded to, we have a constant supply served by a 1½-in. rising main, running from bottom to top of building, with branches on each floor to the cisterns, with a draw-off at sink from the rising-main, and one from a cistern; the precaution for the two draw-offs being in case the constant supply should be stopped by reason of repair or accidents, when the supply can be obtained from the cistern in reserve. Each water-closet has a separate cistern. The baths are served with hot and cold, with circulating pipes from kitchen boiler in each instance; the lavatories being supplied from same source. This method of supplying hot water, totally distinct in each suite of rooms, is by some considered more agreeable than having furnaces in the basement, which supply the whole building, which in the case of medium-sized flats would be hardly of sufficient advantage to warrant this outlay. It is customary when there are furnaces, to have hot-air flues in the staircase walls, with hit-and-miss gratings, so that the hot air may be regulated both on the staircase side, and also in the private hall of each suite. It is only in the winter months, however, that the staircase requires warming, and when there is a plentiful supply of gasburners, which in the dark months are brought into requisition in the early morning and afternoon, the staircase becomes warmed without the aid of hot-air flues; this is the case in staircases which are 14 ft. by 10 ft.

Ventilation.—When the windows open to the open air, and each room has a fireplace and ventilator communicating with external air, there is every chance that the rooms may be kept fresh without calling in the aid of shafts and tubes and elaborate experiments which generally end by blowing one's head off, or being stuffed up to spite their inventor. To aid the idea of independent ventilation in these

* Illustrated in the *Builder* for August 4, 1883. Oxford and Cambridge Mansions, also by Messrs. Eales & Son, were illustrated in the *Builder* for February 3, 1883.

* We are surprised to find any architect recommending such an arrangement, even as an economy of space. It is most disagreeable, unsuitable, and uncivilised, and should not be allowed.—Ed.

buildings, the windows in most instances are carried out in the following manner:—The top sash is made to hang, and finished with casements underneath, which, when there is a balcony provided, are of much more convenience than the double-hung sash. By this means the top sash is opened at pleasure, and in the summer the casements can be thrown open, thus gaining the advantages of each. Following on ventilation we come to the means of getting rid of the dust and rubbish accumulating daily. This is done by making use of a flue provided in the neighbourhood of each kitchen, fitted with an iron door and cheeks, with india-rubber rabbeted rim, so that it may be kept air-tight. This flue communicates direct to the basement, where there are large receptacles sunk below the yard level which are emptied twice a week. This saves a great deal of trouble in carrying the refuse down or sending it in the lift. The place is thus kept sweet, and the process of collecting being carried out in the early morning, does away with a possible nuisance.

Internal Finishings.—The two principal rooms should be so arranged that they can be thrown into one, as occasion may require, which can be done by one of three ways: by having folding doors, sliding doors, or revolving wooden shutters. The drawback to the first is that so much room is taken up when folded; the second destroys the walls; and the last is cumbersome, as the boxing must show below the ceiling line, and when finished looks anything but well. The Americans patronise the sliding doors, which is certainly the most convenient arrangement. The rooms should not be too lofty, on account of the expense, unless the duplex system is required, when it necessitates having the front rooms 14 ft. at least, the average height for the best floors 11 ft., finishing with 9 ft. at top. This height enables you to get ample window light. The interior of rooms is improved by introducing bay windows, either circular, splayed, or square: the preference is generally given to the circular. These windows, as well as tending to the appearance internally, help to break a monotonous elevation, especially if balconies are provided to the principal rooms,—a feature which forms a substantial item towards letting purposes. These balconies give the tenant (if he is some distance up from the earth) the opportunity of feasting his eyes upon flower-boxes, which will not only make his own rooms pleasant, but will make up to him partly the lost pleasure of seeing what is going on in the lower regions, which, at the second floor of a lofty building, he could not do unless standing on the balcony. The principal rooms should have speaking-tubes provided, communicating with the kitchen, which should be fitted with as many cupboards as can conveniently be obtained. The coal-bunk need not be large, as it can be replenished from the vaults in basement which are allotted to each tenant. The ladder should be placed so as to get external air; all the necessary fittings for kitchen and scullery purposes provided. Each entrance-door should have number, with bell, with letter-box, and private latch to door. In place of the French *concierge* or the American janitor, either of whom requires two rooms at least allotted to him, and either of whom is an expense, two have substituted a small tablet in the entrance-hall of each block of flats. A neat tablet is fixed on each side of the entrance-hall, with the names of the tenants printed thereon, with their corresponding number or letter and floor. In a line with the name is a slip with "in" or "out," which can be manipulated at pleasure, enabling the tenant to let any caller know if he is within or not, thereby saving the visitor the trouble of travelling up the staircase, perhaps to be disappointed. As each suite is entirely self-contained, with a separate entrance-door, there is no necessity to lock the main entrance-door, which can be opened by any one up to a certain hour, after which each tenant uses a pass key. This arrangement meets every requirement. If any special inquiry be needed, the applicant simply adjourns to the manager's office, or consults porters, who patrol the buildings without intermission day and night, who are more alert, and therefore more useful as custodians, than the *concierge*, who remains at his post as a fixture. With the exception of gas (each tenant having a private meter), everything is provided in these flats, the use of telephone included, the tenant simply paying his quarterly rent.

It would be a mistake to pass over a point connected with flat-building which has forced itself

upon the notice of many, especially as we are now considering the propriety of developing buildings arranged in flats. I allude to the extensive and expensive buildings which are now going up arranged as flats, for which rentals must be paid to recoup the investor larger than there is any likelihood of obtaining. A man of ordinary income thinks, upon seeking a house, that a rent of 150*l.* per annum is (and he is right) a sufficient sum to pay for being housed; add to this another 50*l.* for rates and taxes, making roughly 200*l.* per annum. How many men can afford to pay this sum in rent? Those who can mostly prefer having a house to themselves rather than a flat; yet we see and hear of suites starting at rents of 500*l.*, and going up to much larger figures. This is a mistake: those who require flats are those enjoying moderate incomes, and require to economise what they have. If suites can be obtained from 100*l.* to 150*l.*, then the new system is likely to be patronised; but so long as buildings are erected in an extravagant manner, regardless of what people are able to pay, then surely some of these undertakings which are now in hand will stand idle.

[Some notes of the discussion that followed the reading of the paper are deferred until next week.]

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MEALS AND PRIZES, 1884.

At a special general meeting of members, held on Monday evening last, Mr. Horace Jones, President, in the chair, the principal business was to consider the award of the Royal Gold Medal and other medals and prizes for the present year.

The Royal Gold Medal.—The following resolution, moved by the President, was carried by acclamation, namely,—“That, subject to her Majesty's gracious sanction, the Royal Gold Medal for the year 1884 be presented to William Butterfield, architect.”

The Tide Prize (value 30*l.*). Subject: Entrance Hall and Staircase of a Royal Palace. (Eight competitors.) Awarded to the author of the design bearing the motto “Forest R.I.B.A.” (Mr. Edwin William Peley, of 46, Lady Somerset-road, Highgate). In the same competition a Medal of Merit and the sum of ten guineas were awarded to the author of the design bearing the motto “Never venture, never win” (Mr. John Alexander Campbell, of Glasgow, and 4, Rue Saint-Roch, Paris).

The Grisell Gold Medal.—Subject in iron construction.—Central Hall of a Fruit and Vegetable Market. The Secretary announced that no design had been submitted for this medal.

The Soane Medallion and 50*l.*—Subject, a Theological College for Thirty Students (eight competitors). Awarded to the author of the design bearing the motto “Sedes sapientie” (Mr. John Oliver Harris, of 83, Orlando-street, Bolton-le-Moors). In the same competition a medal of merit was awarded to the author of the design bearing the motto “Dignitas” (Mr. Herbert Osborn Cresswell, of 19, Queen Anne's-gate, S.W.).

The Institute Medal and Ten Guineas: Drawings. Measured drawings of old buildings. (Six competitors.) Awarded to the author of the design bearing the motto “Thistle” (Mr. Andrew Whitford Anderson, of 46, Warwick-gardens, Kensington), for his drawings of Ely Cathedral. In the same competition it was also resolved that the Institute Medal be awarded to the author of the design bearing the motto “Je persévère” (Mr. Arthur Needham Wilson, of 23, John Dalton-street, Manchester), for his drawings of West Walton Church, Norfolk; and that a Medal of Merit be awarded to the author of the design bearing the motto “Nil Desperandum” (Mr. John Robert Sutton, of 6, Checker-street, King's Lynn, Norfolk), for his drawings of Terrington St. Clement's Church, Norfolk. Further, that a Certificate of Honour be awarded to the author of the design bearing the motto “Estroviaard” (Mr. Arnold Bidlake Mitchell, of 36, Pembury-road, Clapton), for his drawings of Shoteshbrooke Church, Berkshire; and that a Certificate of Honour be awarded to the author of the design bearing the motto “Effort” (Mr. Henry Downs, of 2, the Elms, Beverley-road, Hull), for his drawings of the south transept of Beverley Minster.

The Institute Medal and Ten Guineas: Essays. Subject, “Staircases.” (Four competitors.) Awarded to the author of the essay bearing the motto “A vaillans Cours rien impossible” (Mr. Thomas Parves Marwick, Associate, 1, Spottiswoode-street, Edinburgh).

The Building of Town Houses.—Mr. Edis delivered the third and last of his series of Cantor Lectures on this subject in the Hall of the Society of Arts on Monday evening last. We are obliged to hold over our report until next week.

THE HOSPITALS ASSOCIATION.

The first Council of the Association has been constituted as follows:—

Vice-Presidents.—The Right Hon. Lord Alcester, F.R.S.; Sir T. Fowell Buxton, Bart.; Sir Andrew Clark, bart., LL.D., M.D.; Major Ross, M.P.

Council.—The Right Hon. the Earl of Cork and Orrey, K.P.; Viscount Powerscourt, K.P.; Sir Rutherford Alcock, K.C.B.; Mr. H. W. D. Acland, M.D., C.B., D.C.L., F.R.S.; Mr. William Bousfield; Mr. J. S. Bristowe, M.D., F.R.S.; Mr. Henry C. Burdett; Mr. J. H. Buxton; Mr. M. D. Chalmers; The Rev. Canon Erskine Clarke, M.A.; Mr. Frederick Cox; Mr. W. H. Cross; Mr. H. N. Custance; Mr. R. Farquharson, M.D., M.P.; Mr. Timothy Holmes; Mr. R. Benson Jowitt; Mr. G. B. Lloyd; Mr. R. H. Lloyd, M.D.; Mr. Charles Macnamara, F.R.C.S.; Mr. Malcolm Morris; Mr. C. T. Murdoch; Mr. William J. Nixon; Mr. Richard Quain, M.D., F.R.S.; Mr. T. Gilbert Smith, M.D.; Mr. Joseph White, F.R.C.S.

It is proposed that the evening meetings of the Association shall be held on the third Wednesday in the month. The first, however, will take place on the 26th March, when a paper will be read by Mr. William J. Nixon, House Governor of the London Hospital, on the “Difficulties associated with the Administration of the Out-patient Department, and how best to deal with them.” The meetings will, probably, be held at the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, the chair being taken at 8 p.m. Persons desirous of being present at the Evening Meetings, or of becoming Members or Associates, are requested to communicate with the Secretary, Mr. J. L. Clifford-Smith, at the Office, No. 1, Adam-street, Adelphi, who will gladly forward the necessary forms of application.

EXHIBITION TO ILLUSTRATE THE OPERATIONS AND INFLUENCE OF SCHOOLS OF ART.

We have received from the Committee of the Science and Art Department a circular stating that they consider that it will be of advantage to the art education of the country if an Exhibition of Works of Art Manufacture designed and executed by students of Schools of Art be held during the present year, in connexion with and forming part of the International Exhibition at South Kensington. All articles exhibited must be the work of past or present students of Schools of Art, or executed from designs by such students, the works themselves having been executed since the year 1862. The articles must be certified by the manufacturers, by the Master of the School of Art in which the student has received instruction, or by the student himself. The name of the manufacturer, of the School of Art, and of the student will be published. The decision as to the acceptance of any work for exhibition will rest entirely with the Committee of Selection.

The works must be sent to the Department on or before the 31st of March, addressed to the Secretary.

The following is the classified statement as to the nature of work that will be admitted:—

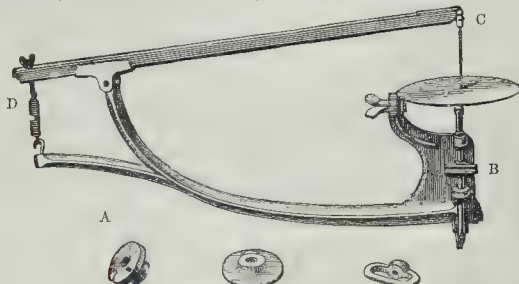
1. School studies in stages of instruction. Designs and models executed by the students in the schools. The latter will be placed with the section to which they belong.
2. Ceramic manufactures, porcelain, earthenware, stoneware, terra cotta, &c.
3. Glass, cut, engraved, flashed, pressed, &c. Stained and painted glass in windows or panels.
4. Enamels on metal. Cloisonné. Champlevé, &c.
5. Ornamental metal-work,—bronze, brass, iron cast or wrought. Drawings and photographs of such works as may have been executed.
6. Silver and gold plate, plated wares, electro deposits, including models for silver and gold work. Drawings and photographs of such works as may have been executed.
7. Jewellery and personal ornaments,—gold, silver, plated, or in any other suitable materials.
8. Furniture and wood carving. Inlaid wood.
9. Pottery. Papier-mâché wares, &c.
6. Decorative carvings in stone or marble.
10. Lace—point, pillow, and machine-made lace. Drawings and photographs of such as may have been executed.
11. Woven damasks in linen and cotton, plain or in colours.

12. Silks, ribbons, trimmings, &c., including furniture and dress fabrics.
13. Mixed woven fabrics for dresses, shawls, scarfs, &c.
14. Printed fabrics.
15. Carpets and tapestry—curtains, table-covers, &c.
16. Painted decorations, wall-papers, &c.
17. Lithographs, chromolithographs, &c.
18. Illuminations. Illuminated addresses. Title-pages of books. Bookbindings, &c.
19. Engravings, engravings on wood, and drawings for engraving.
20. Painted photographs of objects of decorative art.
21. Architectural drawings, designs, and models of buildings.
22. Miscellaneous. Articles not included in any of the above divisions, but yet coming within the object of this Exhibition.

FRET-SAW ARM FOR LATHE.

The engraving illustrates a very useful adjunct to a lathe. The frame is constructed to fit on any ordinary lathe-bed, by means of the usual bolt or ring nut to go under the bed of the lathe.

A driver or catch-plate (A) fits on to the nose of the lathe-mandril with a pin or roller, which works in the cam B, which is fixed to the saw-



bar. By working the lathe a rapid vertical motion is given to the saw.

A screw clamp at the upper end of the saw-bar fastens the lower end of the saw. The upper end of the saw is attached by a clamp to a pivot piece fixed on the arm C. The arm is of wood, and takes in work 16½ in.

The table is made to tilt for cutting at any angle, or for inlay work.

THE CATHEDRAL (R.C.) OF WESTMINSTER.

We extract the following from the *Tablet* of the 1st of March:—

"Some time ago we explained in considerable detail how the site for the new Metropolitan cathedral was to be acquired: first, by the Westminster Land Company (Limited), from the Middlesex magistrates, to whom it had been recovered by the Crown, and then, mainly through exchange of land, by the Cardinal Archbishop from the Westminster Land Company. All these transfers have now been formally completed. Last week the prison and its site were legally conveyed by the Middlesex magistrates to the Westminster Land Company, and the same day the exchange of land between the Cardinal Archbishop and the company was effected. The see of Westminster is, therefore, now in full legal possession of the site of its future cathedral. The first thing to be done now is, of course, to clear away the prison buildings; the sale by auction of the materials is to begin on the 10th of March, and the buildings, according to contract, will have to be pulled down and removed in five months. We understand that the definitive plans for the cathedral will shortly arrive from Vienna, and that the principal modifications of the late Baron Ferstel's original designs are that the church will be lengthened, so as to give more room for a canons' choir, and that it will be raised in height by the introduction of a triforium below the clearstory. The dimensions are, as we mentioned before, 550 ft. in length from Ashley-place to Francis-street, and 300 ft. in width from Morpeth-terrace to the eastern limit of the cathedral ground. The Middlesex magistrates, who have, through their clerk, acted with the utmost loyalty and good feeling

throughout the whole transaction, have, it seems, a 'sentiment' for a particular small gateway on the Ashley-place side of the enclosure, a gateway which is surmounted by a glass case containing the keys of the old prison. This gateway and its appurtenances have, accordingly, been presented to the magistrates as a souvenir by the Westminster Land Company."

WESTMINSTER ABBEY:

THE PROPOSED NEW "SOUTH TRANSEPT."

SIR,—As Mr. James Fergusson has, in your last issue [p.320], given me a friendly challenge, I must ask your permission to reply, and must crave your indulgence if my reply be somewhat at length. The importance of the subject is a sufficient excuse.

Mr. Fergusson very frankly admits that he does not speak from personal knowledge of some of the remains he would destroy, but is satisfied to trust the Ordnance Survey. At what date the survey was made, or what were the qualifications of the surveyors in the way of architectural archaeology, he does not say; but it is innocently presumed that every one must accept such evidence as conclusive.

The careful student, as I hope to show, would

not do well to base his information on this survey only, excellent as it may be. One would have supposed that the plan in Sir Gilbert Scott's "Gleanings from Westminster Abbey," or that of later date, and in fuller detail accompanying Mr. J. T. Micklethwaite's paper, on the Abbey Buildings, and published in the *Journal of the Archaeological Institute*, 1876, would have been better worth consulting. The buildings themselves might also have proved worthy of an examination.

As Mr. Fergusson takes exception to several points in my letter, in detail, and rather flatly contradicts me, I must also go into detail.

And first, with regard to the Infirmary Hall, which now forms the entrance to one of the Minor Canon's houses. Here my opponent is quite wrong. His ideas, based on the infallible Ordnance Survey, are exactly opposite to the facts.

It is the northern end of the hall which is not quite intact. From the little cloister it can be seen, without entering the house, that the gable is modern. The lower part of this wall is, however, old, as is all the rest of the hall.*

Mr. Fergusson is next "puzzled" by my "detailed plan and description of St. Catherine's Chapel." Why did he not look for himself? How long since was it that he gave his so hurried a peep on the ill-kept garden?

As a matter of fact, of this chapel, of which "nothing is now visible on the site above the ground level," the three eastern arches of the south arcade remain entire up to the wall plate. The column next the west wall stands complete, minus its arches; the bases of the columns on the north side are all *in situ* (the western base is not visible, being under the floor of a room); the lower part of the altar is *in situ*, and parts of the walls. A dwelling-house is built on the foundation of the north wall. Mr. Fergusson does not propose to interfere with the "alrpe." His plan, however, shows the ancient eastern wall removed to make way for the west wall of his transept. This sort of noninterference speaks for itself. In his plan, the houses on the north side of the little cloister were not shown; the presumption, therefore, was just. They were to be destroyed.

* I was in error in my letter of February 16th [see p. 284, ante], in saying that this hall was quite complete. I had forgotten the alteration, made by Sir G. G. Scott, to the north gable.

He tells us that he "is not aware of any historical or other local interest that attaches to the infirmary buildings of the Abbey." Is there no interest in the place in which the consecration of St. Hugh of Lincoln in 1186 took place; in which many provincial councils were held, and in which happened the famous contests for precedence between the Archbishops of York and Canterbury; and in which the great Charter of England was finally confirmed in 1225. Does Mr. Fergusson expect to find these facts noted on the Ordnance Survey?

Again, his statement with regard to the two new houses in the College-garden is wrong in every respect. By the fact that Westminster School became possessed of Ashburnham House and the house adjoining it on the east, two of the canons were, simply, left houseless. The construction of two new houses was no matter of choice.

I need not say more to show that my objections are not so very "irrelevant," and that in matters of fact Mr. Fergusson is wrong in nearly every particular.

With your permission, however, I would venture a few criticisms upon the "new south transept" itself, as explained by Mr. Fergusson's plan and letters. The building would be, we are told, very much lower than the Abbey, viz., about 100 ft. to the ridge of the roof. A walk through and around the precincts of the Abbey will, it may be supposed, convince most lovers of the place that a great roof ridge, 180 ft. long, and at the level of the clearstory parapet, would utterly ruin the group, the chief beauty of which lies in the contrast between the lowly clustering of the domestic buildings and the lofty church towering above them.

Then the extreme largeness of parts, as shown in the plan, of the suggested transept, is directly at variance with the general setting-out of the Abbey, where the only excessive dimension is height. The new structure would give a wider nave, wider aisles, and generally a fowness of parts, which, especially in internal effect, would be poor, and in extreme opposition to the general feeling of the building to which it should be a subordinate adjunct. The nave of the Abbey is in width but a little over 40 ft. from centre to centre of the columns. The aisles are from the centre of the columns to the wall face some 15 ft. or 16 ft.

The "new south transept" would be more than 50 ft. from centre to centre across the central part, and its aisles are shown as each about 25 ft. wide. We should thus pass from the lofty and rather narrow Abbey into a place having in excess the broad, empty, and somewhat straddling aspect of the nave of Lincoln. Although the new work would unquestionably be very inferior, it could not fail to have a detrimental effect on the Abbey.

I venture to think, however, that Mr. Fergusson's idea of the timber roof is not the least objectionable part of his scheme. He tells us that he had in his mind the beautiful roof which once adorned St. Stephen's Chapel, hard by. He recommended a "restoration" of it. But what was it? The difference of opinion in this matter is well expressed in Brayley & Britton's book on the "Ancient Palace at Westminster." "Of the form, position, and ornaments of the original inner roof, or vaulted ceiling, there is much difference of opinion amongst architectural antiquaries; some contend that it was of stone adorned with tracery; whilst others assert that it was formed of timber arranged in many panels, and enriched with colour painting and gilding. One or two architects insist that it had a clearstory above the present finishing cornice, and that consequently it must have been very lofty."

It must not be forgotten that this was written shortly after the fire, by men well versed in the study of our ancient buildings, and when the evidences, whatever they were,—remained.

Mackenzie's engravings show a most elaborate wooden roof and a clearstory. Be this as it may, how would this roof, suited to an aisleless building of about 33 ft. span, be "restored," and yet fitted to an aisleless building of some 50 ft. span?

It is but fair to the Mediaeval architect to suppose that he designed his roof to suit the building it was to cover. A mere imitation of this roof, whatever it may have been, to a different scale, and on a building of a totally

* "The History of the Ancient Palace at Westminster," by E. W. Brayley and J. Britton, 1836, p. 452.
† Mackenzie, J., "The Architectural Antiquities of the Collegiate Chapel of St. Stephen, Westminster." 1864.

different character, would, in fact, be simply ridiculous.

As a matter of carpentry, the framing of trusses to span 33 ft. should not be the same as those to span 50 ft.

I have not exhausted the subject, but must not trespass more on your space.

SOMERS CLARKE.

No. 15, Dean's-yard, March 3.

SIR,—Mr. Fergusson's letter in your last week's issue deals with Mr. Somers Clarke's objection to his proposed transept in a rather astonishing manner, stating, on the authority of the Ordnance map, that St. Catharine's Chapel has no existence beyond obscure traces intelligible only to the archaeologist. How Mr. Fergusson can have failed to see the very obvious remains of the chapel, even on the most cursory inspection, I cannot imagine.

Not only is the plan of the whole quite clear, but portions of the walls all round stand above ground, and the south arcade is almost complete, as well as two of the south aisle windows. I am quite satisfied that Mr. Fergusson would be the last to wish to see such interesting remains as these destroyed.

But there is surely an artistic as well as an antiquarian objection to his proposed transept. He claims for it that it would appear an actual part of the Abbey, continuing its south transept 250 ft. further than its builders intended. What could be more destructive of the beauty and symmetry of the Abbey than such an addition to its perfect design? Imagine a transept 250 ft. long, 20 ft. wider than the Abbey nave, and "very much lower"! It could only be a huge ill-proportioned mass,—a "monstrum horrendum, informe, ingens." Its position, too, would be such as to prevent any good view of the Chapter-house.

On the other hand, the design prepared by Sir Gilbert Scott does not pretend to be any actual part of the Abbey, though it would stand in the closest connexion with it, and be in harmony with the design of the Chapter-house and other parts. Mr. Clarke speaks of this plan also destroying some of the old buildings, but this is a mistake. It is carefully kept clear of the Abbey precincts, touching nothing except the southern part of the boundary wall.

J. OLDRIE SCOTT.

SIR,—Having noticed diverse opinions expressed in the correspondence relating to the proposed "Campo Santo" at Westminster Abbey, as to the extent of the remains of the ancient Infirmary Chapel of St. Catharine, I venture to supply a few facts thereon. As a forerunner of works to all the restorations at Westminster Abbey for the past seventeen years, I became intimately acquainted with numerous interesting discoveries made during that time, including the bringing to light of the entire plan of the above chapel. Previously to 1871 the west entrance, south aisle columns and arches, and portions of the south wall, were the only visible remains of the chapel; but in that year the old receiver's house was cleared away, and in digging the foundations for the new house and office we came upon the outside of the north wall of the chapel; and in carefully uncovering and pursuing the remains we discovered the whole of the north aisle, detached bases, and portions of columns *in situ*, and corresponding exactly with the intact ones on the south side, thus giving the total length and breadth of the nave and aisles.

We also found the raised altar space, and here and there the beds of the ancient floor, but no tiles. The whole area of the nave and north aisle, which for a great number of years had been covered with rubbish, would several feet deep, and used as a garden, was then cleared off, and down to the ancient floor line. All the remains are to be seen externally, except a base or two covered by the flooring of the new office. These are accessible through a trap-door.

JAMES HILLMAN.

DERBY ASYLUM COMPETITION.

SIR,—The conditions of the above have been issued to, I believe, about 150 applicants. In them there is no mention of either a preliminary competition or of a professional arbitrator on the plans, but of which the advocates by the new rules agreed on by a committee on the subject, and endorsed by the Royal Institute of British Architects.

There is plenty of time for all intending competitors to urge the Town Council of Derby to adopt the principle, and appoint an arbitrator, and I should be glad, through the medium of your paper, to ask your readers to write individually to the Town Clerk at Derby, or to sign petitions, which I have no doubt each editor of the professional papers would allow to lie in his office for a week, and would then undertake to forward to the Town Clerk at Derby.

R. STARK WILKINSON.

MECHANICAL AIDS TO SCULPTURE.

SIR,—Permit me through the medium of your paper to thank Lieut.-Col. Crozier [see p. 320, ante] for introducing me to a machine with which I confess I was not acquainted. I think, however, that Col. Crozier somewhat mistakes the point at issue. I do not deny that many machines have been made, all more or less on the same principle, which have been successful in the reproduction of copies, on a very small scale, from an original model; neither do I claim to be the original inventor of novel mechanical movements or mathematical principles. These latter must remain the same in all instruments of this class. It is, however, a fact that none of these machines have ever produced satisfactory work on a large scale. I have already mentioned the two chief causes of error. I do not think that a self-acting carving-machine would be of advantage either to art or to artists, even were such a machine possible. We desire that our labour should be lightened for us, as far as the mechanical part of it is concerned; but he would be a feeble artist, indeed, whose work could be done for him by any machine whatever. My instrument is a proportional pointing instrument, and not a copying-machine, and performs work which, as far as I know, has not been successfully attempted by any other instrument. In conclusion, I can only say that if Col. Crozier cares to see it I shall be most happy to show it to him.

GEORGE SIMONDS.

152, Buckingham Palace-road,
March 4.

LEASEHOLD ENFRANCHISEMENT BILL.

SIR,—The proposal that every tenant of urban property should be enabled to acquire the fee simple by compulsive purchase would in one way act very injuriously,—I mean by depriving residents of the security they at present enjoy (by virtue of the usual covenants in leases of private houses) against the carrying on, by any of their neighbours, of any such trade or business as might spoil the residential character of the locality, and thereby, of course, diminish the value of the houses therein.

It seems to me that all that is wanted is an Act providing that "In every case where a lease is granted in consideration of the expenditure by the tenant of any sum in buildings or other improvements on the premises, the tenant shall be entitled to require a renewal of his lease for such a term as would, with the term originally granted, make up a term of such length that, for every year's rent expended on the premises by the tenant he should have three years' enjoyment of the premises." Thus if the ground-rent were 5*l.* and the amount to be expended 500*l.*, the tenant would be entitled to a lease for $\frac{500}{5} \times 3 = 300$ years. This would involve

no expensive arbitration or investigation of title, and would, I think, answer every useful end.

W. A. L.

THE VENTILATION OF THEATRES.

SIR,—I was present at the Parkes Museum on the 12th of February, and heard Mr. Seddon's paper on the above subject. [See pp. 225, 282, ante.] I entirely agree with all that he said, but it struck me as being somewhat strange that a system of ventilation that has been before the world for more than thirty years should now require to be advocated as if it were quite new.

Has there been neglect or ignorance in persons usually consulted upon ventilating schemes, or a desire for half-measures on the part of those requiring them, or neglect on the part of the public in failing to demand improvement? I was glad to hear that Mr. Seddon went in for a thoroughly comprehensive system for every part of the theatre.

Unfortunately for the cause of efficient ventilation, our plays and actors have for the last few years been so good that the public has been almost forced to the theatres, even to the damage of its own health; one is almost tempted to wish that they were left without profitable audiences until some important affliction attacked them.

That Mr. Seddon's system would secure this I have no doubt, and the expense, particularly in a new house, would not be such as to prevent any judicious manager adopting it.

The attempt to ventilate a theatre by an upcast shaft from the roof, while the motion of the air is prompted by fans or exhaust-pump ventilators, or by sun-lights without any proper openings for the admission of fresh air, must fail; and if proper inlets for pure air are provided, the failure in point of comfort to the audience will be more apparent; for if you rely upon the draught of the upcast shaft to secure a passage of air through the building, the pure air will be violently pulled through some of the openings, and other parts of the house will be left without any supply at all; consequently those persons sitting near the active openings would condemn the whole system, as also would the others; for,

though feeling no draught, they would suffer as much from the want of pure air as now.

If Mr. Seddon's scheme (which is really a revival of the late Dr. Reid's principle) were fairly carried out, a pressure would be put upon all the air in the mixing-chambers and delivery-ducts, which air, after having been filtered, washed, cooled, or heated, would be driven into the house through appointed openings, each of which must take the quantity intended. I would suggest that a difference be made in the points of supply of heated and cooled air; the former should be delivered somewhere in the risers of the seat spaces; the latter should enter above the heads of the audience, and I would in some cases provide for a wall or curtain of pure air to rise as a division between some parts of the house.

There would be one more advantage in Mr. Seddon's system which he did not mention. It is this. If pure air is forced into the house, not drawn, it would be easy, upon the fall of the curtain, to close the spent-air exits. Then, upon opening the doors, the air of the house would flow into and fill all the corridors and staircases with a stream of pure and tempered air, and the departing visitor would, as it were, be wafted upon a congenial breeze, feeling no change of temperature until actually outside the theatre. At present all, and especially ladies thinly clad, have to face a strong blast of cold air rushing from the street into the heated house: this causes many colds, much personal suffering, and also considerable loss to the treasures of the theatres.

HENRY H. HAZARD.

PIPES v. FAÇADES.

SIR,—Many will sympathise with the remarks by "Beaude" on p. 255, and if it is to be understood that ventilating blow-off pipes for sewers or drains are to be fixed up outside buildings, it is but right that architects should make provision that they be as little of an eyesore as possible. This, however, must principally apply to new structures. In regard to buildings already erected it is often no easy matter to put up the ventilating blow-off pipes without being an eyesore, and only this week an architect and myself were considering how best to do so upon a very fine building.

In regard to putting up blow-off ventilating pipes for the sewer or drain at the front of a house facing the street, this pipe may have to go up either on the outside or inside of the front wall. If the pipe is to be used for ventilating the drain beyond the disconnection-trap and also the sewer I have been hitherto opposed to it being placed *inside*. In that case some decidedly object to it being placed outside on account of the disfigurement of the frontage, so that the question is forced upon plumbers and sanitary engineers how to put up a ventilating-pipe for the sewer inside the front wall with complete safety to the occupants or users of the building.

I think this might be done by using a strong cast-iron pipe, $\frac{3}{4}$ in. or so thick, painted with red lead both inside and outside, and the joints run with lead; or malleable iron pipes might be used, $\frac{3}{4}$ in. thick, also painted inside with red lead, but with screwed joints. Instead of being bolted to the wall, these pipes might be supported by strong malleable iron spikes with half-circle band attached, and then loose half-circle band screwed on to fix the pipe. A few feet out from the wall a large stopcock might be put on underground, and inside of it an access opening made to enable the pipe inside of the building to be easily tested for leakage, and also, if desired, a disease-germ filter might be put on near the access opening to keep out disease germs from passing up the ventilating-pipe inside of the building, while yet allowing free passage to the air. This notion or plan is my latest contribution to sanitary practice in the drainage line. The material to be used in these sewage-air filters may be asbestos, cotton, or other suitable fibrous material. The Commissioners of Patents, under the new Patent Law, have granted provisional protection for the plan, but there has not been sufficient time yet for proper practical experiments being made; but I may refer to such at a future time.

W. P. BUCHAN.

P.S. It must be understood that there are no branch connexions into this pipe inside of the building.

RE ARBITRATIONS.

SIR,—In the report of a case in the Court of Appeal, *Fraser v. Ebrusund*, reported in the March number of the *Law Journal*, confirming the case of *Meier v. Rouse*, it appears to be now clear that without the words "this submission to be made a rule of court" in the agreement to refer, either party may retire from the agreement at any moment up to the making of the award. In other words, each party agrees to refer the dispute to arbitration so long as he and his opponent remain of the same mind; an arrangement which is very far from being business-like. It would appear from this that the arbitration clauses in building contracts as at present drawn are capable of being made abortive at the instance of either party.

As this is a matter of great importance, it occurred to me that it is not possible to give too great publicity to the decision.

HERBERT D. APPLETON, A.R.I.B.A.

157, Wool Exchange, E.C.

BELGIAN GRANITE.

SIR,—I should be obliged if any of your correspondents could inform me of what stone the new Palais de Justice at Brussels is built of. I have heard it described as 'Belgian granite,' but it has much the appearance of being an artificial stone. If the latter is the case, how is it made?

WILLIAM STAGG.

[Canon's Marsh, Bristol.]

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Feb. 22.—3,737, C. Cooper and W. Cooper, Great Crosby, Manufacture of Bricks.—3,741, J. Parker, Birmingham, Door-locks.—3,754, H. Conolly, London, Water-closets.—3,755, H. Conolly, London, Water-waste Preventer.—3,756, W. Johnson, Plumstead, Venetian Blinds.—3,763, C. Allen and W. Allen, Holmes Chapel, Horticultural Buildings.

Feb. 23.—3,814, W. H. Tylor, London, Drain-traps.—3,846, W. J. Mason and G. Swann, London, Heating Apparatus.

Feb. 25.—3,873, J. Powell, Belfast, Concrete.—3,878, J. Smeaton, London, Water-closets.—3,908, J. Leedham, Sheffield, Ashpan for Fireplaces.

Feb. 26.—3,913, W. Devott, Erdington, Flushing Water-closets, Drains, &c.—3,923, A. A. Carter, Rotherham, Stoves.—3,945, E. Robinson, Dukinfield, Ventilating Rooms.—3,971, E. Pearson, London, Water-closets.—3,972, G. A. Harvey, Lewisham, Chimney-pots and Ventilators.

Feb. 27.—3,988, T. Whitehead, Liverpool, Chimney-tops, &c.—3,998, C. J. Henderson, Edinburgh, Stoves and Ventilating Apparatus.—4,001, E. S. Norcombe, Birmingham, Rack Pulleys for Window Blinds.—4,008, J. M. Shaw, Glasgow, Fire-grates.—4,021, F. J. Nibbs, London, Forms of Roofing Tiles.—4,031, T. Waller, London, Urinals.—4,037, G. Holmes, Derby, Window-sashes.—4,040, J. Gilmore and W. R. Clark, London, Ventilating Apparatus.—4,045, C. Lawrence, Southampton, Cooking-ranges.—4,047, C. Lawrence and J. Searle, Southampton, Ventilators.

Feb. 28.—4,051, W. Thompson, Stratford-on-Avon, Concrete Construction.—4,063, J. Phillips, London, Gully-tank Trap and Drain.—4,076, W. Dawes, Leeds, Water-closets.—4,094, A. Sweet, London, Ventilators.—4,110, B. Giles, London, Gully-traps.

SPECIFICATIONS ACCEPTED.†

Feb. 26.—955, J. D. Wright, London, Chimney-top and Ventilator.

Feb. 29.—671, A. Putney, London, Wood Floorings.—559, P. Matthews, Slough, Glazing.—1,630, T. Sanders, Birmingham, and T. Stubbs, London, Window-fasteners.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending March 1, 1884.

3,151, W. Corliss, Providence, U.S.A., Fireproof Buildings, &c. (June 26, '83, price 6d.).

The walls, doors, &c., are made in any manner; but to produce tight joints round the doors when shut, locking-plates, which are mounted in the doors, are moved so as to extend across the joints and enter recesses in the casings. They are actuated by the handle, like the usual locking-bolts are.

3,157, T. H. Rees, London, Manufacture of Tile Slabs, &c. for Walls, Floors, and Hearths. (June 26, '83, 4d.).

Pieces of glass are ornamented as required, and on the backs thereof are fixed thin pieces of slate, stone, or wood, which are then covered by cement. These tiles, &c., are fixed to the walls by copper tags or tongues.

3,296, E. M. Lee, London, Window-fastenings, &c., by W. C. Lee, Paris (July 3, '83, 6d.).

In a vertical plate on the lower rail of the upper sash is an oval hole, and on the upper rail of the lower sash is mounted a spring bolt, which has an oval head. When this is passed through the hole the bolt is turned, and thereby locked.

3,366, A. Tylor, London, Apparatus for preventing Waste of Water (July 4, '83, 2d.).

The short leg of the syphon opens into a chamber in the cistern, and a flap in this chamber forces a sufficient quantity of water up the short leg to fill the bend and start the syphonic action. (Pro. Pro.)

3,315, W. Wade, Crowe, Fire-grates, Kitchen Ranges, &c. (July 5, '83, 2d.).

The fireplace has a bottom capable of being moved up and down in an enclosed space below. When the bottom is filled with coal, and the fire is lighted at the top, the bottom is raised as the coal is burned. (Pro. Pro.)

3,396, D. Timings and S. Timings, Birmingham, Construction of Door-springs (July 9, '83, 6d.).

On the spindle round which the spring is wound is a toothed wheel, and a hole is made through the top of the casing. The spring can be wound up to any required tension, and secured by passing a pin through the hole to engage one of the teeth of the wheel.

3,467, H. J. Hadden, London, Grates. Com. by E. Breslau, Berlin. (July 13, '83, 4d.).

The grate has a number of disc-shaped or polygonal sections mounted on shafts, and made of metal or earthenware, by which a greater supply of air is admitted.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

MEETINGS.

SATURDAY, MARCH 8.

Architectural Association.—Visit to the Brompton Oratory. 3 p.m.

Artisans' Technical Association (1, Adam-street, Adelphi).—Mr. C. T. Mills on "Trades' Technical Education." 8 p.m.

Royal Institution.—Captain Abney, R.E., F.R.S., on "Photographic Action Considered as the Work of Radiation" (II.). 3 p.m.

MONDAY, MARCH 10.

Royal Academy.—Mr. E. J. Poynter, R.A., on "Sculpture." 8 p.m.

Surveyors' Institution.—Mr. A. J. Burrows on "The Construction and Maintenance of Country Roads." 8 p.m.
London and Middlesex Archaeological Society.—(1) Mr. Henry Poole on "The Four Northern Chapels of the Ape of Westminster Abbey;" (2) Mr. Thomas Milbourn on "London Clubs;" (3) Mr. John E. Price "On the Recovered Monumental Brass of Sir John Popham." 8 p.m.
London Institution.—Mr. Frederic Harrison on "London as a Historical City." 5 p.m.

Society of Arts.—Professor W. Chandler Roberts, F.R.S., on "The Alloys used for Coinage." (Cantor lecture.) 8 p.m.

TUESDAY, MARCH 11.

Institution of Civil Engineers.—8 p.m.

WEDNESDAY, MARCH 13.

Architects' Benevolent Society (9, Conduit-street, W.).—Annual General Meeting. 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. A. J. Gale on "American Construction." 7 p.m.

Society of Arts.—Lieut.-Gen. F. H. Russell, R.E., on "Water Regulation in regard to Floods, Drainage, and Transit." 8 p.m.

THURSDAY, MARCH 13.

Society of Antiquaries.—Mr. H. J. Napper on "The Sites of Clausentum and Venta Belgarum and other Stations mentioned in the Itinerary of Antoninus." 8.30 p.m.

Society of Engineers.—Mr. J. W. Wilson, jun., on "Roof Construction." 7.30 p.m.

Royal Academy.—Mr. J. E. Hodgson, R.A., on "The Library of the Royal Academy." 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. W. H. Cope on "Jade,—its Peculiarities and Mode of Treatment, Artistic and Mechanical." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Dr. F. E. Froehland on "The Upper Thames as a Source of Water Supply." 8 p.m.

Society of Telegraph Engineers and Electricians.—Mr. W. H. Massey on "A Train-lighting Experiment." 8 p.m.

Park Museum.—Dr. Henry Veale on "Organisation and Management of Field Hospitals." 5 p.m.

Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigations." (III.) 3 p.m.

London Institution.—Prof. E. Pauet on "Romanticism in Music." 7 p.m.

FRIDAY, MARCH 14.

Architectural Association.—Mr. Hampden W. Pratt on "Shams." 7.30 p.m.

Miscellaneous.

General Engineering Construction.

The third of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, vice-president of the Crystal Palace School of Practical Engineering, was delivered on the evening of February 28, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Chas. Gandon, vice-president, in the chair. The lecturer, after pointing out, by way of introduction, the importance of actual experience in such matters as the subject of the lecture, proceeded to give some useful practical hints upon patternmakers' tools and their use in the preparation of patterns. Touching upon the designing of castings, he passed on to the consideration of different kinds of patterns, cores, core-boxes, &c., and then explained, by means of diagrams and models, the general arrangement of foundries, the nature and operation of cupolas, foundry-ladles, cranes, travellers, &c. Proceeding with the subject of moulding in different materials, he explained the chief defects incidental to castings, and passing on to the different kinds of moulds for open and closed work, he concluded by considering the nature of arrangements for large castings, with special reference to the large pipe works at Messrs. Cochrane's Woodside Ironworks. He also described their process of testing.

Royal Hibernian Academy, Dublin.

On Monday last the Royal Hibernian Academy's Exhibition was opened for the season by the Lord Lieutenant and the Countess Spencer. The Viceroyal party were received by the President of the Academy (Sir Thomas A. Jones), Messrs. Henry E. Doyle, C.B.; Thomas Drew, James Brenan, P. Vincent Duffy, Thomas Farrell, James Farrell, Charles Grey, Arthur J. Mayne, James H. Owen, Catterson Smith, B. Colles Watkins, Academicians; and W. J. Fitzpatrick, John T. Gilbert, and Walter F. Osborne, hon. members.

Architects' Benevolent Society.

The annual general meeting of the subscribers and donors will be held at the rooms of the Institute on Wednesday next, at five o'clock.

The Royal Commission on the Housing of the Poor.

It is announced in Tuesday's *London Gazette* that the Queen has been pleased to issue a Commission, under her Majesty's Royal Sign Manual, "to inquire into the housing of the working classes." Sir Charles Dilke is nominated as Chairman, and the following are appointed Royal Commissioners:—The Prince of Wales, Cardinal Manning, the Marquis of Salisbury, Earl Brownlow, Lord Carrington, Mr. George Joachim Goschen, M.P., Sir Richard Assheton Cross, M.P., the Bishop-Suffragan of Bedford, Mr. Edward Lyulph Stanley, Mr. W. T. M'Cullagh Torrens, M.P., Mr. Henry Broadhurst, M.P., Mr. Jesse Collings, M.P., Mr. George Godwin, and Mr. Samuel Morley, M.P. The Commissioners are authorised to call before them, or any five or more of them, all such persons as they may judge most competent, by reason of their situation, knowledge, or experience, to afford correct information on the subject, and also to call for, have access to, and examine all such books, documents, registers, and records as may afford them the fullest information on the subject. They are empowered to visit and personally inspect such places in the United Kingdom as they may deem expedient, and they are directed with as little delay as possible to report upon the matter submitted for their consideration. Mr. John Edward Courtenay Bodley, Barrister-at-Law, Master of Arts, is appointed Secretary to the Commission.

Sewage and Plumbing Work.

What the *Glasgow Herald* describes as "a small proportion" of the members of the Architectural Section of the Glasgow Philosophical Society met on Monday evening, in the rooms in Bath-street, to hear papers on "Sewage" and "Sanitary Plumber Work," by Messrs. David Thomson and A. Lindsay Miller respectively. Mr. Thomson's chief point in treating the subject of "Sewage" was the separation of the excremental matter of the sewage from the rainfall and waste water from dwelling-houses and manufactories that at present were together discharged into the river. He advocated the formation of intercepting sewers for the reception of the house sewage, which could then be cleaned by precipitation and filtration, the sludge used for manure, and the water carried into the river. By some such plan the Clyde might, he believed, be changed from its present filthy state. Mr. Miller, in his paper on "Sanitary Plumber Work," noted the improvements that had been recently introduced, and expressed the conviction that these were but steps towards greater perfection. He confined his remarks to that section of plumber work connected with water-closets, baths, &c., leaving out of consideration the matter of water supply.

The Longfellow Memorial.

On Saturday last the bust of Longfellow, by Mr. Brock, A.R.A., was unveiled in Westminster Abbey, in the presence of a considerable number of persons interested in the matter, including the daughters and niece of the poet, Earl Granville, Mr. Russell Lowell and other members of the American Legation, Mr. Childers, Sir Theodore Martin, Mr. George Godwin, Mr. Karl Blind, Mr. Hyde Clarke, and others. The sub-Dean, Canon Prothero, in the unavoidable absence of the Dean owing to a family bereavement, unveiled the bust; and speeches were made by Earl Granville, Mr. Russell Lowell, Mr. Childers, and Dr. W. C. Bennett, the hon. secretary for the memorial fund. The bust, however, having been unveiled, has been, up to the moment of writing this, in a veiled state again, and the pedestal taken down apparently for some more permanent fixing. To announce a monument as "unveiled" and then cover it up again during just the few days when every one is interested in it and going to look at it, is, to say the least, bad management.

Wrought Iron Gates.

Messrs. Barnard, Bishop, & Barnards have erected some cast-iron gates of rather exceptional size at the entrance to the Great Eastern Railway depot, facing High-street, Bishopsgate. The gate to the entrance to the incline is 25 ft. wide by 16 ft. high in one leaf. It hangs on a cast-iron pier, and special machinery has been constructed for opening and shutting it. The design of the gates is by Mr. A. Barnard, of the firm, and is superior to the average of what may be called commercial work of this kind.

The Sportsman's Exhibition.

The third annual Sportsman's Exhibition is now open at the Agricultural Hall, Islington, and will remain open until the 15th inst.

Zinc in Drinking-Water.—It seems that there is some danger attendant upon the use of galvanised iron water-pipes. Mr. J. Raglan Thomas, the medical officer of health for Llanelli, recently detected zinc in the water supplied through about half a mile of galvanised iron pipe to the village of Cwmfelin. Samples of the water, before and after its passage through the pipe, were sent to Mr. Heaton, of Charing-cross Hospital, who has published the results in the *Chemical News*. The water as it leaves the spring at Penderly is remarkably pure, containing in one gallon 10.8 grains total solids, 1.47 chlorine, .056 nitrogen as nitrates, and no ammonia. After leaving the pipe the total solids had risen to 18.9, of which 6.41 consisted of zinc carbonate. The chlorine was unchanged, but the nitrates had disappeared, and were replaced by .008 of ammonia, obviously formed by the reducing action of the zinc-iron couple. The zinc was found to be present as carbonate dissolved in free carbonic acid. It was found by independent experiment, that pure zinc is rapidly dissolved when placed in water through which a current of oxygen and carbonic acid gas is passed. The solution of ferrous carbonate by carbonic acid is well known. Many chalybeate springs contain iron in this condition. When such water is exposed to the air the iron is deposited as ferric oxide, which forms the well-known rusty incrustation round the spring. Zinc dissolved in this way could, of course, be separated from the water by boiling or by precipitation with lime or sodic carbonate, but these processes could hardly be applied to a town supply.—*The Lancet*.

The Inhabited House Duty.—In the House of Commons, on the 29th ult., on the order for Committee of Supply, Mr. Alderman Lawrence moved his annual resolution, "That in order to afford facilities for adapting buildings, and parts of buildings, for the occupation of the labouring poor, and in order to offer inducements for the erection of houses and blocks of buildings especially suitable for artisans and labourers, it was absolutely essential the restrictions as to size and mode of construction at present entailed by the Inhabited House Duty Acts should be removed and the tax repealed." In making this proposal, the hon. member described the impost as being unequal and unjustly assessed, and as a tax upon health, morality, and decency. The Chancellor of the Exchequer, who opposed the motion, admitted that, as in the case of every other tax, there were grave objections to this duty, but it produced £1,800,000 a year, and in itself was not a bad tax. If, however, on some future occasion circumstances were more favourable, it might perhaps be put on a better footing. Eventually Mr. Lawrence intimated his willingness to withdraw the motion; but, this being objected to, it was put and negatived.

The Government of London.—At a special meeting of the council of the London Municipal Reform League, held at Lancaster House on Thursday [the 28th ult.] it was resolved that,—"This meeting regards with anxiety the delay in introducing the long-promised London Government Bill, and requests her Majesty's Ministers to name a day for its introduction before Easter, and that the honorary secretary be instructed to convene an early conference of delegates to consider the propriety of calling a mass meeting to protest against any further delay."—*The Metropolitan*.

Pepys Memorial.—The result of the labours of the committee formed to consider the best means of obtaining a satisfactory memorial of Samuel Pepys, the diarist, is an appropriate monument, designed by Mr. A. Blomfield, which has been erected in the church of St. Olave, Hart-street, E.C., where Pepys is buried. The monument will be unveiled by the Right Hon. the Earl of Northbrook, K.C.S.I., First Lord of the Admiralty, on Friday, the 14th inst., at 3 p.m., and his lordship will be assisted on the occasion by His Excellency the United States Minister. We understand that the committee still require some more subscriptions.

The Zeughaus at Dresden.—The Saxon Government brought forward last November a proposal for the rebuilding of the Zeughaus at Dresden, and its adaptation to the purposes of a State Archives Office and a Museum. The arrangements for keeping State papers have long been found insufficient, and various collections of plaster casts, steel engravings, drawings, &c., have accumulated in such a manner as to necessitate increased accommodation being provided for them. The total cost is estimated at about £2,000.

Proposed Organ Manufactory, Kendal. Messrs. Wilkinson & Sons, of this town, propose building immediately large organ manufactory, pianoforte saloons, offices, &c., and residence. The available floor-space for business purposes will be over 9,000 superficial feet, and when complete the building will be one of the largest of its class in the North of England. The design will be Gothic freely treated; freestone dressings will be used to the front elevations, and the works will be entered by a handsome porch with deeply-moulded arch and granite columns. The entire frontage of the whole block will be 170 ft., which will face the river Kent. The plans have been arranged and the designs made by Mr. Eli Cox, architect, of Kendal.

Lead versus Pot Pipes.—Under this head a correspondent writes:—"An accident has happened which it is desirable should be made known to others who use lead pipes. A bad smell having been noticed in the closet an examination was made, and it appears that the rats had run up the drain and bitten a hole through the lead pipe, the consequence of which was shocking and dangerous. A pot pipe has now been substituted which will, no doubt, effectually keep out the rats."

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday, the 26th ult., under the presidency of Mr. W. H. Kendrick. Mr. W. Henman was elected an ordinary member. A paper was read on "Flowers, Fruit, and Filigree under Glass," by Mr. B. McEvoy. A discussion ensued, in which Messrs. Scruton, Cotton, McConnel, and Franklin Cross (hon. sec.) took part. At the close a vote of thanks was presented to the reader of the paper.

A Correction.—We have been asked to state that the hot-water apparatus for warming the new Infants' School at Carshalton was fixed by Messrs. J. Jones & Sons, hot water engineers, and not by Mr. Jones, as given in our article upon Carshalton. The same firm were also entrusted with the heating of St. Mary Magdalene Church, Munster-square, N.W., the re-opening of which was announced in our last number.

Carlisle.—New Presbyterian Sunday Schools have been opened here. They have been substantially built by Mr. George Black, the contractor, from the designs of Mr. George D. Oliver, architect, Carlisle.

TENDERS.

For the erection of fifty-seven cottages at Cathay, Cardiff, for the Cardiff Railway Workmen's Cottage Company, Limited. Quantities by the architect, Mr. J. P. Jones, 25, Park-street, Cardiff:—

S. Shepton	£12,050 0 0
C. Shephard	11,819 0 0
W. T. Clarke	11,200 0 0
J. Gough	10,150 0 0
W. Symonds	9,990 0 0
Purnell & Fry	9,519 0 0
D. Davies	9,500 0 0
J. G. Green	9,450 0 0
Rattay & Thomas	9,366 0 0
W. A. Walters	9,245 0 0
E. A. Smith	8,999 0 0
H. Brown	8,908 0 0
Job Thomas & James	8,720 0 0
D. J. Davies (accepted)	8,600 0 0
E. Cox	7,900 0 0

For the formation of roads, sewers, &c., at Canton, Cardiff, for the Glamorgan Workmen's Cottage Company. Messrs. James Seward & Thomas, architects and surveyors, Cardiff:—

T. Thomas	£694 13 0
R. Day	681 0 0
Jepson Bros.	630 0 0
J. C. Pearson	620 19 0
R. Smith	584 12 7
A. Green	573 1 6
T. Rees (accepted)	503 6 0

For the restoration of Birtley Church, North Tyne for the Rev. G. B. Hall, Mr. Arthur P. Plummer, architect and surveyor, 45, Cloth Market, Newcastle-on-Tyne:—

Robson & Tremble, Hetton-le-Hole	£724 0 0
M. Martinson, Corbridge	690 0 0
Milburn & Gibson, Benildside	638 0 0
W. Welton, Mollow Burn, Wark	633 9 0

* Accepted.

Carpenter's Work only.

J. Adamson & Son, Shildon	£256 5 0
G. Graydon & Son, Durham	286 11 6

Mason's Work only.

T. & W. Bell, Bellingham	£294 0 0
W. Welton, Mollow Burn	235 13 0

For the erection of villa residences at Croydon, for Mr. J. S. Dowton. Mr. H. J. White, architect, Wallington, Surrey:—

J. Horrocks	£650 0 0
Smith & Balled	579 0 0
Howe & White, Wallington (accepted)	525 0 0

For King's Bridge, Swallowfield. Messrs. Morris & Stallwood, architects and county surveyors:—

J. Winter, Reading	£236 0 0
F. Talbot, Caversham	228 13 4
T. Godwin, Reading	235 0 0
H. & A. Lewis, Reading	264 0 0
E. Wheeler, Swallowfield	243 19 0
W. H. Simonds, Reading	240 0 0
H. Tate, Shinfield	230 0 0
W. H. Woodroffe, Reading	229 0 0

Ironwork.

Bridge and Roofing Co., Darlington	£254 19 5
Stockton Forge Co.	434 16 9
H. Young & Co., Pimlico	425 0 0
A. Hardy & Co., Derby	402 0 0
J. O. Gardner & Co., London	399 10 0
W. H. Simonds, Reading	385 0 0
Morewood & Co., Birmingham	384 0 0
M. T. Shaw & Co., London	352 5 0
E. Finch & Co., Lim., Chesham	370 0 0
J. Shewell & Co., Darlington	357 0 0
Reading Ironworks	335 0 0
Carter, Ford, & Co., Darlington	324 3 8
S. Griffith, Reading	320 4 9

For additions and alterations to boys' school, for the Ormeau School Board. Mr. John W. Alexander, architect, Middlesbrough:—

J. Johnson, Middlesbrough	£213 15 0
W. & G. Readman, North Ormeau	734 5 7
R. Wilkinson, Middlesbrough	790 3 4
A. King, North Ormeau	725 18 0
J. Dickinson, Saltburn	745 0 0
Sturdy Bros., Middlesbrough	727 10 0
A. White, Gainsborough	681 0 11

* Amended tender (accepted) £235 9 0

For the erection of stabling at Eastbourne for sixty horses, with proportionate harness room and carriage accommodation, &c., for Mr. S. H. Weston. Mr. Oliver Mitchell, architect, Eastbourne. Quantities supplied:—

Cornwall & Son, Eastbourne	£5,050 0 0
J. Hurst, Eastbourne	4,854 0 0
Doro & Sons, Eastbourne	4,477 0 0
J. Peerless, Eastbourne	4,213 0 0
J. Longley, Crawley (accepted)	4,095 0 0
Hudson, Kearley, & Co., Brighton	3,550 0 0

For the construction of new pier approaches, toll-houses, &c., to Southend Pier, Essex. Mr. Arthur Cayton, surveyor, and Mr. Edward Wright, architect. Quantities by Mr. R. E. Carpenter, Stapenhill, Burton-on-Trent:—

No. 1.	No. 2.
Joseph Bullock, Southend	£4,792 0 0
B. Cooke & Co., Phoenix	—
Warr, Church-road, Battersea	4,250 0 0
John J. Robson, Marlborough-road, Snarebrook	4,159 0 0
J. W. Steward, Southend	4,094 11 6
Bottoms, Bros., 27, Bannett-road, Lavender-hill, Battersea	4,064 0 0
Baker & Wiseman, Southend	3,993 13 0
Samuel Chafan, Rotherhithe	3,936 0 0
G. J. Sead & Co., No. 69, Zealand-street, Southport	3,870 0 0
S. Darke & Son, Southend	3,630 0 0
Wm. Wood, Chelmsford	3,560 0 0
J. E. Potter, Southchurch Beach, Southend	2,431 13 2

For the erection of a villa residence at Raynes Park, for Mr. H. B. Mr. A. Stubbs, architect:—

M. R. Priestley	£285 10 0
R. M. Priestley	829 0 0

For building a workshop at 181, Hanbury-street, Mile End New Town, for Mr. S. Locks. Mr. Edward Brown, surveyor, Hanbury-street, Spitalfields:—

C. Marr	£218 0 0
S. Hawkins (accepted)	112 0 0
Impy	96 0 0

For alterations to the College Arms, Old Belnal Green-road, for Mr. A. H. Craddock. Mr. Edward Brown, surveyor:—

S. Salt	£215 0 0
Jackson & Todd	510 0 0
C. Marr	490 0 0
S. Hawkins	466 0 0

For repairs to the Clarence Arms, Plumstead-road, South Woolwich, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. Edward Brown, surveyor:—

J. May	£209 0 0
S. Hawkins	163 0 0
J. Christoffer	159 0 0
G. Read (accepted)	157 15 0

For works to be executed for Mr. L. Spackman, 9 and 10 Temple-lane, and No. 14, Bouvier-street, Fleet-street. Messrs. Perry & Reed, architects. Quantities supplied:—

Clarke & Bracey	£2,283 0 0
Clements	1,785 0 0
Nottle	1,754 0 0
Brandsen	1,728 0 0
Oliver	1,693 0 0

For house at Hendon, for Mr. Elliot. Mr. John Farrer, architect, Albion Chambers, Finsbury-pavement:—

Gibbs & Imber	£2,049 0 0
Oldrey	1,897 0 0
Rhodes	1,805 0 0
Wilkinson Bros.	1,777 0 0
Conder	1,730 0 0
W. Smith	1,719 0 0
Smith & Sons	1,697 0 0
Marriage	1,649 0 0

For additions to shops at Plumstead, for the Woolwich Royal Arsenal Co-operative Society. Mr. J. F. Goodey, architect, Colchester:—

Bowditch & Burley	£3,090 0 0
Arnold & Sons, Plumstead	2,324 0 0
Proctor, Woolwich	2,200 0 0
Hosking, Stratford	2,068 0 0
Oldridge, Colchester	2,019 0 0
Redman, Brockley	1,997 0 0
Dobson, Colchester	1,990 0 0
Dupont, Colchester	1,853 0 0
Combs, Plumstead	1,850 0 0
Award, Maidstone	1,814 0 0
D. & A. Brown, London	1,889 0 0
Pyle & Co., London	1,820 0 0
Loneragan, Plumstead	1,813 0 0
Johnson, Woolwich (accepted)	1,750 0 0
Harris, Woolwich	1,748 0 0
Watson, Dulwich	1,725 0 0
Forstady, Plumstead	1,331 5 6

For the erection of an infirmary at Dover Union. Messrs. Trevor & Cresswell, architects, 53, Castle-street, Dover. Quantities supplied by architects:—

Sergeant & Pettman, Bekebourne	£5,500 0 0
W. Brooks, Folkestone	5,000 0 0
M. A. Welch, Dover	4,350 0 0
J. Bull, Son, & Co., Southampton	4,107 0 0
J. G. Jackson, Dover	4,100 0 0
T. J. Chamberlain, Dover	4,099 0 0
Austen & Lewis, Dover	4,070 0 0
W. J. Adcock, Dover	4,025 0 0
Lewis & Chandler, Dover	4,000 0 0
W. J. Wiles, Dover	3,989 0 0
H. Richardson, Dover	3,949 0 0
G. H. Denne & Son, Deal	3,875 0 0
W. T. Dowle, Dover	3,758 0 0
W. J. Bromley, Dover	3,730 0 0
W. G. Lewis, Dover	3,717 0 0
H. Stiff, Dover (accepted)	3,685 0 0

For proposed class-rooms and improvements to the National Schools of St. Mary-the-Less at Lambeth. Mr. J. Llewellyn Wilson, architect. Quantities by Messrs. Beesley & Williams:—

W. Brass	£1,412 0 0
Colls & Sons	1,385 0 0
Heath	1,290 0 0
W. Parker	1,246 0 0
Mark Manley	1,237 0 0
Alfred Roome	1,224 0 0
G. F. Williams	1,148 0 0

For the erection of a wall to enclose the grounds of Chiswick House. Mr. Henry Curry, 37, Norfolk-street, Strand, W.C., architect.

Nowell & Robson, Kensington	£2,697 0 0
Eydman, Turnham Green	2,610 0 0
Haywood, Eastbourne	2,197 0 0
Arundell & Son, Clivich (accepted)	1,998 0 0

For making main sewer and works connected therewith at Gladly-street, Portmadoc, for the Ynys-y-fan Local Board. Mr. Thomas Roberts, Assoc.-M. Inst. C.E., engineer.

Davies & Edwards, Aberystwith	£170 14 0
Owen, Portmadoc	163 0 0
Hughes, Portmadoc	132 0 0
Davies, Portmadoc (accepted)	104 1 6
Engineer's estimate	139 18 0

For villa residence at Wrotham Heath, Kent. Mr. H. Hardwicke Langton, architect. Quantities by Mr. W. C. Brangwyn:—

Nightingale	£1,206 0 0
Iggulden	1,029 0 0
Harris & Wardrop	997 0 0
Johnson & Co.	924 0 0
Charwood Bros.	970 0 0
Burgess & Langridge	943 0 0
Bishop Bros.	932 10 0
Fryer & Co. (accepted)	849 0 0

For additions to Cross Oak, Great Berkhamstead, Herts, for Colonel Hanbury Barclay. Mr. Frank E. Thicke, architect. Quantities by Mr. H. C. Leete:—

Hailey, Watford	£507 0 0
Matthews, Berkhamstead	465 0 0
Henderson, Highbury	429 10 0

For alterations to schools and new caretaker's house at Hollydale-road Schools, Peckham, for the London School Board. Mr. E. R. Robson, architect:—

Roy	£860 0 0
Pritchard	582 0 0
Good	529 0 0
George B. Ash	491 0 0
Jerrard	475 0 0

For alterations for Mr. Josephs, Newington Butts, Mr. Banister Fletcher, architect:—

Rice	£437 0 0
Cock	420 0 0
Young	414 0 0

For shops to be erected in Brent-street, Hendon (first contract). Mr. Banister Fletcher, architect:—

J. Eliaotti (accepted)	£1,450 0 0
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For warehouses Nos. 5 and 7, Pencock-street, for Mr. Henry Soden. Mr. Banister Fletcher, architect:—

Young	£721 10 0
Downs	835 0 0
Burman & Sons (accepted)	626 0 0

For alterations and additions to Thistleton Shooting Box, Preston, Lancashire. Messrs. Myres, Vevers, & Myres, architects, Preston and Westminster. Quantities by the architects:—

John Walmesley	£1,953 19 6
Richard Heathcote	1,798 18 2
Robert Saul (accepted)	1,740 0 0

For new residence, stables, &c., at Leyland, Preston. Messrs. Myres, Vevers, & Myres, architects:—

R. Heathcote	£747 0 0
R. Heathcote	728 0 0
Robert Saul (accepted)	705 0 0

For the construction of new roads on the Bridge House Estate, Brockley, for the Land Development Association, Limited:—

A. Oliver (accepted)	£1,224 0 0
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For the erection of a cottage and boundary-walls in George-street, Camberwell, for the Manor Stone Works. Mr. James W. Irwin, architect:—

H. Burman & Sons, Kennington	£248 13 0
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Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

G. T. W. P. B. R. B. have not space, much of the matter having been made public before.—S. H. cannot afford time to read such illegible manuscripts.—W. P. P. (no space this week).—J. W. H. (little).—W. P. B. (little).—C. P. (little).—M. P. B. (little).—Z. E. cannot publish letters that are printed and sent round to various quarters. See "standing order" below.—B. Bros.—J. and W. (cannot) should be sent.—J. C. (thanks); will consider it.—"A. Compiler" who was in "Time" (too late for us this week).—W. L. (last week).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Letters or communications beyond mere news-items which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 12, and a COLOURFUL TITLE-PAGE was issued the following week, in substitution for that published previously.

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The Builder.

VOL. XLVI. No. 214.

SATURDAY, MARCH 15, 1884.

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Architectural Draughtsmanship.*

WE cannot but look upon it as unfortunate that, at the moment when, for the first time, a combined effort is being made by the profession to remove the more glaring defects in our competitive system, a work should have appeared, from the pen of an architect, and addressed especially to the young and inex-

perienced, advocating the adoption of those expedients in design and draughtsmanship which are more than anything else calculated to perpetuate the worst faults of the system which call for reform.

The avenues to our profession are broad and unimpeded, and are every year thronged with a more miscellaneous multitude. As the crowd increases and the struggle for professional existence becomes intensified and embittered, it is not to be expected that the niceties of professional etiquette will grow, and it behoves us to guard with jealous care any observed tendency to lower the *morale* of those engaged in the practice of our art. It is, in fact, felt that some deterioration has already shown itself. We look back regretfully upon a type of which but few examples now survive. The high breeding, the wide erudition, the punctilious sense of honour, the graceful courtesy, the kindly heart and open hand are not, it is true, wholly unrepresented in the ranks of the profession; but they are, it is feared, becoming increasingly scarce, and are threatened with almost total extinction before the press and crowd of candidates for public favour who are actuated by quite other principles and have far lower aims. It is necessary, therefore, that we look well to our safeguards against dangers both real and imminent. Under this view the book before us is a little discouraging. The author sees clearly and says truly, that in future "competitions will be the chief means by which the young architect must hope to gain the prizes of his profession." The time happily has not yet arrived when the builder of a dwelling-house seeks his architect in the open market and dangles his patronage as a prize before the eyes of the whole world. Family considerations and personal reputation play, and will continue to play, an important

part in this direction, and long may they exert their wholesome influence. But public buildings of every kind are, year by year, more and more the aim and the reward of hitherto unrecognised ability. It is in some respects well that this should be the case. In no other profession, perhaps, are the highest rewards so completely within the reach of exceptional talent. The victories of Sir Charles Barry and Sir Gilbert Scott, of Burges, Street, and Waterhouse, were won in the open field, and the result has, on the whole, amply justified the means. Those architects triumphed by sheer force of genius over the vices of a corrupt system; and now we are said to be on the eve of a purification of the system itself.

In numerous recent instances great corporate bodies have evinced a real desire to keep these professional conflicts within reasonable conditions, and to award the prize with righteousness. The fact that the assistance of such competent and trustworthy advisers as Messrs. Ewan Christian, Barry, and Waterhouse, has been called in and acted upon, has reassured the whole profession, and benefited those who have adopted it by enlisting in their interest the best talent the profession affords.

It is, therefore, with a feeling of surprise and disappointment that we encounter such a sentence as the following in the chapter on Competition Drawing:—

"A more showy and brilliant style of colouring than strict good taste might warrant will often be found *needful*; effects striking and obvious aimed at; plain wall-surfaces obliterated; and as much cheap ornamental detail as possible introduced."

These meretricious arts are not mentioned to be reprobated. "They are, up to a certain point, permissible," although we must not sacrifice "too much to the shrine of vulgarity and bad taste," and "some limit must be set to pandering to the ignorance of a building committee." Architects are, in short, exhorted to furnish what will catch the uninstructed fancy of incompetent self-constituted judges, and other considerations are thrown to the winds. The burden of the writer's song is simply this:—Work comes chiefly by competitions. Competitions are won by meretricious draughtsmanship. Therefore, so draw that you may obtain the prize.

We are glad to find that the writer's name is not decorated with those alphabetical additions which indicate a connexion with the Institute, for we do not hesitate to call his book, in one respect at least, a pernicious book, and are almost sorry to advertise it by this condemnation of its principles.

Apart from its questionable morality, there is not much to be learned from the writer's numerous hints. We doubt the accuracy of

his statement that "much of the draughtsmanship that proceeds from even the better kind of London offices is *indescribably bad*," and are disposed to think that such contemporary draughtsmanship is on the whole exceedingly good. It is a lack of practical knowledge, and not a want of the skill of the draughtsman, which leaves so many otherwise clever young men unemployed or imperfectly remunerated. But our standard is probably not the author's standard. He thinks highly of the French method of illustrating architectural publications, and observes that we have nothing in England to compare with them. That is, in a sense, true. But have the French anything to compare with the crisp, characteristic, accurate brilliancy of many of the companion illustrations in our professional periodicals? The author would impose upon all the fine-line manner of the civil engineer, and reduce the art of architectural draughtsmanship to the uniform and insipid perfection of the Continental school. There is a place for both. We can admire the *Charivari* without shutting our eyes to the excellence of *Punch*, and we think that originality is a higher quality than the closest possible conformity to a fixed academic type. And English work is, by the author's own admission, original, inasmuch as it differs essentially from the work of the rest of Europe.

The book is offered by the author as a compendium of "thoroughly practical suggestions." Let us take a sample.

An architect is supposed to have received instructions to prepare (presumably in competition with others) a set of plans for a public hall to seat about 2,000 people. And this is the advice given to him. "Although a plan of the site will probably have been sent with the instructions, it may still be necessary to visit the spot and sketch the surroundings" (with an eye, it will be noted, to the showy and brilliant perspective, and not in order to adapt the dispositions of the structure to the *locus in quo*). "It may also be well to visit other buildings of the like kind." It may certainly, and such a course would probably suggest itself to the merest tyro. The preliminary tentative plans should be "done in pencil only" (as though any one in his senses would waste his time in inking them in) and the finished plan should be completed, commencing with the basement and working upwards,—a "practical suggestion" which will not be endorsed by the practical architect.

It is a relief to find ourselves in accord with the writer in anything, and we cordially agree with him as to the desirability of acquiring a mastery over freehand drawing, although we do not approve of his method of procedure. There are a few obscurities

* "Hints on Architectural Draughtsmanship." By G. W. Tuxford Hallatt, Architect. London: E. & F. N. Spon.

about his work, such as the prophecy that a "return to the modern style of architecture will inevitably result in a return to the modern style of drawing," and a few inconsistencies, such as the recommendation of the use of "rapid strokes" on page 17, and a caution against "hasty strokes" on the next page but one. But these are slight blemishes. His numerous digressions on the advisability of using good drawing instruments and "unwarped" drawing-boards meet with our entire concurrence, and so does his recommendation to the learner to practise by the light of electricity rather than by that of gas,—when he can get it. The writer is sensible that here and there he "strays a little from the subject," but hopes that, on the whole, his observations are "made in an orderly and intelligible manner." This orderliness and intelligibility are, perhaps, matters of opinion. We have no desire to set up as censors of literary style, accordingly we say nothing on this head; but, as Sir Fretful Plagiary observes, this we will say, that the inveterate discursiveness of the author does sometimes remind us of the widow Nickleby. The hints given can be of no use to any but the most uninstructed of students. The opinions advanced are, in many instances, at variance with general experience; the morality of the book is, at least, equivocal, and we do not therefore wish it the conventional "wide circulation."

A word to the young practitioner into whose hands the book may fall. He should remember that the most eminent architects of recent times have been the most accomplished draughtsmen, from Sir Charles Barry to Mr. Norman Shaw, but their drawings were only a means to an end. Their fame rests upon their works. In order that he may design like them it is desirable that he should learn to draw like them. He should also bear in mind that their most successful efforts were not directed to catch the vulgar praise of the uninitiated, but were approved by educated judges. He should look ahead and discern the signs of the times, one of which certainly is that in the near future the contests he may enter upon will be more frequently than in the past decided by professional judges, and that the highest prizes will fall to the most skilful designs and not to the most showy drawings, however much the wall surfaces are "obliterated" and despite the introduction of any quantity of "cheap ornamental detail."

NOTES ON THE MORTAR OF ENDURING BUILDING.

THERE have been various conjectures as to the date of the first use of mortar in the British Islands, as also with respect to the constituents of the materials used by the Greeks and Romans, and other nations of antiquity. Our oldest class of prehistoric structures, including Cashel or stone-built forts, clochans, or beehive-shaped erections, forts, and raths, are all of dry-wall masonry; but many of them exhibit good fitting and bonding, though no cementing material was used in their construction. The Rath-chambers appear to be the oldest specimens of stone-built work in the British Isles, the character of the work, of course, differing with the locality and the material obtainable. An examination of the most representative of this kind of buildings shows that no mortar nor any substitute for it had been used. The walls in some instances are built of surface stones and boulders, with the interstices packed with spawls; in other cases flat longitudinal stones are carefully placed together, and again, large blocks of all sizes and shapes are found well fitted in their natural forms. Indeed, there are examples of this class of building presenting masonry work of excellent character, well bonded and fitted, and showing to some extent an appearance of squaring and dressing. Our early Christian edifices existing show that mortar of very good quality was used in their erection, but even some of these buildings have uncemented walls. One thing is clear: whether the early Gaelic and British masons were skilled in the use of mortar or other cementing materials or not, they were certainly skilled in

an art more difficult, that of preparing and fitting the stone. Although there are none of those Celtic structures known as Round Towers in England, they are plentiful in Ireland, and two examples exist in the North of Scotland. If these buildings, which have given rise to such a voluminous mass of controversy, are of Pagan origin, as many able archaeologists and architects have contended with good reason, then the use of mortar must have been long centuries known in these islands before the introduction of Christianity. It is assumed by some writers on the Christian origin and uses of the Round Towers, that mortar or lime cement only dates in Ireland from the time of St. Patrick's mission. Now, it is a fact that the Romans used cements several centuries before Christ; and though the Roman legions never set foot upon the soil of Ireland, they carried their building knowledge into all their colonies, including Britain. The early Britons and the early Celts in Pagan times, as well as later, had constant intercourse with France and Spain, and other Continental nations, as the pages of Tacitus will testify. Although mortar or lime cements may have been used sparingly in remote times, nevertheless, we have good evidence of its high antiquity. The walls of the Acropolis of Pharsalia, and at other places, exhibit an unusual thickness, and are lined on both sides with large blocks, yet the interstices are filled up with small stones, and with earth or mortar. Again, the walls of Methana are constructed with a compact mass of small stone, with mortar, tiles, and earth between casings of regular masonry. The Greeks, in their art of building, cultivated the faculty of joining their large stones in such a skilful manner that they seem for a long time to have discarded the use of mortar as a binding cement. Whenever they did use it, they appear to have used it very thinly or sparingly. It became necessary for the Greeks in their massive and matchless buildings to make very close joints, and they often brought the surfaces of their stone so close that the points of union were not observable except on keen inspection.* Stones or lengths of masonry were often fixed together by means of oaken dowels, pegs, or bolts, or by cramp-irons let in or dovetailed. In the Coliseum at Rome, and in the Amphitheatre at Verona, cramp-irons were used to hold the free-stone firmly, but no mortar. One architectural authority is of opinion that it is possible that mortar might have been used "of a nature sufficiently fine and subtle to blend and assimilate itself in course of time to the masses of which it formed the cement." The Roman method of making ordinary building mortar did not differ much from the modern British method in use among the old school of respectable builders. The sand the Roman builders used was of different colours and qualities, and from the quarries or pits they excavated three sorts, black, white, and red; the latter seems to have been preferred. Though the Romans, as we have said, used a cementing material long centuries previously to the Christian era, the regular use of lime-mortar is of later introduction. The burning of stone into lime, according to some authorities, does not appear to have been brought into use until about three centuries before the Christian era. The sun-dried bricks used in the building of the Tower of Babel are stated to have been cemented with bitumen or pitch, and this and other material was used in different countries for centuries subsequently. When lime-mortar had been used for a while, builders soon recognised its advantages, and they often employed it in profusion. The Romans used it in plentiful quantity in the body of their walls, the lime being generally burned on the spot, and used fresh before cooling and crystallisation set in. Of course, when lime-mortar became well known among the Roman builders, they used it in all kinds of masonry and brickwork. Some of their rough stone or rubble walls were, in fact, a species of concrete construction through the ample use made of the mortar

they employed. The Romans as well as the Greeks used wooden wedges, dowels, and clamps of metal work in portions of their masonry, as well as mortar. The Roman brickwork of the first century appears superior to that of a later period, the bricks being of large size, flat, and thin, usually 2 ft. square, and 1 in. thick; in fact, what may be termed tiles, though used for wall building, and not only for paving or roofing. After a time the bricks were made of diminished size, but thicker, and continued to decrease down to the fourth century, when they counted only four to a foot in the surface of the wall, as in our modern brickwork.

In the British Islands, although the burning of lime and the use of mortar were known at an early date, the craft of the bricklayer was of late introduction. The Mediaeval masons were particular as to the quality of the mortar they used in their best work. The buildings of the eleventh century in England and France are often massive, the stones large, and the mortar-joints wide; but later on, excellent masonry exhibiting thin joints became more characteristic of the work of the Middle Ages. Whether, however, our British masons elected to build with wide joints or with close ones, they did not neglect to use good mortar. In important or particular work, it is known that the Mediaeval masons used an admixture of skimmed milk in the preparation of their mortar. Few instances of English brickwork occur previously to the fourteenth century, and the scant specimens found before that period may be put down to the using up of old material left by the Romans. In the fifteenth century and onwards, English brickwork became common, and in the sixteenth and seventeenth century fine specimens of ornamental work in brick material were numerous. The mortar employed in this brickwork was generally of the best description.

George Semple, an architect in practice before the middle of the eighteenth century, and who towards its close published a treatise on "Building in Water," was one of the first, if not the very first, of our modern architects to suggest, and carry out, foundations by concrete. Semple came of a generation of builders, his father being a building workman in 1675. George Semple's own practice extended over a period of sixty years. Speaking apart from hydraulic mortars, or those kinds specially made for setting under water, Semple said, "I can safely affirm, that good mortar,—that is, mortar made of pure and well-burned limestone, and properly made up with sharp, clean sand, free from any sort of earth, loam, or mud,—will, within some considerable time, actually petrify, and, as it were, turn to the consistence of stone." And, no doubt, it will under favourable circumstances, though for expeditious building under water and quick setting, the employment of mortar made of hydraulic lime is indispensable. The practice of the older masons in the British Islands employed in the building of churches, castles, and other large structures appears to have been to this effect. After they laid the outside course with large stones in swimming-beds of mortar, they hearted their walls with spawls and smaller stones, and into this body of their work they poured a quantity of boiling or hot lime, liquid, and mixed, of course, with sand. This grouting process was supposed to lead to the incorporation of the mass of small stones together. It was believed that the heat exhausted the moisture of the outside mortar, and united firmly both it and the stones. We have ourselves examined the mortar in several old castles, and the walls of ecclesiastical structures, and we certainly found that a process similar to that we have described must have been more or less followed by our masons, as the mortar and small interior stonework was in a compact or concrete mass, and the former proved harder to break than the stones. Good ordinary building-mortar is composed of one part of lime to three parts of sand, the water being added gradually in such quantities as the tenacity of the mortar requires, and this will be generally obtained when about a third of the bulk of the material has been added: clean river sand, sharp or angular in the

* See Mr. Parroze's work on the Parthenon for a description of the manner in which the close-fitting joints of the drums of the columns were probably worked.

grit, is the best; and when pit sand is used it should be well washed to free it from loam. Sea sand should of course not be used in domestic dwellings, though it often is. It will do very well for outbuildings. If builders or workmen could be depended upon generally to give sea sand repeated washings in pure fresh water, thoroughly expose it to the weather and sun, and subject it to constant turnings, there would be less risk in using it. But as this care is not to be generally expected it is better to discard sea sand in favour of well-washed pit sand. When sea sand is used, on account of the saline matter in it an efflorescence on the walls within and without the building is certain soon to manifest itself. When such sand is both used in the mortar and plaster work, dry rot will often make its appearance, to the destruction of the flooring and joinery work.

Though a mixture of clay in all sands is pernicious, it is otherwise a valuable ingredient in limestones, as the burning converts it into a useful agent. In sand, however, the clay causes the destruction of the mortar in a few years. Apart from the hydraulic kinds, lime is divided into two general classes, called rich and poor, according to their constituents. The former, or rich limes, contain little silicate of lime in proportion to pure carbonate of lime, being composed of one part of the former to nineteen parts of the latter. They are termed rich because the stones from which they are procured imbibe a large quantity of water when slaked, thus increasing to a great extent in bulk and weight. The mortar of the rich limes rarely becomes thoroughly hard, but it is useful for inside plastering and other purposes. The poor limes, produced, for example, from oolitic limestones, contain a large percentage of metallic oxides, and insoluble flinty grit. They are called poor because they do not increase in volume to any extent after being slaked. In this respect they are somewhat similar to hydraulic limes, but differing from them in not possessing the property of setting or rapidly hardening under water. Perhaps not one person in a thousand of makers or users of mortar knows what causes its induration or hardening; but though we cannot yet expect building labourers to know the chemical changes that lime and mortar undergo in their preparation, yet our builders generally ought to know a little more about the subject as a body than they appear to do. The hardening of mortar is partly caused by its absorption of carbonic acid gas from the atmosphere, but chiefly to the combination of part of the water with the lime. A good strong building mortar can be made with three parts of fine sand, four of coarse, and one of quicklime freshly slaked. Another excellent and enduring building mortar can be made with three parts of fine sand, cement of well-baked bricks three parts, and slaked and unslaked lime, each two parts. Water ought to be used sparingly in slaking lime and making mortar; but where it is made by the hand, free from inspection, the labourer, to save himself trouble and brow-sweat in mixing, adds a large quantity of water, and thus the mortar is "perished," or spoiled. In summer, or hot, dry weather, both stones and bricks should be well soaked with water before they are used, as the mortar unites better, and takes a more firm hold. Before pug or mortar-mixing machines or mills were introduced, the old class of respectable builders insisted upon careful mixing, and no stint of what they termed "elbow-grease" on the part of the labourers. Formerly the men used wooden beaters, but though mortar is still extensively made by the hand, yet in all large works the pugging-mill may now be seen in operation. Many ingredients were formerly, and some are still, used for increasing the tenacity and hardness of mortar. Burned bones have been found to improve mortar, by giving it a greater tenacity, but the addition should not exceed one-fourth of the lime. A blue mortar for special purposes is made in London by the admixture of ashes and iron dust of a smith's forge, which is often used for covering such parts of a building as are much exposed to the weather. Again,

certain qualities of fairly good mortar are made up of ground bricks, burned clay (termed ballast), and the slag from glass and iron furnaces reduced to fine powder by machinery. Here, however, we are trenching upon the subject of cements and special kinds of mortar, apart from the strictly building kinds. Chalk lime slakes very freely, but it possesses much less strength than stone lime in mortar, being much better suited for plastering purposes than for building. As filtered water is good for drinking, so is it for mortar-making, but filtered rain is the best kind of soft water, and next comes that which can be found free from mineral agents. As hot water has been mentioned in writings of antiquity, it has been recommended by some individuals in modern times, but we do not see wherein its special value lies. Few words need be wasted in describing the rubbish called mortar used so extensively of late years by the lower class of speculative builders. This class of operators press almost anything in the shape of clay, vegetable mould, cinder ashes, and road scrapings, into their service. What they call "ballast" is not burned clay, but a libel upon the name; for burned clay well ground makes a fairly good substitute for sand in mortar-making, with the addition of a proper quantity of lime.

We must stop here, though we may furnish a sequel on another occasion, in further illustration of the mortar of enduring building.

SOME ARCHITECTURAL DRAWINGS IN THE LOUVRE.

WHATEVER less evident influences may have been worked by the effects of the searching character of modern criticism in matters artistic, it is impossible to deny that to its efforts one result can be directly traced,—the directing authorities of our great public collection have been urged to carry out reforms of a nature which have long been clamoured for in vain. The necessity for methodical classification has at last been recognised, and of late years the advance made in this direction, slow as it may have been, is none the less worthy of grateful recognition, considering the grudging manner in which funds and space, those two absolute necessities, are granted by the State. There remain, however, within the power of our museum authorities certain improvements, which it may be remarked do not need in quite such an imperious manner the two requisites of space and means; what is required is rather a little of that simple classification which is found so absolutely necessary in the conduct of any business, and of which, as has been again and again pointed out, the order of Nature itself,—the Cosmos of the classics,—stands forward as the most striking example. With the treasures now in our possession there will remain little other work for the near future but the methodical classification of these possessions with a view to a proper use being made of them as a means of instruction.

Probably in few directions less than in that of a classification of the drawings of the Old Masters has any advance been made of late years. The traditions of a vanished past still affect our museum authorities in respect to the mode in which they display the drawings in their charge. As for the British Museum, want of space, it is true, has been the chief obstacle, an obstacle which still exists, in spite of the removal of the Natural History collections to South Kensington, and so for a period the collections we suppose must remain locked up in the morocco-bound portfolios of the Print-room.

In the case of the Louvre there is certainly, thanks to the size of the old palace, a more adequate display of the collection of drawings, though it is reported to consist of no less than 35,000 separate "pieces." Among the many specimens framed,—and more recently displayed in the turning cases with which the South Kensington Museum first, if we mistake not, made the world acquainted, it can be understood that not a few are essentially architectural, and the interest of these few leads to a regret that a more adequate display should

not be made. As it is, a very large number of questionable works occupy, owing to the influence of old traditions, valuable space, which might be better employed.

Such a drawing as that which meets the eye only a moment after ascending the historic staircase of the Louvre, and entering on the left the first room of the wing devoted to the *Dessins*, a drawing attributed to Ghiberti, amply serves to show how interesting a collection might be gathered were some classification followed. The drawing, judging by a MS. note, is the design for a niche in Or San Michele, the niche containing the statue of St. Stephen erected by the once important wool-staple of the busy Tuscan capital which, in those and still earlier days, traded so largely with our distant shores. Almost by the side of this drawing, a study by Taddeo Gaddi offers a characteristic example of the happy union between the sister arts, for though the work is clearly intended as the study for some mystic picture, the importance of the architectural design of the temple represented will instantly appeal to the professional eye as showing in its delicate colour, its Gothic tracery, and especially its inlaid marbles, a design of the period to which we owe the creation of Santa Maria del Fiore. To a later, but no less interesting, period belongs the study of a sixteenth-century tomb by Bambaja, a good specimen of work such as our South Kensington Museum has rendered familiar even to those who have not enjoyed the privilege of crossing the Alps.

In the more recently-introduced turnings, cases the architect will find a larger field of study than in the older collection framed on the wall. Here one lights upon a large number of drawings by that active Italian artist, Primaticcio,—clearly studies for the decoration of the palace of Fontainebleau, to adorn which he was, it may be remembered, called to France in company with a number of his artistic brethren. Frescoes, ceilings, designs for chimney-pieces, and a mass of decorative motives generally from his fertile pen, will be found; sketches which were mostly carried out by Nicolo dell' Abbate, by whom several works will be found in the cases. It would be difficult to imagine a more interesting architectural drawing than that by Holbein, the design for the façade of a house decorated with frescoes, as was the wont in the Renaissance, a custom taken from Italy, where to this day in the less frequented towns of the Venetian *terra firma* still exist numbers of examples of a branch of art which so successfully combines the skill of the painter and the architect, and which, within a few years, has been most brilliantly revived in Munich. As entering into the same category should be mentioned the large number of studies by that delightful historian of Italian art, Vasari, chiefly designs for ceilings,—one important example clearly for the ceiling of the Palazzo Vecchio at Florence. A considerable number of sketches by the industrious Perino del Vaga will be found, one more than usually interesting, representing the façade of an Italian palace of the *cinque cento*, with its generous *portone*, the origin of the French *porte cochère*, surmounted by a boldly-designed shield, bearing the arms of the owner,—an instance of the happy architectural use made in the past of the decorative qualities of heraldry, the traditions of which seem to have entirely disappeared from our modern professional training. More than one detail of windows in the Renaissance style, by Bernardino Poccetti, deserve mention, contrasting curiously as they do with the cold severity of the famous Siennese architect, Baldassare Peruzzi, by whom a valuable study of a portico will be examined with interest by students of the Renaissance.

As belonging to the same period a number of studies of *grottesche* by Giovanni da Udine, the assistant of Raffaele, it may be remembered, in the decoration of the Loggia at the Vatican, should not be overlooked, but of far greater architectural interest is the superb drawing said to be by Vasari,—on what authority it is difficult to say,—of the ground-floor of a graceful Renaissance building in a Sansovin-
esque style, strikingly recalling the Libreria at

Venice. Above this design the sheet of studies of quaint Renaissance capitals is also interesting. Of the same active period is the Renaissance, but at a very different and later moment of its development, the study of Alonzo Cano offers a contrast to the sobriety and graceful purity of the study attributed to Vasari. In one feature, however, the work is characteristic, the power of draughtsmanship exhibited, the complete knowledge of the human figure on the part of the artist and the ease with which he exercises his imagination, qualities which in their exuberant exaggeration stand in marked contrast to a design not far off, of a niche attributed to that delicate Florentine artist Nino da Fiesole; the design, attributed to Bramante, of a church of the basilica form, so much affected in the Renaissance period, is curious, but little else.

Far more interesting are the two superb studies by Galli da Bibiena of the interior of a theatre, one showing the design of the central royal box, a disposition still retained at the Munich Hof-Opera; the second, the design of the proscenium. Tinged with "rococo" as these are, it will be found they are none the less pervaded by that subtle quality of "style," not very much developed in modern theatrical architecture. To more than mention the number of decorative and architectural designs by Romanelli and a host of other artists of the industrious Italian school of the sixteenth century would carry us far beyond the limits at our disposal.

It is curious to see the vivid imagination and power of the Italian school which gave it so justly a reputation and ample employment in every portion of Europe, slowly and surely inspiring the newer French school, which in Lebrun and the splendours of the court of the Grand Monarque, is not inadequately represented here, though we feel certain that a very much more interesting gathering might be made from the portfolios not accessible to the public. In the rooms devoted to the pastels and chalk drawings will be found another series of turning-cases which contain almost all the architectural drawings exhibited. Here Lebrun, the great art director of the period of Louis XIV., reigns supreme; architectural designs of façades, of interiors, of triumphal arches, of fountains, frescoes, and what not, formed from his busy hand and busier workshop, for in him Louis XIV. found precisely the artist in whom was incarnated the spirit of pompous magnificence which presided over the erection and decoration of Versailles. Amidst the many drawings belonging to this period none, however, is more interesting than the design attributed to Boulle, the master-cabinet maker. The piece of furniture is the design for just such another *armoire* as that sold at the Hamilton sale for 11,500 guineas, and which, curious to say, was formerly in the Louvre, a marvel of inlaid ebony and brass, of pewter and tortoiseshell, of ornolu mouldings and *mascarons*. The design by Bernard Picart of a coach of the same period cannot fail to interest the English visitor as reminding him of a familiar feature of a threatened institution, the state coach of the Lord Mayor.

As an architectural drawing of great artistic merit the charming view of the Palais Royal in 1785, by L'Espinasse, is certainly worthy of a better fate than interment in a turning-case. To a very different period belong the several delicate designs by Etienne Delaunay, the French silversmith of the Renaissance, by the side of which takes well its place the superb-coloured architectural study for a fresco-decorated ceiling by Toussaint Dubreuil, of the refined period of Henri Deux. Among the more recent acquisitions in the collection bequeathed by M. Gatteaux, an interesting sketch by Filippo Liano, "Il Napolitano," representing the mechanism for raising a heavy column, is noteworthy; but the chief architectural feature of this portion of the collection is, unquestionably, the masterly (anonymous) design of the interior of an amphitheatre in the Renaissance style of Sansovino. It would be difficult to imagine a more perfect specimen, not only of design but of draughtsmanship, and should the drawings of this portion of the Louvre be reproduced,

we would earnestly counsel that this beautiful study be among the first published.

The observant eye of the visitor may, doubtless, in a walk through the galleries, detect some few others than those specimens of which we have spoken, but our notes will, we hope, suffice to show the interest, from a professional point of view, of a portion of the museum of the Louvre not sufficiently known to the casual foreign visitor to the famous palace of art on the banks of the Seine.

NOTES.

It is common to speak of the present condition of things in London as though it were something unknown in the past, and due solely to the negligence of the present generation; yet, if it be right at all to term overcrowding a disease, it is a disease of long standing. Aggravated though it may be by circumstances in these days, there never was a time within the last 400 years when it was not to be found in London, and when it did not meet with more or less attention. Statute after statute was passed, dealing with it, and especially during the reign of Queen Elizabeth do we find the Lords of the Council urging upon the Lord Mayor the duty of putting the law into execution. In 1583 the Lord Treasurer, — who was none other than Lord Burleigh, ancestor of the Marquis of Salisbury, — tells the Court of Aldermen that the number of new buildings in and about the City was excessive, "to the danger of pestilence and riot," and that they must at once proceed against such as had transgressed the Queen's Proclamation either by erecting houses or by dividing single tenements, and bring them before the Star Chamber. Ten years later (1593) the Lord Mayor is again bidden to prevent the erecting and overcrowding of small tenements within the City, and the deputies of each ward are ordered to make search, and in cases of overcrowding remove the inmates, "according to the statute." That statute (35 Eliz. c. 6) expressly declares that "great mischiefs daily grow and increase by reason of pestering the houses with divers families, harbouring of inmates, and converting great houses into several tenements, and the erecting of new buildings in London and Westminster."

But nothing shows more clearly the impotence of law than the continuance of the evil against which law after law was directed. When, as in 1625, pestilence raged throughout the land, and showed itself most severely in crowded cities, a "bitter cry" against the perils of overcrowding went up, and greater care was for awhile bestowed upon enforcing the law. But the policy of *laissez faire* quickly reasserted itself, and in 1632 it was the Corporation's turn to appeal to the Lords of the Council for protection against the dangers with which suburban overcrowding was then threatening them. "The newly-erected tenements in Westminster, the Strand, Covent Garden, Holborn, St. Giles's, Wapping, Ratcliff, Limehouse, Southwark, and other places had brought great numbers of people from other parts, especially of the poorer sort, and was a great cause of beggars and other loose persons swarming about the City, who were harboured in those out-places." The prices of food were enhanced by the growth of population, the sewage was dangerously increased, and, if any pestilence were to break out, the City would suffer terribly, from being environed by such reckless folk." A special committee, consisting of the Chancellor of the Exchequer and two Secretaries of State, was appointed to advise with the Commissioners for Buildings, and report to the Council, and the result seems to have been the issue of a new and more stringent Proclamation on the subject. Power was given to the Lord Mayor and Sheriffs of the City and to the Justices of the Peace to enforce the orders for demolishing all new buildings erected within the City or suburbs contrary to the King's Proclamation, and the Order in Council directed the above authorities "to stay the erection of certain buildings by the Earl of Bedford in a passage or alley leading from Covent-garden to St.

Martin's-lane." It is clear from this order that something definite was intended, and that even the great landlords were not beyond the scope and power of the law. Still, the evil seems to have outrun the controlling operations of the Legislature, and as late as 1661 the Lord Mayor was again called upon to put in force the same Proclamation for restraining the exorbitant growth of new buildings in and about the City, and for regulating the manner of all new buildings. The former provision was effectively carried out by the Great Fire of 1666, which for awhile rendered further legislation unnecessary.

The shelving of the Metropolis Water Bill on Tuesday night was obviously due more to a feeling that the promoters of the Bill had gone the wrong way to work than to any reluctance on the part of the Legislature to see the subject taken in hand in a systematic manner. The fact that the two principal opposers of the Bill were Members particularly interested in Water Companies in itself speaks volumes as to the degree of public spirit involved in the discussion. The promoters of the Bill, on the other hand, gave excuse for an accusation of "confiscation" being raised against them, the grounds for which charge may be found set forth in a delightfully one-sided pamphlet entitled "Can Parliament break Faith?" representing a conversation carried on between a representative and an opponent of the Water Companies, in which, of course, the former has it all his own way, and the latter has not a word to say. The Water Companies, however, need not flatter themselves that the question is settled; it is only postponed. The subject of supply by meter has been rather misrepresented. So long as this is optional, the cry about the two millions that will have to be spent on meters has little force; nor is there, to our thinking, much more force in the argument that meter supply would lead to an unsanitary reserve in the use of water, except on the part of those who are indifferent to water on any system of supply. On the other hand, some such check on waste as a meter supply would involve may be found, at no distant date, to be almost necessary.

THE Parks Railway and Parliament-street Improvement Bill passed its second reading on the same evening, and was referred to a Committee, which, we hope, will include those who have both the knowledge and impartiality necessary to deal with the subject. In spite of the decisive and repeated assurances of the First Commissioner, given, we have no doubt, in good faith, there seems every reason to believe that the proposed railway will spoil the Parks to some extent, as it does not appear to be denied that cuttings will be required in part of the route, unless the tunnel be sunk to an inconvenient depth. On the other hand, there is the unquestionable fact that a cross railway route will be a great convenience to many, more especially if it be connected with the existing Metropolitan and District lines, an important factor in its usefulness which must not be overlooked, and about which Mr. Labouchere was to move a resolution on Friday evening. This will, in fact, make such an immense difference in the utility of the line that we should be disposed to say that the scheme should stand or fall on that point. An amusing feature in the debate was the posing of Sir E. Watkin as a friend of the working classes, desirous chiefly to find labour for them, and anxious about the railway solely on philanthropic grounds.

In relation to the subject of tapestry, Prince Leopold has addressed a circular-letter to the Mayors of the principal towns in England and Scotland, calling attention to the possibility, by means of the facilities afforded at the Windsor Tapestry Works, of reviving the art of tapestry in this country, and also of repairing in the same style and without incongruity the specimens of ancient tapestries, many of which are in a state of decay. The latter would be perhaps the more difficult task of the two. The revival of tapestry is, no

doubt, as a method of decorative art, a matter of much interest; but we do hope that if anything is attempted on a large scale in this direction, the mistake will not be made of imitating the misapplication of tapestry, in many old examples, to such subjects as realistic landscapes and groups of figures. The material will not bear such treatment, more especially not landscape, which becomes at once vulgarised in tapestry; of which fact we noticed some melancholy examples in a recent exhibition in Bond-street. A purely conventionalised and decorative treatment is what tapestry really is fitted for. Otherwise used, it becomes like the art of a childlike taste, which much of the old tapestry really was.

THE two following quotations, in reference to the treatment of Hyde Park Corner, speak for themselves:—

Builder, June 23, 1883.

Pall Mall Gazette,
March 7, 1884.

"One capability of the site [Hyde Park Corner] as laid out, we may point out, though it is one that is obviously purely accidental, and is traceable to no forethought or consideration in laying out the plan. It will be found that if the centre line of Constitution-hill be produced to the plot of ground opposite the Hospital, it will there meet a centre line produced from the middle entrance of Hyde Park-gate, at right angles to Piccadilly, and that the two lines will meet in the centre of the plot opposite the Hospital. There is thus, at least, a possibility, by good luck, of giving some point to the site by placing a central object, either a large fountain or a memorial trophy of some kind, in such a position that it will be seen centrally through the arch on coming up Constitution-hill, and will also be seen centrally from the park through the centre arch of the screen."

It might have been better taste for those who appropriate our ideas to acknowledge the fact; but what is of more consequence is that they should know how to appropriate them. It surely seems a matter of ordinary common sense that an object which is to be placed at the meeting of two lines of sight at an obtuse angle, should be one which should "front all round," so to speak, such as a fountain or a trophy; but the men of Gotham who manage these things in London forthwith propose to place at such a point an equestrian statue, which can front only one way, and must be oblique to the other line of sight! As an indication of the further possibilities in store for us, it is mentioned that "an eminent architect" (we should like to have that eminent architect's name) has suggested that "instead of the quadriga designed by Burton, the structure should be surmounted by the royal arms in stone flanked by two sphinxes." "Bless thee, Bottom!"

THE Institute Committee on Competitions, of which Mr. Cole A. Adams and Mr. Aston Webb are the honorary secretaries, although for some time silent, has not been idle, as the appeal, which most architects practising in the United Kingdom will by this time have received,* will show. The proposal of the committee is that every British architect shall engage not to enter upon a public competition, unless the promoters of it give an assurance that the award shall be made upon the advice of a professional architect, of established reputation. Surely nothing can be more reasonable, for not

only would the public and the profession be the gainers, but the instigators of competitions would themselves be relieved of the suspicions which now,—and sometimes perhaps unjustly,—attend their preferences. So large a majority of architects are in favour of the principle advocated, as to constitute practical unanimity on the point, and it is to be hoped that the list of architects supporting the proposition will be as long and comprehensive as the most ardent advocate of a much-needed reform could desire. It will ease some minds to note that private or limited competitions are not included in the proposal, which it is proposed should come into operation after the middle of the present year.

A WELL-KNOWN member of the profession draws our attention to the conditions for the New Borough Asylum (Derby) competition, about which there has already been some correspondence in our columns. It appears that in reference to the employment of the architect whose plans may be adopted the stipulation is inserted, "The rate of commission to be stated." It need hardly be observed that to put any body of professional men in the position of costermongers, who can be haggled with for their prices, is a most disrespectful attitude to assume, and one which the members of any liberal profession would highly resent. Imagine asking a selection of barristers to state their fees, with a view of engaging the cheapest. What wigs would there be on the green! But the committee who make this request are not, perhaps, alive to the possible consequences to their own interests. An architect who would agree to carry out the building for a commission lower than that recognised by the heads of the profession would very likely be capable of entering into other agreements of which his clients would know nothing, but for which they would pay, nevertheless.

THE Society of Lady Artists opened their annual exhibition at 53, Great Marlborough-street, this week, the collection numbering more than 750 drawings and oil-paintings. The exhibition has thus considerably enlarged its borders since it started, and has not fallen off in quality; at the same time we feel some doubt as to the *raison d'être* of such an exhibition at all. Why do lady artists desire to have a collection of works apart from those of the other sex? Is it that they wish to be judged by a special and more indulgent standard of criticism? We should hardly think so; at least, that is not the prevalent tendency of feminine feeling just now. Do they wish to show how superior is their work to that of men? Probably those of them who can do best would be furthest from making such a claim. But our conclusion is, that the best works here would have equal claim to a place in a mixed exhibition, and those which would not are hardly worth exhibiting. Among the best contributors are Mrs. Naftel, Miss Hilda Montalba, Mrs. Marrable, Miss Moultrie, and Miss Wratislaw, who sends a good architectural interior. We observed that no sculpture of any kind was exhibited. There are some very clever modellers among the ladies; we presume they have their own reasons for keeping aloof.

We record with great regret the death, at the early age of 37, of a lady who was indeed an eminent artist—the most eminent in her own walk—Mrs. Angell, whose exquisite paintings of flowers and still life may be said to have elevated subjects secondary in themselves to a much higher level of interest than is commonly accorded to them. Artists, indeed, love still-life work, as affording one of the best and most thorough means of acquiring and exhibiting artistic training; but to the majority of exhibition-goers they are passed over with little perception of the truly artistic power which may be displayed in such subjects. Mrs. Angell's work was to some extent an exception in this respect; it compelled attention even from those who were possessed of but little critical insight, though, perhaps only artists fully appreciated her powers. We have

often, in noticing the exhibitions of the Royal Society of Painters in Water Colours, commented in terms of admiration on her beautiful and powerful works, which were usually among the finest pieces of drawing and colouring in the collection, and in the case of flower pieces rose fully to the poetry of the subject.

MR. STORY-MASKELYNE'S motion for a Select Committee "to inquire into the operation of the Acts for the Preservation of the Thames, and the steps which were necessary to secure the enjoyment of the river as a place of recreation," was agreed to on Tuesday night, and by no means too soon. It is all very well for riparian owners to write highly-coloured letters to the papers about the nuisance caused to them by roughs who have landed on their lawns from the river; but why is an owner on that ground to stop the access, say to a beautiful backwater adjoining his grounds, sometimes by the expedient of straining a concealed wire across it, an operation which might lead to fatal accidents? Let him fence his own bank, as he would fence all other boundaries of his property, if he wishes to keep "roughs" off it, and not selfishly demand that the Thames should be regarded only as the ditch bounding his property. We hope the Committee also will give some consideration to the disfiguring of the Thames by such monstrosities as the gridiron at the head of weir above Hurley, and other threatened erections in the way of hideous iron bridges at various points. We have a beautiful river, which some people seem only to wish to spoil, and it is time that its preservation should be systematically taken in hand.

It appears that the inventive genius to whom we owe the development of that æsthetic home, Bedford Park, has formed a scheme to promote building on a site adjoining Whitehall-yard, behind the public gardens on the Embankment, and, according to a plan and description given in the *Pall Mall Gazette* of the 11th, to form a new street, to be called Whitehall Avenue, running from Whitehall-place (opposite the Hôtel Métropole) to Whitehall-yard. The "Whitehall Court Company, Limited," has been formed to carry out the scheme, in which apparently will be included the building for the new Liberal Club. We have no doubt style in architecture will be considered; but we venture to suggest that solid building should also be regarded as a *sine quâ non*, and that no such gimcrack construction as that which characterises many Bedford Park houses should be tolerated.

THE ARCHITECTURE OF ENGLISH FICTION.*

IN resuming the occasional consideration of a subject which more immediate calls on our space have interrupted for a time, we may observe that, if we have had reason, in a former article, to complain of the neglect of architecture at the hands of the earliest novelists, no such charge can be laid at the door of their followers in the field of Romantic Fiction. Architecture is the very staple of their art,—its inspiration and the vehicle of the strangest part of their very strange stories. It was Walpole's dabbling in architecture, as he expressly tells us, which led him to excooperate that inconsequent farrago of absurdities which marks the renaissance of the romantic school, and which he christened a "Gothic story." Medieval architecture was to the eighteenth-century mind a thing of gloom, mystery, and superstition: the Gothic fane was the antithesis of the light-some grace of Classic temple,—the appropriate framework of the *bizarre* and the incredible. Whether the brilliant literary trifler, whose real character and motives are an insoluble enigma, was in earnest or in jest is a subject which has been discussed frequently and to no purpose. The balance of probability is on the side of the surmise that while he was thrilling our great grandmothers with horror he was laughing at them in his sleeve. The machinery of his story was the machinery of burlesque, and burlesque at its wildest pitch of extravagance. Preposterous helmets "a hundred times more large

* We are asked to state that the Hon. Secretaries of the Competitions-Memorial Committee have named, in a recent copy of their circular to every architect in the United Kingdom, as far as they could ascertain; but if any member of the profession has not received it, he will be very glad to send to any one who may write to Mr. Cole Adams, 14, Holden-terrace, Grosvenor-gardens, S.W.

* See vol. xlv., pp. 790, 848; and p. 54, *ent.*

than ever made for human being, and shaded with proportionable quantity of black feathers" are endowed with volition, and crush and imprison unexpecting and innocent victims. Pictures wink and nod at the astonished spectator, and step out of their frames to fright him with their unnatural antics; and marble statues are afflicted with the most unromantic weakness of a bleeding at the nose. Mr. Burnand, in his latest mood, is not so shamelessly and wantonly grotesque. And all this was taken by our unsuspecting ancestors *au grand sérieux*, and the new manner was so successful that imitators sprang up on all sides from the brakes and bushes of literature like the warriors of Rhoderick Dhu. The architecture of this form of romance was unfortunately as unreal and pantomimic as the incidents with which it was associated. The basement of the Castle of Otranto was "hollowed into cloisters," approached by "staircases," and its subterranean vaults had trap-doors, opening with a lock and a spring, and always conveniently handy for the exigencies of the distressed heroine and the progress of the preposterous story.

The tragi-comedy is, moreover, enacted in a castle which must have been built in the eleventh century, and, stranger of all, Sir Walter Scott could describe this fanfaronade as abounding in "nice accuracy of delineation," which compared favourably with "the less successful efforts of later writers." Certainly, if the later writers were less successful, Walpole is entitled to the compliment; but their want of success would be described with "nicer accuracy" as utter failure. It is true that even Walpole's travesty was travestied by imitators who had infinitely less knowledge of Mediæval art than he: there is, in fact, no sillier page in the history of English fiction than that occupied by the authors of the romantic novel of the last century. Beckford's weird romance is a work of art which cannot be judged by ordinary measure of its kind. It is perfect, and the first and last of its school. Its architecture is consistent and grand, but his castles are castles in the air and defy criticism. One writer must be excepted, in a measure, from the sweeping charge brought against the Romantic school. On the day of Walpole's death a child was born who was destined in after years to "hand on the sacred torch" of Romantic tomfoolery. Apart from their gratuitous mysteries,—mysteries which in the end resolve themselves into the simplest causes,—Mrs. Radcliffe's stories have more power and less of the impossible than the works of her great exemplar. Architecture is amongst the most important of all the "properties" in her melodramas. She was an adept in the description of natural scenery, and she knew it. On every page the broad landscapes of France and Italy are spread out before us. We are for ever invited to gaze on the wide expanse of peaceful valleys, or to contemplate mountains of preternatural height and gloom. The glories of the dawn and the saddening glow of the declining day meet us at every turn, until, as Mr. Puff says, the sun is never allowed to rise or set in peace. In every picture a convent wall is found nodding on the craggy steep or nestling in its umbrageous clefts, and from every coign of vantage a fortress or a castle frowns in the most orthodox manner. We can forgive her *penchant* for landscape-painting because she does it well, and her pictures are all based at least upon outdoor studies. Not so her architecture. The exteriors of the terrible strongholds which are necessary to the development of her stories, though highly artistic and adapted to her aims, are scumbled over into a sort of mysterious indistinctness which is impressive in proportion to its lack of individuality. No writer has had in such full measure the art to suggest by a few strokes of the pen an effect which was strong enough to excite the imagination without satisfying it. The whole of her art was of this order. She deals in hints; mysterious noises alarm, and awful presences are felt, not seen, and we shudder we know not why. But this treatment will not answer for the interiors of the castles in which her scenes are laid. And in proportion to the precision with which she necessarily makes out her pictures, their impressiveness evaporates, and their unreality is apparent. It is simply impossible to make anything out of the plan of the buildings which she half describes. They have no plan, and we are the more sorry that the system of study which she adopted with her landscapes was not carried out by her in other

matters. She adds galleries and chambers and cloisters *ad libitum*, and in a small mountain fortress multiplies her vistas of vaulted passages to infinity. A common hall is in one case divided by numerous rows of columns of "solid marble"; it is vaulted, and the upper part is "adorned with fretwork." The winds of heaven find an "easy entrance night and day," and damp and mildew disfigure its walls, but it is shut in nevertheless by "folding doors" (glazed also probably) which slam with the wind, and their melancholy noises echo down interminable lines of vaulted corridors, dying, dying. It may be said that this writer's works abound in "passages that lead to nothing." They certainly abound in passages which lead to dungeons, and dismal chambers without end and without object, and, whether ignorantly or of set purpose, the picture she uniformly presents to us of a Mediæval castle is of a structure of mystifying and unmeaning complexity. But if she is indefinite she is never absurd with the persistent absurdity of the feeble writers of the school. The French château was a favourite subject with her, but she gives us only glimpses of it between the embowering foliage. A gleam of white wall, a "lattice" provided for the convenience of the heroine who languishes thereat and escapes thereout,—a turret and a towering chimney-stack. She well knew the interiors and exteriors of this picturesque class of building, but she expended no pains upon their clear delineation, and in all her prolixity of description has left them practically undescribed. The crowd of writers who followed in her steps and imitated her manner were far more ignorant than she of the characteristics which it was thought becoming and necessary to import into their improbable and incongruous tales. Although she leaves us disappointed and unsatisfied, she does not shock us by the rubbish which disfigures their pages, and we are accordingly grateful. Only one writer essayed to combine the charm of realism with the charm of old romance, the Wizard of the North, at whose touch the past lived again for us, and in whose magic mirror its works received a new beauty and a new meaning. His works afford an inexhaustible field for the searcher after the "architecture," and although we cannot pretend to collect all his descriptions and allusions which bear upon the art of the past, we may be sure that by opening at hazard the many volumes he has left us, we shall find illustrations of rational and appreciative treatment of architecture as an accessory of fiction.

ST. HELEN'S CHURCH, BISHOPSGATE.

On the 29th of February the Lord Mayor, attending in state, unveiled a Shakespeare memorial window in the Nuns' Aisle at St. Helen's, Bishopsgate. The Rev. Dr. Cox, vicar in charge, has good reason to claim one William Shakespeare as a parishioner. The name appears in an assessment-roll dated October 1, 1598, which the late Rev. W. J. Hunter found amongst the Dissolution archives in the old Carlton Ride Record office. One would be only too glad to feel sure that upon the poet this assessment at 5*l.*, with a rate of 13*s.* 4*d.*, was made. But the St. Helen's vestry records which cover the period of Shakespeare's stay in London are unluckily lost. Though we know of him as actually acting at the Bull Inn, Bishopsgate, we cannot point with certainty to any of his domiciles in London before his sojourn at Blackfriars. Shakespeare devised his house there to his daughter, Susannah Hall. Nevertheless there is pleasure in chronicling that in our utilitarian age a private individual comes forward, and, with so spontaneous and graceful a gift, seeks to commemorate the poet's name without disclosure of his own.

Nor, indeed, is the place unworthy of the deed. To a church which contains the tombs of a Crosby and a Gresham, a Pickering and a Julius Cesar, we would scarcely deny the somewhat fanciful style of the civic West Minister. In the fourth century of the Christian era the son of Constantius Chlorus, professedly inspired by the *iv rolyr vika* that shone forth resplendent from the visionary cross, overthrew the heathen temples of Byzantium, and consecrating the new city to the Virgin, set up the Roman Government in the Eastern capital of Licinius. Ere this his mother Helena, born in our own island, with a devotion which won for her the titles of

Piissima and *Venerabilis Augusta*, had undertaken a then unwonted pilgrimage to Jerusalem. Claiming to have discovered the true cross, she built a church over the Holy Sepulchre. It was fitting that her name should be bestowed upon a foundation which arose, and it is believed over a Roman building, during the struggles for possession of the grave which she had sought, and finding, had protected. There are who say, on what authority we know not, that the body of St. Edmund, the martyr-king, was deposited here for a while pending the ravages of the Danes in East Anglia. However this may be, we can more confidently reckon the church's establishment from the middle of the twelfth century. In 1180 Ranulph and his son Robert granted it to the canons of St. Paul's. Early in the century following the Convent of Nuns Benedictine was dedicated to St. Helen and the Holy Cross.* Augmented by another William de Basinge, sheriff (1308), the convent's annual income at the Dissolution amounted, says Speed, to 376*l.* 6*s.*, or about 10,000*l.* at this day. Of the once extensive buildings, the Nuns' Hall, with its crypt below, long used by the Leather-sellers' Company, existed until 1799, when most of the site was covered by St. Helen's place. According to a plan taken after the general repairs of 1808, the two aisles, with two chapels (one of these latter then serving as a vestry), stand nearly north-west by south-east; the wider aisle, or Nuns' Aisle, at a higher level, being to the north-east; and beyond this the former Nuns' Hall and the other priory buildings. A feeble western tower and a Jacobean porch to the south by no means improve the plain exterior. The Gothic and irregular interior,—a survival of the fire,—has been restored by Inigo Jones (see the inscription over the southern door), and twice within the last eighty years. No other City parish church can compete with its magnificent collection of monuments, brasses, and tombs, their beauty and interest enhanced by the arrangement of many upon the floor. Some come from the neighbouring church of St. Martin Outwich,—at the corner of Thread-needle and Bishopsgate streets,—which was destroyed some ten years since. The two western bays, forming what is termed "the Void," were reserved for services at interments. The oldest tombs in this division are those of William Kerwin, freemason (1594), and Magdalen, his wife (1592),—an altar tomb, bearing incised figures; T. Benolt (1534); R. Cotabrook (1393), and Dame Abigail Lawrence (1682). In the Crace collection are two views of Sir John Lawrence's house, built 1646, in Great St. Helen's; in the church chancel, against a pillar, is a pretty carving of his armorial bearings, which marked his seat as lord mayor, 1665. On the "Void" northern wall is a singular monument to John Robinson, an alderman (1592), and his wife, Christiana (1599), who were happy in the nine sons and seven daughters that kneel on a field-stool behind them. Close by is the canopy in Parbeck marble (from St. Martin's), above the tomb of Alderman Hugh Pemberton and his wife Katerina (1500). In the smaller or southern aisle are the graves of J. Leuenhorpe, a brass (1510), F. Nottingham (1530), and many others which we need not particularise. The church is rich in brasses; those of Nicholas Wootton (1482) and John Brent (1451), rectors of St. Martin's, are from that church. Weever mentions the burial here of Henry Gloucester, and Stow that of Thomas Langton, both in 1350; but the most ancient existing monument would seem to be that bearing the recumbent figures in alabaster of Sir John Crosby and Agnes his wife. These effigies are of much interest: the one for the lady's remarkable head-dress, the other for the alderman's gown over plate armour, with a collar of suns and roses,—a Yorkist badge,—around the neck. It were almost unnecessary to say that Sir John Crosby, grocer and woolman, built Crosby Place or Hall, in 1466, on a lease from Alice Ashfield, prioress of St. Helen's, at 11*l.* 6*s.* 8*d.* yearly. He died in 1475, when his widow sold the hall to Richard, Duke of Gloucester. It is frequently mentioned by Shakespeare in his play of "Richard III." Crosby Hall was subsequently occupied by Sir John Spencer, whose daughter Elizabeth eloped with William, first Earl of Northampton, from Canonbury Manor-house (1593). The Spencer monument, placed by

* This foundation is assigned to William, son of William the King's goldsmith, alias William de Basinge, dean of St. Paul's.

Lord Northampton in St. Helen's, carries recumbent figures of Sir John and his wife Alicia, together with one of their daughter, the great heiress, wearing an immense hoop, kneeling by their feet in penitence for her disobedience. The Crosby tomb stands to the south of the altar; to the north are the tablet of Sir Andrew Judd, Skinner (1558), and the tomb of Sir William Pickering and his son beneath a lofty marble canopy of two enriched arches on paired columns. Pickering was one of the chiefest gentlemen in his day, whether for learning, arts, or warfare, whilst his personal beauty and excellence in the *leniores virtutes* of life are reputed to have softened one who refused her royal hand to the kings of Sweden and of Spain. Sir Andrew Judd's benefactions to the City and Tunbridge, in the shape of almshouses and a school, compare not inappily with the similar endowments of his fellow-citizen, the "Royal Merchant," founder of Gresham College, some almshouses, and the Exchange. In the north-eastern corner of the church stands a large sculptured altar-tomb, on whose marble slab was long afterwards inscribed, "Sir Thomas Gresham, knight, bury^d Decem^r 15th, 1579." Above hangs his helmet carried at his funeral. In a spirit different from Bancroft's, he meant, Stow tells us, to build a new steeple, "in recompense of ground filled up with his monument." Near, on the northern wall, will be seen a curious memorial to Martin Bond, train-band captain, governor of Tilbury Fort temp. Elizabeth. He sits in his tent, outside of which stand two sentries, whilst his servant brings up his horse. Adjoining is the monument of his father, William Bond (1576), "Flos Mercatorum," a merchant adventurer rivaling his neighbour, Sir Paul Pindar, and most famous in his age for great enterprises by sea and land. Passing the Nuns' seats, now removed into the chancel, we come to the ugly entrance to the vault which Francis Bancroft erected (1723) during his life-time. He gave his generally considered ill-gotten gains to the maintenance of this and the almshouses in Mile End-road. Left in trust to the Drapers, each newly-erected master of that Company was expected to visit the vault and inspect the embalmed remains within. Another fantastic monument is that of Sir Julius Caesar, Isaac Walton's "charitable Sir Julius Caesar," of Italian parentage, who filled many high offices in the reign of Queen Elizabeth and her successor. As Chancellor of the Exchequer and Master of the Rolls his legal pursuits are exemplified in the white marble scroll in counterfeits of a sealed deed-poll, whereby Julius Adelmare (his father's name), alias Caesar, covenants to pay the debt of nature whenever it shall so please the Almighty. The table is a fine piece of work by Nicholas Stone, for which he received 110*l.*; its plinth lies several inches below the modern pavement. The monument was fixed in the chapel of the Holy Ghost on the 27th of February, 1635. Caesar was buried near the altar on the 18th of April the next year. In 1877 a tablet was set up against the northern wall, by the so-called Nuns' Grating, in memory of Alberico Gentili, an exile for conscience's sake to our shores in the sixteenth century, and author of the great work "De Jure Belli." The register records the burial of his father Matteo "near the cherry-tree," and of the son "at the feet of Widow Coombs, near the gooseberry-tree," in the Convent garden which lay between the church and the western side of the Hall. Nor should we pass unnoticed the monument, removed from St. Martin's, of Alderman Richard Staper (1598), ferryrunner of the Turkey and East Indian trades; on the other hand, Robert Hooke, whose inventions and research play so leading a part in the earlier transactions of the Royal Society, rests here in a grave unmarked. For a memorial of St. Helena herself we are told to look in the Chapel of the Virgin, at a small figure on a bracket, in good old Italian workmanship, of a young woman with a book on her knee. The portion assigned to the convent inmates was screened from the body of the church. The oblique apertures (or squints) in the northern wall gave a view of the high altar from chambers, on two floors, in the convent without. One set of these, to the east, supposed to have been reserved for refractory nuns, is covered with a canopied altar of stone. The calm and repose of this old-world corner are in unison with the antique aspect of the

houses which stand southwards of the church. These retain, both within and without, many fine early Jacobean features. Of Sir John Lawrence's we have already spoken. Adjoining is No. 10, which claims to be one of the oldest private residences in the City,—a reputed home, in fact, of Sir Thomas, father of Anne, Boleyn. During some recent alterations were found behind the wainscot a number of Elizabethan coins, together with some very curious quack advertisements of the period. In Mr. Rolfe's office here are two fine bits of German wood-carving. They are the two heads of a large cask that held a present of Rhenish wine made to King George III. when Prince of Wales.

IN THE MERSEY TUNNEL.

THE driving of tunnels under rivers is not yet so ordinary and every-day a practice but that some interest may be felt in a few words about the aspect which the work presents in operation. As to the general scheme of the Mersey Tunnel, we gave some particulars last year (see *Builder*, Sept. 29, 1883). The work is now in a fair way for rapid completion.

In order to see the actual process of tunnel-making, "first catch your hare"—i.e., first get permission, not to be given without shewing cause,—as the curiosity to see the place has developed to an extent rather inconvenient. Having taken this preliminary step, proceed to the yard, and invest yourself in various defences against wet from over head and under foot, and follow your guide, who will probably be one of the intelligent and civil overseers, into the "cage," which forms at present the only means of communication between the upper and under world. Dropping rapidly down the shaft for 100 ft. or so, we find ourselves in a very damp and dripping cave, opening into the tunnel. This is near the Birkenhead end, and not far from the river-bank, or rather from the dock wall which now takes the place of the bank. But the tunnel extends far inland from this point, having a long gradient to reach the surface. The gradient is 1 in 30 either way, a short space in the centre being level. A very considerable portion either way is fully excavated, and presents the aspect of a long

the interior of a monster gun-barrel. Progress, somewhat difficult, through this portion, led to another fully-excavated length, and thence to the centre level portion of the tunnel, which, again, was at that time only the seven-foot-bore, and this, being filled with water up to the middle, and no tram-line having been as yet laid on the staging, it could not be penetrated without more sacrifice than the object was worth; so we contented ourselves with the reflection that we were, at least, very nearly under the middle of the Mersey, and had 30 ft. of river-bed and 90 ft. of water over our heads; not to speak of shipping, which may be regarded as thrown in.

The section of the tunnel, as complete, is a horse-shoe brick arch of 13 ft. radius, in some portions with the solid rock (which varies in hardness) as a skewback, in other cases with built skewbacks intervening between the crown arch and the invert arch which forms, constructively, the bottom of the tunnel. The finished surface of the rails will be about 4 ft. above the channel of the invert, the tunnel being 23 ft. in height between brickwork, and 19 ft. from the rail level to the crown. In the portions under the river the arches are built with three rings of blue Staffordshire brick and three of red brick; in the land portions two rings of each have been thought sufficient. With the brickwork complete, and with channels at the back of it to carry off the water of percolation, the tunnel seems likely to be as dry as it is necessary for a tunnel to be. In the earlier stages water has been the difficulty, and so far as we could gather, the only difficulty. The stuff to be cut through, sandstone rock, was all of the same nature, and nearly homogeneous in character; and, in fact, if the demand had been made, there seems no reason why the operation should not have been carried out years ago. But the influx of water during the earlier stages of the work was a serious temporary difficulty, and necessitated constant pumping. The following rough diagrams will assist in showing the principal means that were taken to meet this difficulty. The first operation of all, before commencing the actual tunnel for traffic, was to sink the shafts and to bore the water drain below the tunnel and with a reverse gradient. This is shown by the black line (A B) in fig. 1,

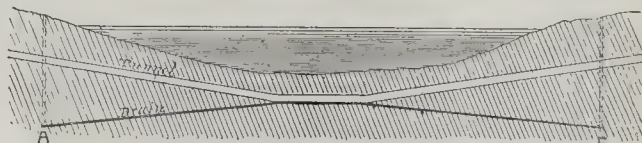


Fig. 1.

continuous cave or grotto, dimly and uncertainly lighted, very muddy under-foot, with rivulets of water running down it, and in certain places a considerable drip from the roof. Along the middle a tramway is laid, and here and there our light reveals a horse dragging trucks along the tram, or waiting till he is wanted for another load. The horses employed in the work have lived down in the tunnel ever since it was commenced, having their stables built up in one part of the excavation; and they seem none the worse for this continued existence in damp and semi-darkness. The greater part of the wholly excavated portion of the tunnel has its brick invert already laid; the top is still in many places in the rough, and in these portions it is that the water still comes in, though not in a more concentrated form than would make a lodging-house shower-bath, and that only in parts. The overseer tells us that they always know when it is high tide in the river above by the additional influx of water; whence it is concluded that the water comes in, not vertically, but through faults on the banks of the river, possibly arising partly from disturbance of the ground in building the dock walls and quays.

Having walked up to the furthest excavated portion on the Birkenhead side, at which point work is in full swing, we retrace our steps towards mid-channel, passing the entrance-shaft, and arriving presently at a part of the work in which, at the time these notes were made (a few weeks back), the passage has as yet only been cleared by the Beaumont excavator, which leaves a circular funnel, 7 ft. in diameter, as round and smooth as if it were

where it will be seen that the drain is coincident with the tunnel-level in the centre, and falls shorewards each way, by a gradient of 1 in 900 in the centre portion, and 1 in 500 for the rest. All water which may collect in the traffic tunnel, after falling to the centre runs into the drain below, and is carried back again to the shore and pumped up to the sewer level. After this drain was made, the Beaumont excavator made the first piercing for the traffic tunnel, and then came the work of excavating from the 7-ft. bore thus formed, to the full height of the tunnel. Here the water necessitated a special course; instead of cutting in the first instance to the intended gradient of the tunnel, each length of work was excavated upwards as shown

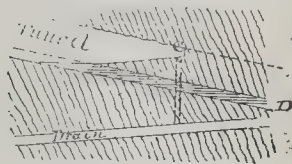


Fig. 2.

in fig. 2, and at the highest point of the excavation (C) a vertical shaft was sunk into the main drain. Thus the water which collected at the end of the workings lay in the angle below where the men were employed, and in the seven-foot heading D, and as the stuff was cut down the drain shaft at C carried off the water. The work of excavation is carried on

partly by the pick, mainly by blasting. The sound of the blast-firing produces a remarkable prolonged echo, reverberating along the tunnel with a very weird effect.

As a mere means of crossing the river, it may well be doubted whether the tunnel under the Mersey would have been worth the cost. But it will assuredly not remain such only. Whatever may or may not be definitely settled at present, it is certain that its ultimate use will be to connect the large systems of railways on both sides of the Mersey; and in this respect it may be said, as we have elsewhere observed about the proposed Parks tunnel in London, that its real public utility depends upon its connexion with main systems. The promoters are, we believe, quite alive to this fact, and predict that, under such circumstances, the new tunnel may look to a traffic comparable to that of the Metropolitan underground railways, with which, as they observe, it may be compared in its circumstances and objects.

MR. POYNTER, R.A., ON EGYPTIAN SCULPTURE.*

I HAVE now described to you in a somewhat discursive manner the art of the Old Empire. One is tempted to say that here is a beginning so brilliant that it might have expanded and bloomed into an art second to none. It is in remarkable contrast to the beginnings of Greek art. A little more freedom, a little more courage in departing from the beaten track, and it might have developed into what it was reserved for the Greeks to accomplish. But for some unexplained reason, the enervating climate perhaps, perhaps a certain sedateness and timidity in the race which made them fear to break through precedent, perhaps the despotism of a vast hierarchy of priests jealous of independent influences which might clash with their own; or, again, because of the obduracy of the materials which came into use in the desire for eternal durability; or again, maybe, from the collapse of the dynasties at the moment that expansion might have taken place,—for any or all of these reasons there is a check on development. The art stiffens into a rigidly-imposed and monotonous conventionalism, which is, however, saved from being uninteresting, as Indian sculpture is uninteresting, by a sentiment of beauty which makes up for the want of fresh inspirations from nature, and by a grandeur of conception and what one may term an awful dignity of treatment, which is not wholly due to colossal scale, but which is to be found in all the works of the best Theban period. With the rise of the Theban dynasties and their powerful monarchs, who, beginning with the great Osirtesen in the twelfth dynasty, and ending with Rameses III. in the twentieth, extended their conquests southward into Ethiopia, eastward over Asia as far as Assyria, and are said to have penetrated through Asia Minor into Thrace, and whose ships brought treasures from far distant countries,—in those times the monarch was a greater object of glorification than ever. In the Old Empire his great work was generally the Pyramid, which he built for himself. The magnificence of his own tomb was the great object of his solicitude during his life. In the New Empire he did not neglect this duty: witness the vast extent of the rock tombs in the Valley of the Kings near Thebes; but his great works were stupendous temples erected to the gods, whose courts he filled with colossal statues of himself, whose walls he covered literally with acres of bas-relief, recording his own acts and his thank-offerings to the gods, and whose approaches were avenues of sphinxes, emblematic of his own power. Sculpture then became more typical, and, in some cases, of a very high order of ideal. It will be well to mention here that there was an interruption in the Theban dynasties, due to the invasion of the Hyksos, or foreign conquerors, at the end of the twelfth dynasty, when there was an interregnum which is a great stumbling-block to Egyptologists, but of which the history seems to be gradually coming to light, and which is supposed to have lasted about 500 years. This is immaterial; but Egyptian history in any case resumes with the eighteenth dynasty or New Empire, and the twelfth Dynasty is consequently called the Middle Empire. Works of this Middle Empire are

rare, but from some remarks made by M. de Rougé we may judge that the sculpture of that time retained the characteristics of the Memphian dynasties in the close imitation of nature, and combined with it some of the typical character which is more appropriate to monumental works, and which seems to have been initiated for more important works as early as the fourth dynasty; witness a statue of Kephren the builder of the second Pyramid, executed in hard diorite in the sitting pose so well known to us; perhaps the first statue of this type, afterwards so universally adopted, which was made. M. de Rougé mentions, of the Middle Empire, a colossal leg of black granite in the Museum at Berlin, which belonged to a seated statue of Osirtesen, as "furnishing sufficient proof that this school was on a more promising track than that of the New Empire." This praise is, I think, borne out by the few works of that time which are in the British Museum. Some small seated figures, though somewhat rough in execution and stunted in proportion, show a remarkable treatment of the torso. As far as I know, they are the only instances in Egyptian art where the thorax has its proper fulness, and where the square markings indicating the leading anatomical divisions are shown. The character here has something of the massiveness of treatment of archaic Greek art. Later, as I have said, we still find a high standard of ideal. Though the limbs and extremities are incorrect in modelling, and with a less true appreciation of natural forms than in the art of the old empire, we find a noble sense of proportion and great simplicity of treatment. The attitudes are dignified, and with the ease that comes from the air of eternal repose which the Egyptians aimed at in the statues of their kings, but the arms and legs are stiff, the hands without expression and rigidly confined to two positions, open and flat on the knees, or grasping a flower or staff with the fingers closed; the knee-joint is misunderstood, the feet poor, and the torso flaccid, with the folds of the skin marked in preference to the anatomical forms; the anatomical sentiment which I have pointed out in the early figure of Nefer, the architect, has disappeared. These qualities and defects are well marked in the noble sitting statues of Amunoph III., of black sienite, in the British Museum, where the merits and faults of the Egyptian style are combined. Except that the thighs are short, the figure is well proportioned, but there is the evidence rather of manufacture by rule than of feeling in the limbs and torso, which we find generally in the Theban art; the meaning of the square markings in the knee, for instance, which in earlier work is done with intelligence, and is a simplified rendering of the true form, is forgotten, and has deteriorated into an equally divided oblong prominence without the sentiment of nature. But this is not always the case. In the colossal arm from a statue of Thothmes III. in red granite, an earlier king of this same eighteenth dynasty, which is at the end of the Egyptian Gallery in the British Museum, near the head from the same statue, we see the anatomical forms well expressed, I may almost say understood, and there is much simpleness of form in spite of the excessively hard material; and I am disposed to think that if we had more extensive remains of this period we should find an art more directly inspired by nature,—in the details, that is to say, of the body and limbs. The attitudes never vary. Thus the standard of ideal may be said to be a high one, but always within certain limits. It is a fixed standard; that is to say, it varies in excellence, but it never varies in character, or so seldom that it never has a chance of expansion. The reason I have already hinted at, the hardness of the materials which came into use, added to the colossal size which prevailed, effectually put a stop to that free treatment which allowed the sculptor in smaller works and in softer materials to mark them with the stamp of his own individuality. The colossal scale on so many of these statues are executed is so familiar to you that two or three instances will suffice. The well-known sitting statues of Amunoph III., in hard red sandstone on the plains of Thebes, are 69 ft. high, and in an inscription on the statue of the great official who had charge of the making of these statues, and which is in the museum at Boulak, he tells us that eight ships were built for their transport. "Their landing in Thebes," he says, "was a joyful event." The fist of red granite, which you see in the British Museum,

belonged to a statue of Rameses II., which would be 70 ft. high if standing, but this sinks into insignificance by the side of the broken granite statue of the same king in the Ramessium at Thebes, which measures 22 ft. across the shoulders, and which, according to tradition, was laboriously and wantonly thrown down by Cambyse in a fit of destructive fury, and remains in fragments on the spot to this day. Now when we consider the enormous amount of this colossal work which was produced during the eighteenth and nineteenth dynasties, in materials so hard that no one can guess how they were worked without steel tools, it becomes obvious that it must have been entrusted to armies of artisans, who could work only by rule under the superintendence of a master, and without inspiration from nature. Accordingly we see representations in reliefs of the process of executing these statues, where the colossi are surrounded by scaffolding covered with workmen occupied on different parts at the same time; we even see in a painting which shows the process of carving two statues that, although they are only life-sized, two artists are at work on each of them, one at the back and the other at the front; and in an inscription on the tomb of a sculptor named Bek under Amunoph IV. he is called "an artist and teacher of the king, an overseer of the sculptors," and there are various other inscriptions to the same effect, with which I need not trouble you; but all this supports what is sufficiently obvious, that the sculptor was an overseer of workmen, who must have been employed in such vast numbers that they could have had no artistic feeling, but must have worked by definite rules; which, however, must have had their good as well as their bad side, since the Egyptian statues preserved, through the 350 years from Aahmes to Rameses II., that imposing majesty of style, combined with the utmost finish of execution, which strikes the beholder with wonder, reverence, and something like awe. Over-production, however, under Rameses II., carried out in this mechanical manner, finally did its work, and during his long reign of sixty-seven years Egyptian sculpture deteriorated in style with great rapidity. In the twenty-sixth dynasty, 600 years later, under the Saite kings, there is a revival in imitation of the art of earlier times, combined with excessively high finish, in which Greek influence has been recognised, the Greeks having at that time a permanent settlement in the western part of the Delta. There are works of this period in the British Museum, but the finest are, I believe, in the Vatican. They show no change in style. In the next century, in the year 527 before the Christian era, came the conquest of Cambyse, who overran Egypt like a furious maniac, and wrought especial destruction at Thebes, which had long ceased to be the seat of the monarchy, and had become a city of antiquities, and the last traces of originality in native art now disappear.

I had originally proposed to myself to touch slightly on the history of Egyptian sculpture, with reference to such influence as it may have had on early Greek art; but the subject is an interesting one in itself, not easy to pass over in a few words, and my own inclinations have always led me towards this study; but the subject is also an important one, as putting before us in a very simple light one of the problems with which a sculptor has to deal. Egyptian sculpture contains, as Flaxman said, "some excellent first principles of art," and on this point I propose to detain you a little longer, as the very regularity and simplicity of treatment in Egyptian art may better enable us to make an application of these principles to practice. I will take into consideration the works only of the New Empire, as it is then that the art becomes typical in form and develops the limited principles by which it is guided; and there is no doubt that we find in these works both grandeur and beauty, and that broad general treatment of form which, while it eliminates detail, gives the leading characteristics, which is the essence of a fine style. The two standing figures of the Goddess Pasht, with the cat's or lioness's head at the end of the Egyptian Gallery on each side of the door, will serve as an illustration of my meaning. The attitude is the normal one; the right hand hangs down by the side, slightly bent across the body, holds a long stem of papyrus plant. They are clothed in the mummy-like dress moulded to every inflexion of the figure, in which the goddesses are always represented, whether in detached figures or

* Continuation of a lecture delivered at the Royal Academy on the 3rd inst. (See p. 339, ante.)

on the reliefs, and which must not be taken to represent the actual appearance of the dress they wore, but which was used by the Egyptian artists to express, by the simplest means they could achieve, the appearance of the body through a thin material; the form is, therefore, typical and symbolic of a dress through which the movements of the figure can be seen. This was no other than the intention of Michelangelo, when he showed the forms of his figures and limbs through drapery, in a way which you may have heard characterised as impossible and untrue to nature, and which was in effect carried to an excess of mannerism, as usual, by his successors and by his imitators in modern German art. His aim was to apply a typical and normal truth to individual instances. What is true of successive moments of time he condensed in one action, and so produced a higher truth than can be found in the model or the lav-figure.

In the treatment of the arms the rounded and graceful lines are the first point that the Egyptian artist has considered, and he has rendered this quality in excess. In one figure the bend of the arm is shown only by a slight flatness in the form; the round point of the elbow is also shown with great delicacy, and the flatness of the arm at the back above the elbow is also expressed, and we have on the whole a fair but very subordinated rendering of the essential features. The bend of the hand in the wrist is also well expressed. In the other the work is more mechanical, and these details are lost to such an extent that except for the indication of the process of the ulna at the wrist the arm appears boneless. But the true feeling is there, which characterises all the best art; that which subordinates detail to gain the first essential characteristics of the female form, grace, roundness, and snavity of line. In this sense Egyptian sculpture is a lesson none the less instructive because of the ignorance of the artist. The feeling for beauty is, no doubt, instinctive; The Egyptian sculptor as naturally invests his work with a well-balanced and beautiful form, as the Assyrian does with the coarse and rugged one. Except in so far as imperfect knowledge of anatomical expression in the limbs and trunk shock the cultivated artistic sense, we find no ugliness in the Egyptian art. Even the monstrous combinations of animals' heads with human bodies under which "fanatic Egypt and her priests" symbolised "their wandering gods disguised in brutish forms," are so skilfully designed and adapted that they do not jar on our sense of propriety, as they do in the hideous monstrosities of the same kind in Indian art. The heads are always superior, and have more individuality than the limbs. The intention to make a portrait is always evident, and in the heads of the three great monarchs which we see in the British Museum,—Thothmes III., Amunoph III., and Rameses II.,—we see unmistakable likenesses. Those of Rameses vary, no doubt; but I have already alluded to the over-production of work in his long reign, which brought about a decline of art; accordingly we find a distinct difference of treatment in the two colossal heads which are in the central part of the Egyptian gallery,—the one, an original of red granite, is in the finest style of art, while the other, which is a cast from a still larger colossus, is decidedly inferior. The one looks like a faithful portrait of Rameses, whose head was of a refined and beautiful type, and is considered to represent what may be called the aristocratic Egyptian countenance, and the resemblance to a beautiful statue at Turin is striking; the other has the appearance of a more mechanical repetition. The fact is that, though Rameses reigned for sixty-seven years, it was etiquette to portray him all through life of the age he had when he came to the throne. We have seen something like this in modern English art. The portraits of Amunoph III., of the previous dynasty, are highly characteristic, and evidently bear a strong resemblance to the original, for they all resemble each other very closely; the somewhat negro-like character, with the flattened nose and projecting lower jaw, producing a hollow form of the cheek from the eye to the thick prominent mouth, is everywhere the same, and the way of insisting on this characteristic trait is a good instance of the typical treatment of form to which I have alluded. The artist has omitted the detail and play of form in the cheek to dwell on this leading point in the character of the face to an extent which is impossible in nature; but there is great grandeur of style in the complete subordi-

nation of minor points to a few leading and broadly-treated characteristics. I may mention here the heads on the Greek coins as carrying to the furthest point this insistence on leading characteristics, to the exclusion of all detail which is not typical. But whereas in Egyptian art the dwelling on some prominent distinctive features tends to what one may call caricature, though of an elevated instead of a debased kind, in these Greek heads the balance is so perfectly kept that there is no one point which we can say is forced upon us more than another. If we admire the hollow which marks the setting of the eye, detaching it with such breadth of treatment from the nose and cheek, we no less admire the largeness and fullness of the forms which prevent this hollow from tending to meagreness. If it is the magnificent simplicity of line of the forehead and nose, which is typical of the Greek profile that strikes us, we are no less impressed with the powerful definition of the prominence of the brow over the nose, and the subtle inflection which marks the tip. We cannot say whether it is the clean cutting of the lips, or the softness of the modelling, which most attracts us. We are baffled, in fact, when we try to seize on any one point which shall teach us the secret of their magnificent style, and we are forced to confess that there is no secret but sheer strength and superiority.

And that this is not a universal way of treating the form of the cheek in Egyptian art is obvious from a glance at the still earlier colossal red granite head of Thothmes at the end of the room; for here the cheeks are full and smiling, and the general characteristic quite different, but equally individual. We see in all these heads, however, that certain conventional rules have been obeyed. There is, for instance, a way of rendering the eye which is common to all these statues. A flat and definitely-marked broad line is carried round the eye, and, meeting at the outer corner, is extended towards the temple, which may sometimes have been painted black. This is not universal, however, and I must here draw your attention to the head of a king, who is generally supposed to be Seti-Meneptah, of the nineteenth dynasty, father of Rameses II., but in whom M. Maspero traces a king of the eighteenth. Here we have a class of work superior, I think, to anything we know of the later school. It is a proof that, after all that has been said, the merit of a work must have depended then, as always, on the individual artist who executed it, and that the movement towards fixed conventionality was not in consequence, as has been supposed, of rules prescribed from without; or, at least, that such rules were not so fixed but that artists of genius could, to a certain extent, free themselves from them. I should have liked to give you an illustration of a beautiful draped statue of Rameses II. at Turin, which is also a departure from the usual form of treatment; but, as it is well engraved in Messrs. Perrot & Chipiez's book, I must refer you to it there. The life-sized granite statue of Rameses II. as a boy, in the British Museum, presents also a peculiarity which I have not elsewhere noticed, in the attempt to render the markings which show the divisions of the lobes of the deltoid muscle. This comparatively small statue is also well worth your attention.

I have now touched on all the most noticeable points in the consideration of Egyptian sculpture, and I have endeavoured to show that that dignified grandeur which we admire is due to a genuine understanding of the true treatment of the human figure in monumental sculpture,—the dwelling on characteristic and beautiful forms to the exclusion of petty and irrelevant detail; we have also seen that they never departed from the two or three typical attitudes which I have mentioned, and which I have no doubt they chose deliberately as the most impressive and the most suggestive of majesty and repose. That this in any case was intentional cannot be doubted, for in the reliefs there is no want of life and variety in the movements. The really sublime action of Rameses II. slaying his enemies from his chariot, in a long relief in one of the upper rooms of the British Museum, cannot but have struck you; no art can show anything more vigorous, more true, or more fully expressive of the action intended. The subject of the bas-reliefs is too long to dwell on now; but I may draw your attention to the fact that you will

frequently discover a very high feeling for composition, harmonious balance of lines, and good disposal of masses; and there are certain groups of the three Theban gods, Amun Ra, Maut, and Chousu, which are truly magnificent in the arrangement of the varied lines of the figures in combination with architectural forms, which we also see in the figure of Rameses seated under his naos in the relief mentioned above. And in processions of figures you will find a foreshadowing of a striking feature in Greek art, unity of movement, and harmonious disposition of the groups, with a happy variety in the groups themselves. The complete compositions are, however, confined; the walls are covered, but with no eye to the general effect; and when crowds are introduced, as in those of enemies falling beneath the sword of the Pharaoh, all is grotesque confusion,—the figures are heaped pell-mell without order or arrangement; partly, perhaps, from a contemptuous feeling that a vanquished enemy deserved no better treatment.

THE PELE-TOWERS OF NORTHUMBERLAND.

OVER and above the grand old castles on the Northumbrian side of the Scottish Border, there are scattered over the district about two hundred towers formerly used as fortified residences by the Northumbrian gentry. These interesting relics are to be seen at the feet of the hills forming the Cheviot range; on the moors; by the coast; as well as along the Border,—in a word, in every part of Northumberland. Many of them are now in ruins; others are in good preservation; and still more numerous examples have been incorporated with more modern additions, and now only form a part of larger mansions. They generally consist of three stories, one above another, and the walls are of great thickness, often measuring 6 ft. The basement chamber is always vaulted with stone groining. Sometimes there is a stone staircase within the tower; but frequently, in the examples now lying in ruins, where there has been only an external stair, this has been removed, and there is no access to the upper portions, except by climbing the crumbling walls. The two upper chambers are generally furnished with stone-arched fireplaces and small mullioned windows; and from the walls project the stone corbels that once carried the beams for the floors.

The pele at Heaforlawe, near Alnwick, is one of the examples now in ruins. When seen from a distance it has the appearance of a solid square of masonry on the ridge of a hill. As it is approached its characteristic features become apparent. It has had three stages, whereof one has been allowed to decay, which has reduced its height to its width, and produced the squarish outline now seen. We have only to climb to the top of the frayed walls to see the wisdom of the choice of site. To the north sweep the undulating lands that are bounded by the Cheviots; to the east lies the great ocean; to the west are the fertile valleys near Whittingham and Rothbury; and southwards stands Alnwick Castle, with which it could easily communicate by signals or beacons. It is built of sandstone now toned down to dove-colour; and the interstices between the stones are tinted with green and orange lichens and tiny tufts of weeds.

The tower at Biddlestone has met with a better fortune. It is in good repair. Many of our readers will remember Sir Walter Scott took Biddlestone Hall as his model for Oswaldston Hall, described in Rob Roy. It stands in a wild heathery country, in the heart of the western moors of the county. We may see that the first residence of the Selbys, to whom this district belongs, was the strong pele now standing. As extra accommodation became requisite additions were made to it, all of which, however, were eventually removed, leaving the pele still intact; and a large modern mansion was erected close by, new from the foundations. The upper portion of the tower thus preserved is now used as a chapel. The vaulted chamber on the ground-floor is utilised as a cellar.

At Fonteland a pele has been treated in a similar manner. Five-and-twenty years ago it formed part of a large house, which has been since taken down, and once more it stands, like a solitary sentinel, erect and vigilant, though scarred and grey. The house in question was used as a vicarage-house; and we may note, it is not at all uncommon to find a tower thus incorporated in a vicarage-house. Embleton.

Vicarage-house has a fine pele attached to it. At Shilbottle, Elsdon, and Alnham are additional examples.

Shilbottle pele, described as "turrus de Schilbottle" in old times, stands within a stone's-throw of the west end of a little Norman church. It is of Plantagenet workmanship, and consists of three stages, whereof the lowest is stone-vaulted. From the top of this little tower, a large tract of country is under surveillance. It would be almost impossible for the smallest body of men to traverse it unobserved by those watching from this height. In the last century a study and a kitchen, with bedrooms over them, were considered indispensable additional accommodation for the vicar of the day, and they were built on one side of the tower. In their turn these additions were eventually considered insufficient to meet the requirements of nineteenth-century life, and a new wing was added on another side; in virtue of which the ancient tower now stands grouped with these modern features, but still distinguishable and picturesque.

Elsdon lower is of much larger dimensions, with thicker walls, and it has a stone spiral staircase still in use. Many additions were made to it by the late Archdeacon Singleton. There are moors spreading around it far and near; and close by, on the village green, is an ancient church, in which the slain in the battle of Otterbourne were buried. On one face of this noble pele is a panel with a coat of arms and initials signifying it was once the residence of the lord of the district, Robertus de Rede. Alnham tower lies in a secluded spot nearer to Biddiestone. It is in good repair, and of considerable interest.

At Beadnell, near the coast, the small inn has been a pele tower. Some outbuildings have been added to it, and the topmost story rebuilt; but there are the massive walls, the low doorways, and the small window openings characteristic of the Plantagenet period in the rest of the building.

The Plantagenet pele in Wallington Hall, the seat of Sir Charles Trevelyan, is an example in which the original fortlet has been preserved from century to century, notwithstanding additions and alterations that have more than quadrupled the original accommodation it afforded. This is in good repair. It overlooks a wide sweep of country.

On one of the groups of islands on which Grace Darling's lighthouse stands, known as the Farnes, there is a fine pele tower, also in good preservation. It is very stalwart and strong, and like the rest, of three stories in height. There is a small chapel on this island, and the tower was, probably, the residence of those who ministered in it or defended it.

At the great archaeological gathering that is to take place in Newcastle-upon-Tyne in the course of the approaching summer, these pele towers, or their sturdy comrades in the adjacent parts of the county, are likely to occupy considerable attention.

THE BUILDING OF TOWN HOUSES.

FITTINGS, PLANNED FURNITURE, AND CONSTRUCTIVE DECORATION.

Mr. R. W. Ellis, F.S.A., delivered the third and last* of his series of Cantor Lectures on this subject in the Hall of the Society of Arts on Monday, the 3rd inst., Mr. B. Francis Cobb in the chair. Mr. Edis said that in the present lecture he proposed to offer to those who were furnishing old, and to those who were building new, houses, some suggestions which might commend themselves as being worthy of adoption as tending to the better ordering, greater comfort, and more artistic homeliness of the rooms we lived in. He held that true art in the house meant the practical rendering, in good taste and pleasant guise, of all the absolute necessities and requirements of modern life. All domestic art which ignored the purposes to which the furniture, decoration, or general belongings of a house were to be put was bad. Comfort, utility, and good taste should go hand-in-hand with the internal finishing of every house. While it often happened that no pains or expense were spared to make houses comfortable and convenient internally, and artistic and beautiful in their external design, it was apparently often forgotten that the true decoration and artistic furnishing of the build-

ing should be considered and thought out as part and portion of the whole fabric; they could not properly be separated, and although, to a certain extent, eclecticism might and would prevail in the smaller items and movable furniture, and in the numerous necessary articles which went to make up the comfort of the various rooms, the general scheme of decoration and fitting-up of a house should form a part of a harmonious whole. Although in the ordinary furniture of our houses we had lately introduced a new order of things, and had made the designer and manufacturer work up to the improved taste of the people, we were still content to look upon the furnishing of our rooms as more or less consisting in the purchasing of various ready-made goods, which could be stored and used for a while and removed as occasion might require. In doing this, we were apt to get furniture and fittings which, like ready-made clothing, were often misfits, and in part only answered the purposes for which they were bought. We were not inclined to consider, with any amount of care, the requirements of the various rooms and to construct our fittings to suit those requirements, so as to make them not only useful and ornamental, but part and portion of the rooms we lived in, in harmony and keeping with the general design, and with due regard to proper sanitation. In fact, we completed our buildings without thought as to their internal fitting-up. By this want of thought there was often much increased expense in the building. For instance, window-recesses, which could be well fitted with box or ottoman seats, answering the double purpose of comfortable resting-places and store-places for papers, clothes, and other household goods, were finished with panelled and moulded wooden backs and skirtings altogether unnecessary. Again, recesses, which naturally suggested themselves as proper places for fitted cupboards, were completed with mouldings and skirtings which had to be removed, or else they increased the expense of fitting by the labour and time involved in "suiting," as it was called, the fitting to the mouldings, which not only were not wanted, but were absolutely in the way. Most people required, nowadays, that there should be some other means of ventilating their rooms beyond merely opening doors or windows, and all this work should be constructed and arranged as part of the furniture and fittings of the house,—i.e., in all newly-built houses, any arrangement for bringing in fresh air behind grates or through tubes should not require the cutting away and making good of the work, which entailed much inconvenience and expense. Such matters as these, and the provision of picture-rails, book-shelves, and shutters that will shut without inconvenient contact with window-blinds and curtains, should all be considered by the architect in the planning of his rooms, many of which could be provided with constructed and useful furniture suited to their various requirements. The provision of such constructed and fixed furniture would not only save money being spent on finishings which would then be unnecessary, but would provide a large amount of the heavy furniture of the house, such as wardrobes, book-cases, buffets, &c., at considerably less cost than the movable articles, and in accord and harmony with the design of the house. Proceeding to enter into details as to the wide room for improvement which exists in the construction and arrangement of sanitary and other fittings, the lecturer showed how small quantities of waste water might be collected and stored for a time so that their discharge in the aggregate might be made to flush the drains of the house in a manner that was not possible when they were discharged in dribbles. It was to be regretted that modern builders were content to ignore to a large extent all modern improvements. We still saw used locks and door and window furniture which were a disgrace to any civilised community; composition handles; trumpery finishings; unwieldy sashes, with no means of lifting them; and box-shutters which were either never shut or which, if they were, necessitated the moving of every piece of furniture in the windows. What could be worse than the wretchedly-constructed decoration, in the shape of plaster cornices and centre-flowers, to be seen in most houses? If ornamental ceilings were wanted, why not dispense with the old-fashioned lath and plaster, and use more extensively fibrous plaster, which could be modelled to any design, and could be screwed on to the

joists? This sort of work was infinitely better than the old system of daubing two or three coats of heavy plaster on to the walls and ceilings, for owing to its strength and tenacity it had no liability to crack, was virtually fireproof, was rapidly fixed, and could be decorated within a few weeks. Both fibrous plaster and paper-maché adapted themselves to the ornamentation of ceiling and walls, and could be successfully applied to many purposes in the building of a house. Leather-papers, "Lincrusta-Walton," glazed talence, and other materials, were also referred to as materials admirably adapted for use in the constructive decoration of houses. In conclusion, the lecturer pointed out that in the best Renaissance houses almost invariably the decoration, furniture, and fittings were designed by the architect, and were made more or less elaborate as the taste and luxury of the age required. If the same system obtained now as it did in the best periods of art we should have better and more satisfactory results in the interiors of our own houses, with no material difference of cost to the client. If the architect were, as he should be, the chief or head-builder, working in association with the sculptor, the painter, and the upholsterer, the art-work of his building would, if he were himself an artist, having delight in his work, speak more surely than any words, and we might then hope for better buildings and for higher art-work.

The Chairman, in proposing a vote of thanks, said he felt sure that the general views enunciated by the lecturer in the three discourses with which he had favoured them had met with the approval of the audience, most of whom, however, could only feel how impossible it was for them to adopt all his suggestions in the houses which they inhabited. Still, he had no doubt that future generations would benefit by the adoption of most of Mr. Edis's suggestions. The Society of Arts would do what was doing its best to improve the habits of the people, as would be seen from the fact that they would this year give prizes for essays on dwellings for the poor, and on the reconstruction of central London.*

The vote of thanks having been carried by acclamation, Mr. Edis briefly acknowledged the compliment.†

DETAILS OF CLOISTERS AT RATISBON.

The Abbey Church of St. Emmeram, situate at the southern extremity of the city of Ratisbon (or Regensburg, as it is locally called) has some remarkably interesting cloisters, forming three sides of a square, of fourteenth-century date. The bay we illustrate from the north walk is the only one here of its kind, the others, without exception, having glazed windows. The effect of the double arcade is exceedingly effective, especially so when taken with the remarkable rose-window which surmounts it. Internally this, as well as the arches below, has a species of chevron worked in the label, the feature being omitted in the exterior.

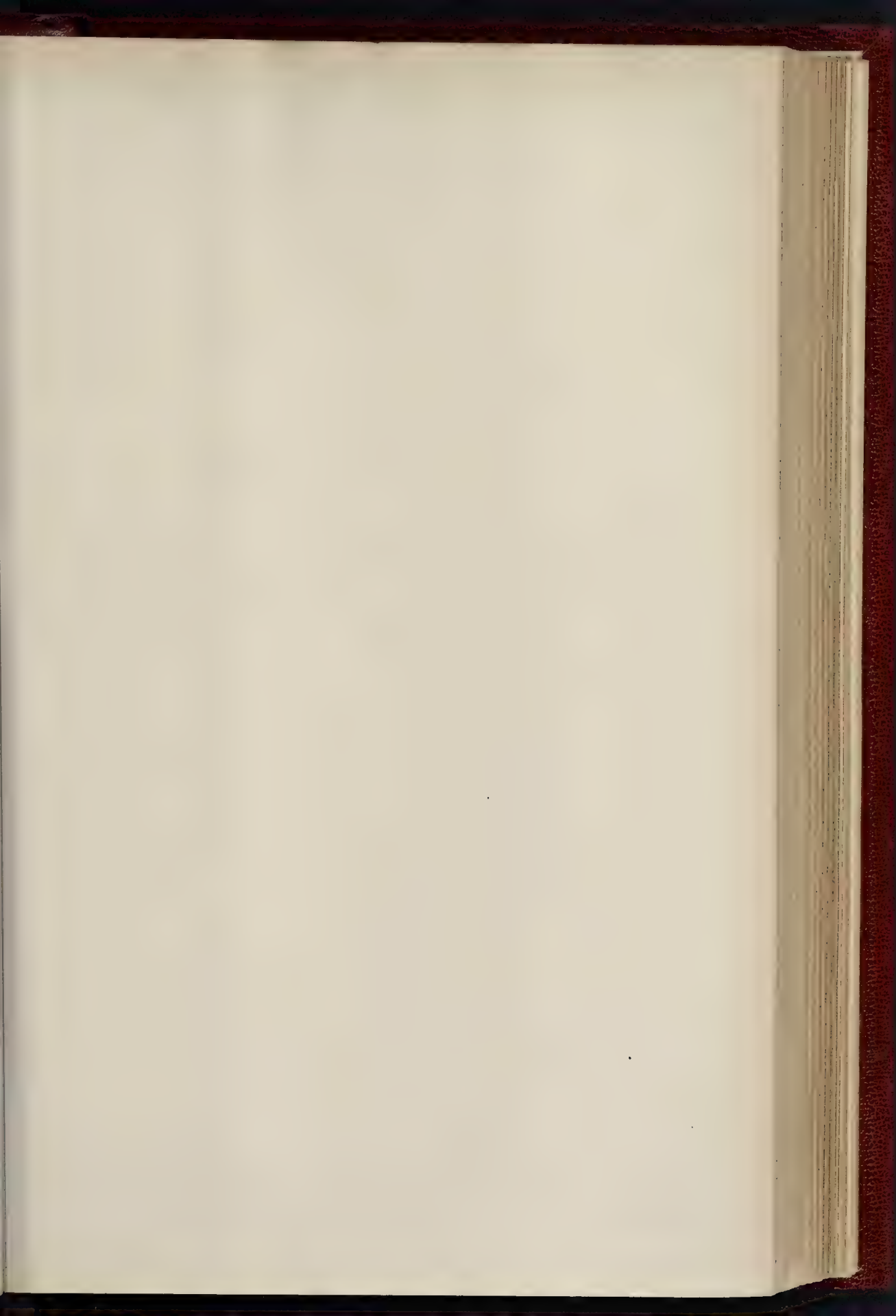
The work has not been carefully set out, the internal arches being much out of radius; a similar instance, it will be remembered, exist in the arcade at the north end of the chapter-house slype to Southwell Minster, Notts. The sculptures are from capitals in the same walk of the cloisters. The whole suffers from whitewash obliterating much evidence of jointing and workmanship. The drawings were plotted to scale on the spot. W. A. P.

The Pepys Memorial.—It has been found necessary to postpone the unveiling of Pepys's monument, at St. Olave's, Hart-street, E.C., from this Friday, the 14th, to Tuesday next, the 18th instant, in consequence of official engagements which will prevent the First Lord of the Admiralty and the United States Minister from attending to-day.

* The Council of the Society have had placed at their disposal by Mr. William Westgarth, a member of the society, a sum of £2000, to be awarded in prizes for essays on the above subjects. The first prize will be a sum of £500, for the best practical essay upon the re-housing of the poorer classes, and especially of the very poorest classes, of the metropolis. The second prize will be a sum of £200, for the best practical essay upon the whole subject of the sanitation, street re-alignment, and reconstruction of the central part of London. Further particulars may be had on application to the secretary.

† Messrs. Thomas Crapper & Co., of Marlborough-road, Chelsea, executed the ventilating arrangements at the new Ball-room at Sandringham, referred to in Mr. Edis's second lecture (see p. 297, ante).

* For summaries of the first and second lectures see *Builder*, p. 291, ante.



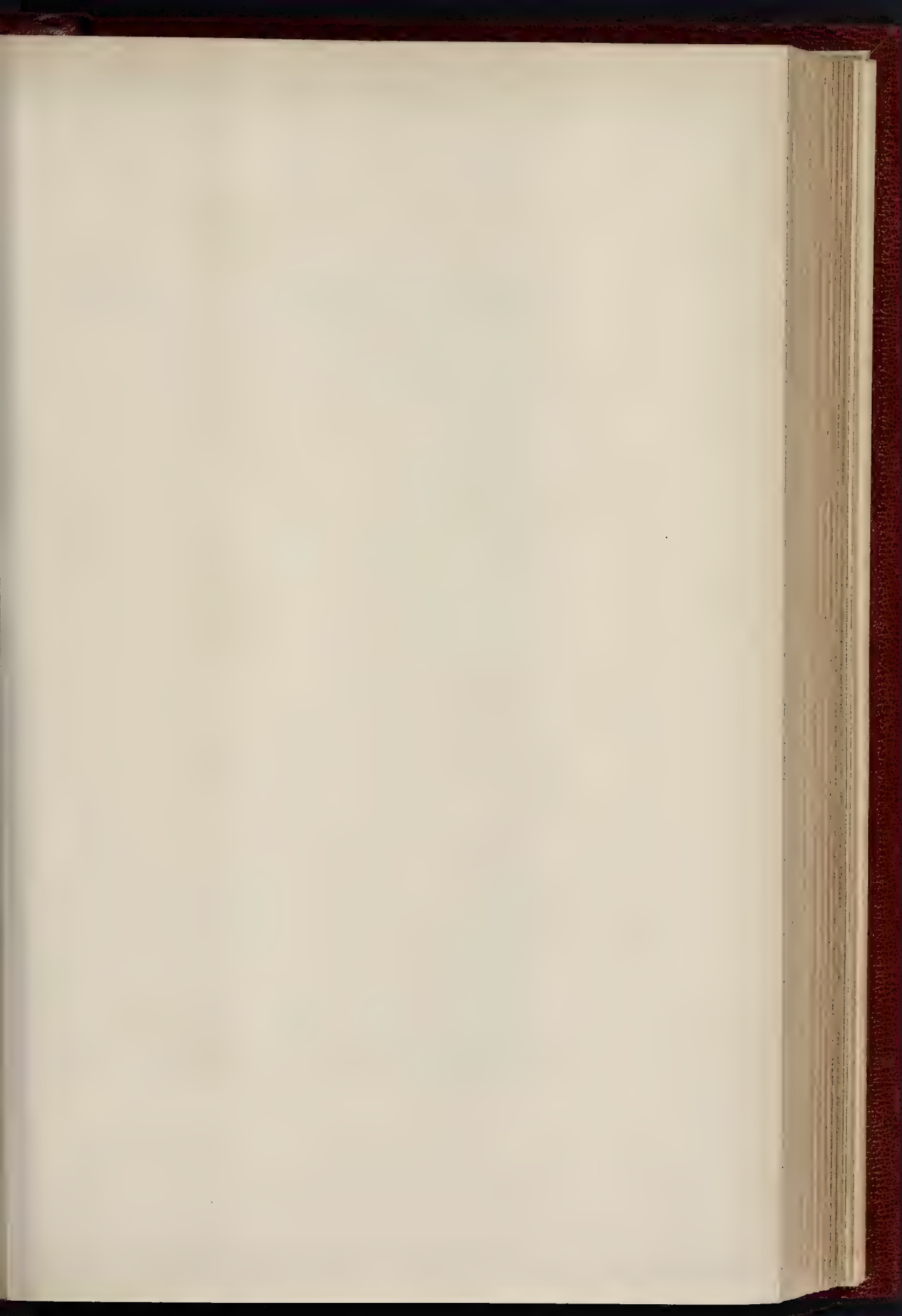


SOANE MEDALLION

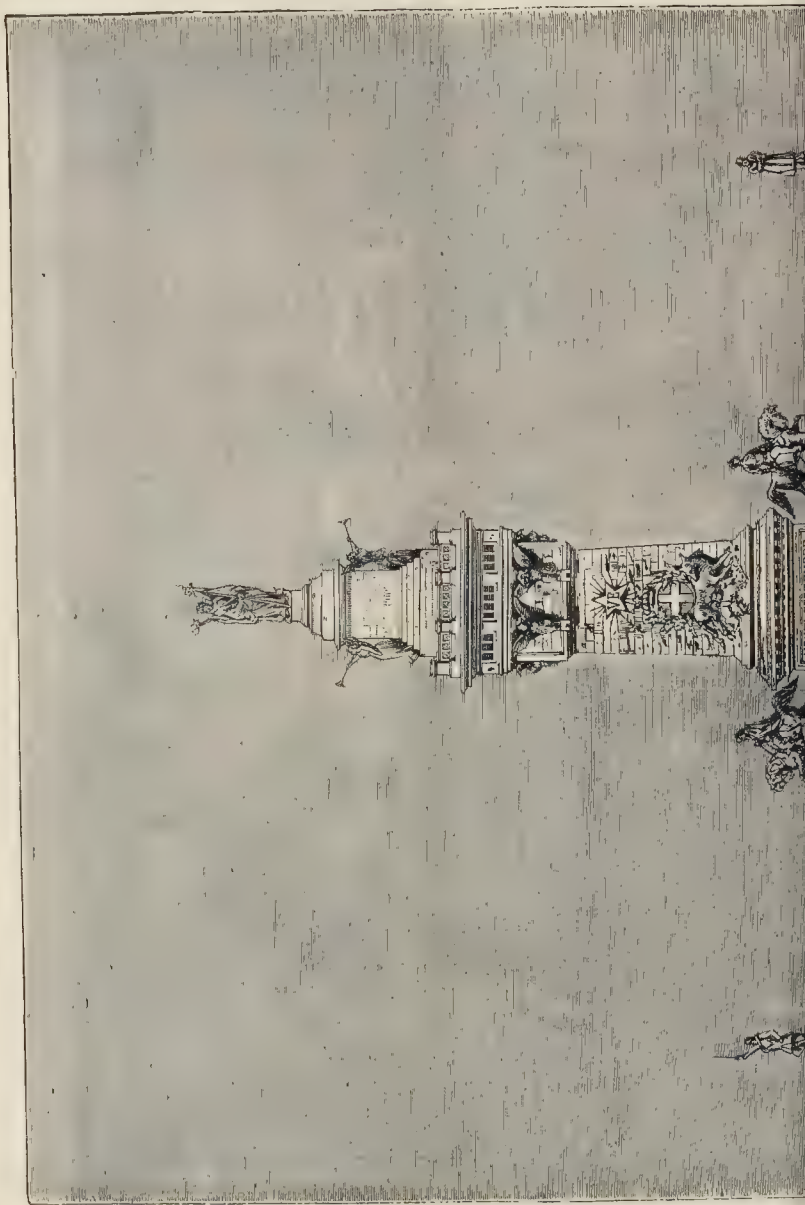
Design for a

THEOLOGICAL COLLEGE





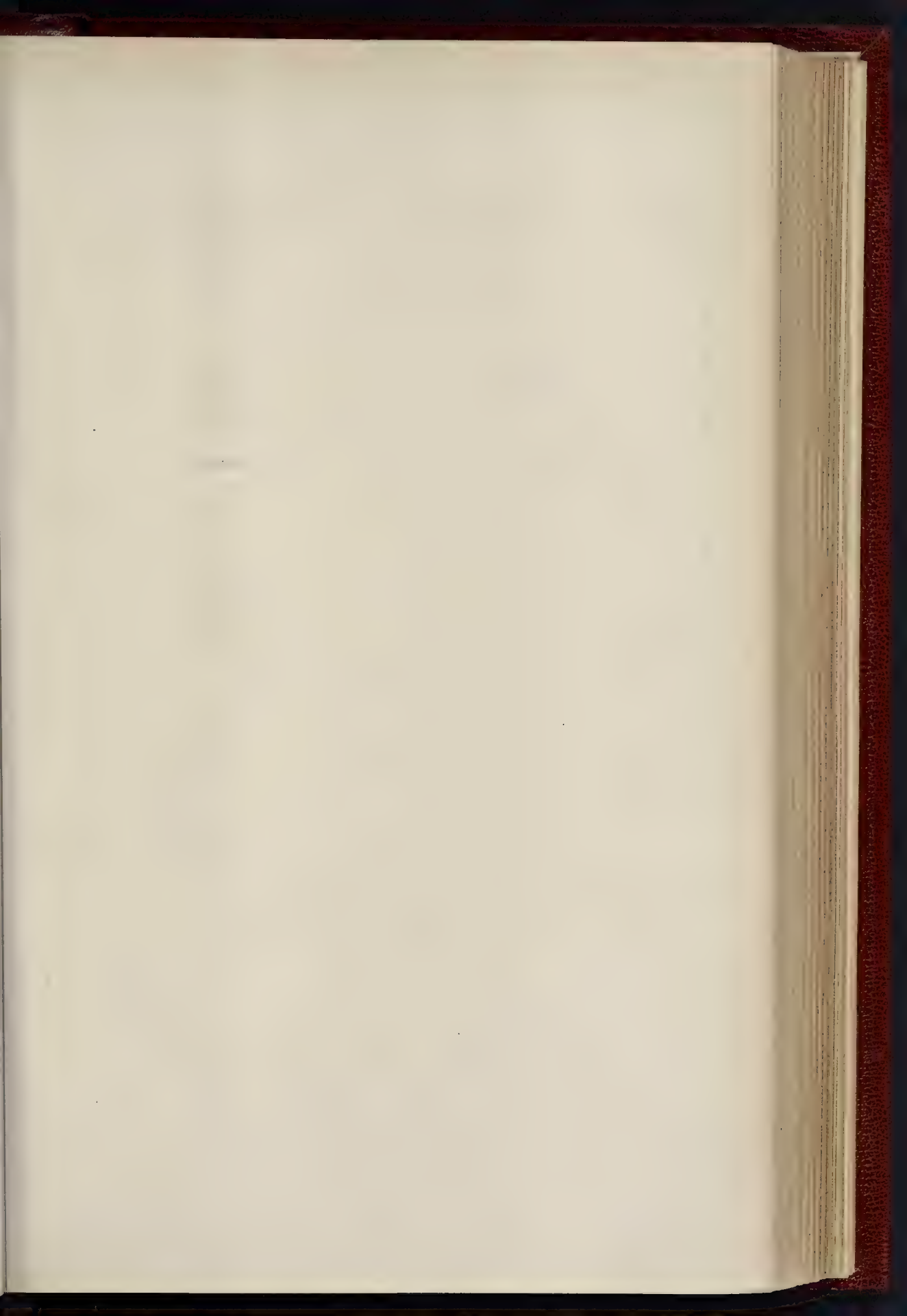
THE BUILDER, MARCH 15, 1884.



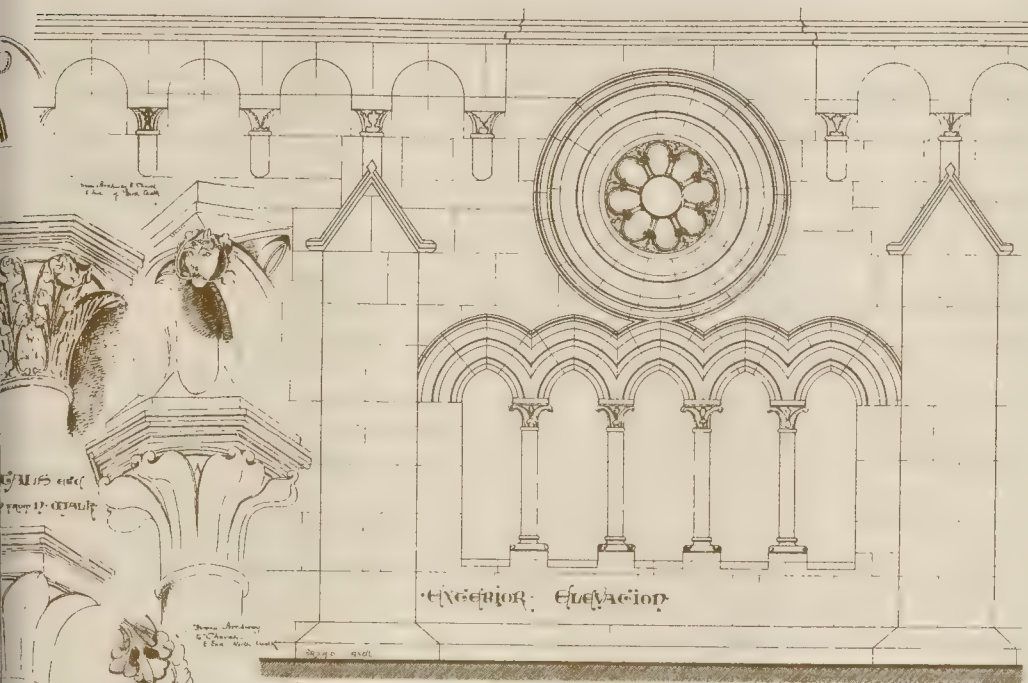


COMPETITION FOR THE MONUMENT TO VICTOR EMANUEL AT ROME.

DESIGN BY SIGNOR LUIGI BOFFI.



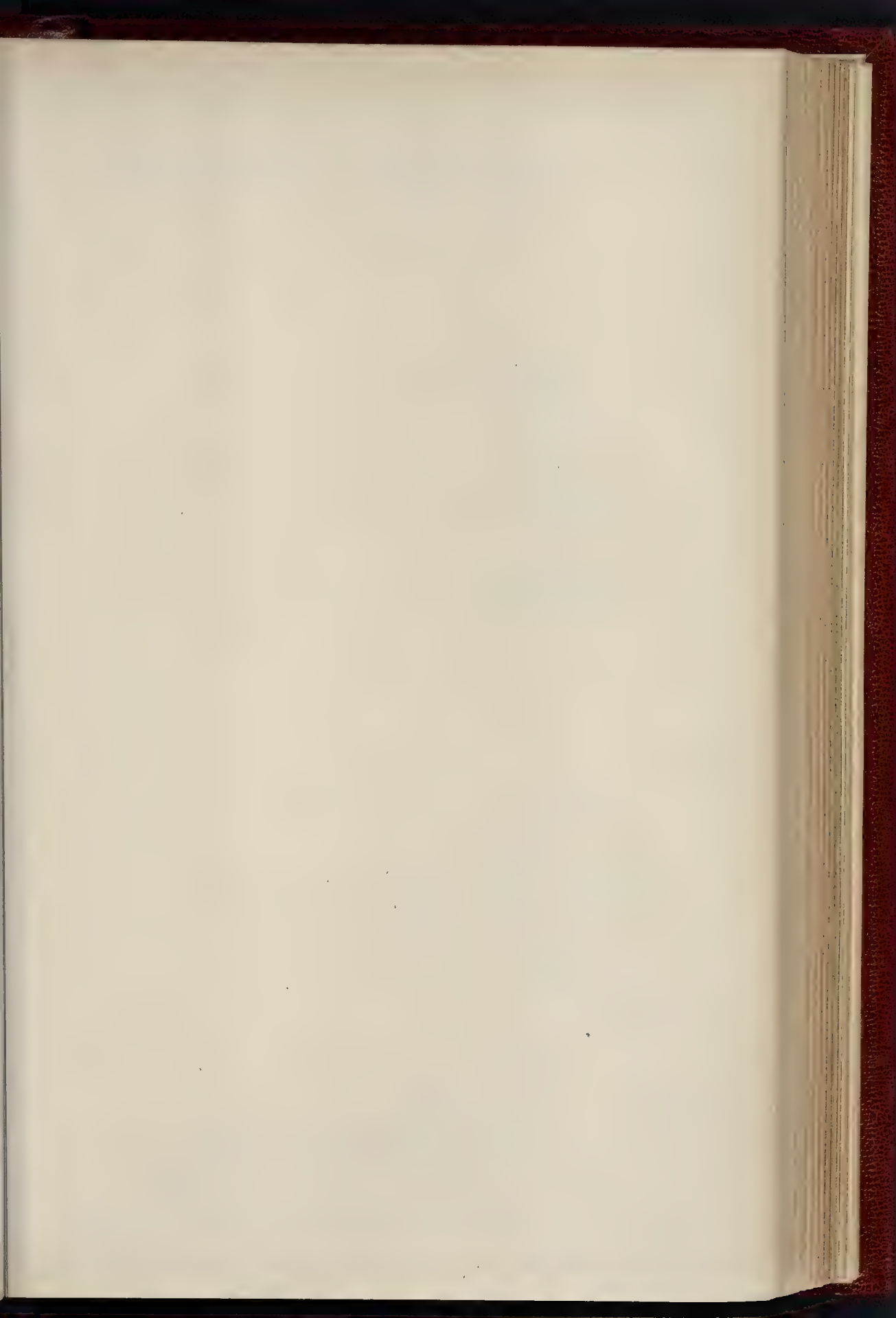




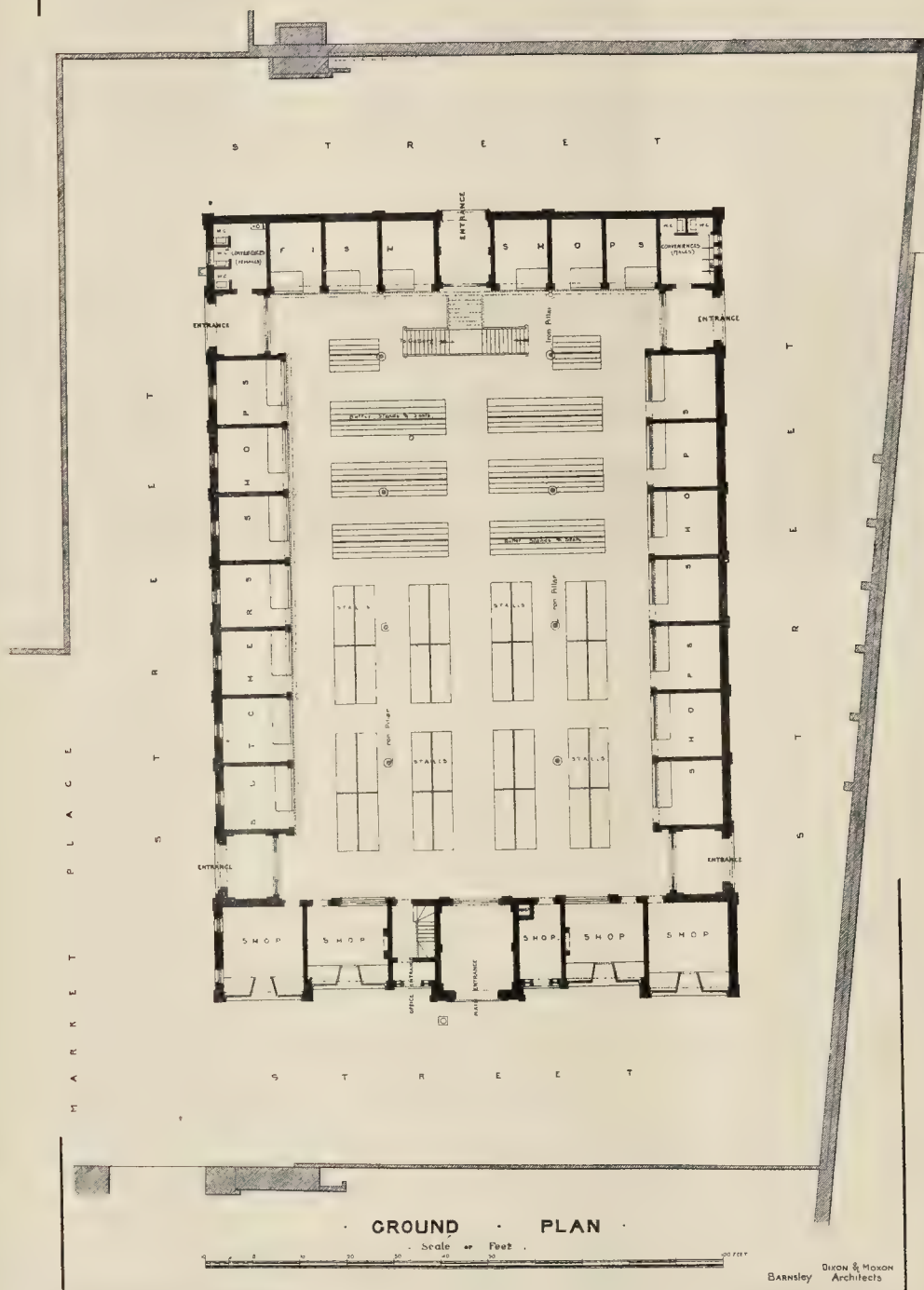
EXTERIOR ELEVATION



INTERIOR SECTION



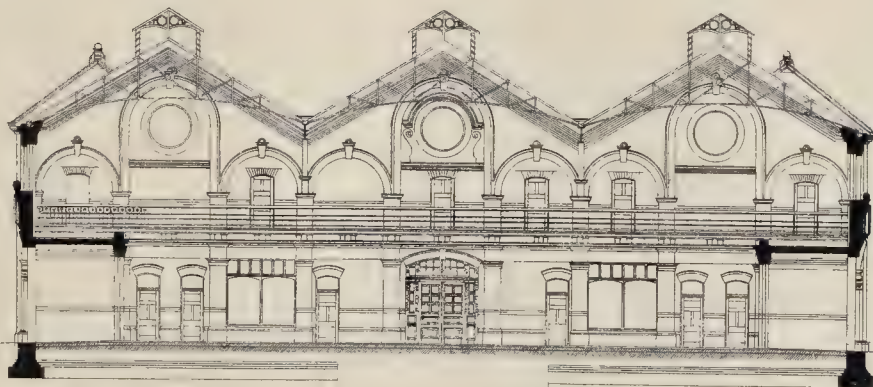
· MARKET · HALL · BURTON ON TRENT ·



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FRONT ELEVATION



TRANSVERSE SECTION LOOKING WEST



NEW MARKET HALL, BURTON-ON-TRENT.

THE above building was opened in October last. It was the subject of a competition some three years ago, and these were the plans selected by the Corporation, on the recommendation of Mr. Evans, of Nottingham. The original intention was to spend about 8,000*l.* on the building, but the first arrangements have been added to in many ways, and the total cost, including all fittings, has been about 14,000*l.*

The market is covered by an iron roof in three spans, supported on iron columns and lattice girders. Each span is glazed, on the north side only, with Rendle's system of glazing, this arrangement favouring an equal distribution of light from the best aspect. The interior walls are lined with light buff bricks, relieved with red brick arches and purpose-made moulded brick strings and cornice. Concrete has been used for the floors and the arches over one-story shops; and the butchers' and fish shops, and the latrines, are all lined with white glazed bricks, having red brick strings and moulded brick cornices. The exterior is built with red Birmingham bricks and dressings of Stanton stone. The sculptured panel in the pediment over the principal entrance is a representation of King John granting a charter to hold a market at Burton to a former abbot, and it has a peculiar appropriateness, not only in connecting the present building with the early history of the markets, but because part of the site on which the building is erected was formerly part of the site of Burton Abbey. Messrs. Chamberlain Bros., of Burton-on-Trent, have been the contractors, and have carried out the work in a satisfactory manner. Mr. Roddis, of Birmingham, executed the carving and sculptured work. Mr. H. J. Corser acted as clerk of works under the architects, Messrs. Dixon & Moxon, of Barnsley.

DESIGN FOR THE VICTOR EMANUEL MONUMENT, ROME.

WE publish this week another of the designs submitted in the competition for the proposed monument to Victor Emanuel, by Signor Luigi Boffi. The two which we gave last week are stated to have received "first premiums" each, and were, we presume, bracketed together. The one by Signor Boffi received a second premium.

DESIGN FOR A THEOLOGICAL COLLEGE.

THIS fine drawing, with much picturesqueness of design, is the perspective view of the design for a theological college by Mr. J. O. Harris, of Bolton-le-Moors, which gained its author the Soane Medallion in the students' competition at the Institute. We referred to this and other designs in an article in last week's issue (page 327 ante).

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THE ARCHITECTURAL DRAWINGS.

AS a matter of course, Architecture is meagrely represented in this Exhibition, even more so this year than usual, owing, doubtless, to the circumstance that during the last twelve months no new buildings of great importance have been inaugurated. Of designs for new churches there are few, and none of them remarkable. A "Competitive Design" for a small church, by David Robertson, is in the emancipated Norman style to which the architect adheres. Of different stamp is the "Church of the Holy Spirit, Distington, Cumberland," by Hay & Henderson; it consists of a nave with clerestory and aisles, with a muscular tower at the north-west angle. The style is late thirteenth-century Gothic. Archibald Macpherson exhibits a drawing of "Part of Interior of Church of the Sacred Heart, Edinburgh." This church was designed by one of the Jesuit Fathers, and is outwardly a plain Renaissance building, showing a pedimented front lighted by three semicircular-headed windows, and having a doorway with broken pediment. From time to time additions have been made to the interior fittings and arrangement, which are of a somewhat superficial description, although not devoid of pictorial effect. The drawing in question represents one of these, which appears to be a chapel screened off from the body of the

interior. H. J. Blanc, in his "Design for New Church, Free St. Andrew's, Edinburgh," shows that, although his *forte* lies in the designing of Gothic churches, he can, when necessary, ably employ the Renaissance manner, which he has used in this instance as more appropriate for the site, and in better keeping with the surroundings than a Gothic building would have been. In the disposition of the various parts a picturesque effect seems to have been aimed at, but the small dome would be entirely eclipsed by the dome of the Parish Church of St. George, which is close at hand, and a spire would have been in a like position when in competition with that of the neighbouring cathedral. A tall slender campanile would have contrasted with and not come into competition with either dome or spire, and would have added a pleasing feature to the group which breaks the sky-line at the west end.

Mr. Blanc is mere at home in his design for "St. Luke's Free Church, Broughty Ferry," which is in the Early French Gothic style which he favours. It differs in several respects from his former designs, especially as regards the spire,—and is satisfactorily balanced as regards the disposition of nave, aisles, and transepts, which group compactly.

Messrs. Seymour & Kinross append their names to a view of "St. Baldrid's Church, North Berwick: exterior view of New Church." This church is certainly not new; it was designed by and carried out under the superintendence of the late Mr. John Henderson many years ago. Probably Messrs. Seymour & Kinross may have made some alterations upon this edifice, but if so the drawing gives no clue to them. "Lochend Church," by Hardy & Wight, is a small country church with nothing remarkable about it; but we have a peculiar view of a portion of the "Interior of St. Giles Cathedral, Edinburgh," as it appears to Miss Jessie Frier, whose imagination has clothed the really cold raw stonework with warm tints and stains which time alone can give. We have greater reliance in the faithfulness of the painting of a portion of "San Giovanni, Siena," by W. E. Lockhart, where the fine bronze reliefs in the Early Renaissance marble font by Ghiberti and others are depicted with great skill.

The Scottish Baronial style does not lose its hold in the land of its origin, but continues to be the distinguishing mark of the greater number of mansions of any importance in Scotland. This is in part owing to its being a national style, in harmony with the scenery of the country, and partly to its pliability, which admits of the free introduction of new features and detail which tend to modify the severity which pervades the old examples of the style.

"Cavers House, Roxburghshire, as about to be altered and enlarged" by Kinneir & Peddie, affords evidence of both the old and new manner of treatment. In the one we find a high unplastered basement, large wall space, and small window lights; in the other abundant and often large open light, and yet the old and new coalesce harmoniously. "Portmore House, Peeblesshire," by David and John Bryce, is a large and stately new example of the style; and "Linplum, East Lothian," by Shiells & Thomson, shows that it can be effectively used on a smaller scale. "Addition to Mr. Buchanan's House, Oswald-road," R. Morham, the original house, as well as the large addition now made to it, was designed by Mr. Morham. The style has some affinity to the Scottish Baronial, but is so softened by an infusion of the English element as to give it a character of its own, which is, perhaps, more suitable for a villa in the immediate proximity of others of a common-place description than if a more declared style had been adopted. "Aros, erected for Professor George H. R. Macleod," William Leiper, architect, is decidedly English in character, and is a pleasing rendering of the half-timber manner of construction.

"Abington House, the Seat of Sir Edward Colebrook, Bart., M.P.," by Kinneir & Peddie, has also somewhat of an English character, being a gabled mansion with projecting wooden roofs, but the body of the building appears to be of stone.

The "Houses erected in West Craigmillar Park," from the designs of Archibald Macpherson, are tasteful examples of suburban villa residences decidedly above the commonplace, and possessing an interest which distinguishes them from the characterless productions around them.

A "Residence, North Berwick," Hay & Henderson, architects, will form a picturesque

addition to the many picturesque villas in this favourite sea-side resort; and G. Washington Brown's clever sketches of "Suburban Architecture" show terraces effectively grouped, mostly in the Queen Anne or Free Classic manner.

"Proposed Business Premises and Dwelling-houses, Stirling," by Seymour & Kinross, are designed in a decidedly Queen Anne manner,—picturesque, but rather thin and liney,—where stone is the material proposed to be used.

Knox & Hutton's "Competitive Design for Elgin Town Hall" is Italian in style, with arched windows and campanile, elegant of its kind, but not what we would look for in the North of Scotland. Mr. J. Dick Peddie exhibits the elevation of the "Scottish Free Institution, St. Andrew's-square, Edinburgh,"—a building simple and undemonstrative, but which for many years has held its own as one of the ornaments of the city.

Mr. Scott Morton's "Drawing-room," Sydney Mitchell's "Hall and Staircases," and Alex. C. Dewar's "Dining-room" are all pleasing and effective examples of interior decoration. The "Banqueting Hall, Hallyburton House," a drawing of which is exhibited by Andrew Heiton, is, we presume, an ancient example; if not, it is a clever reproduction of a quaint interior of a bygone period. It appears to be of considerable size and height, has an open timber roof, and curious little galleries, &c.

A PROPOSED BRITISH SOCIETY OF TEXTILE INDUSTRY.

IN relation to this subject, Mr. B. H. Thwaite, C.E., has written a small brochure entitled "Arguments in Favour of the Formation of a British Society of Textile Industry."* Mr. Thwaite states in the preface that "The mechanical principles as arranged by England's inventive geniuses,—Watt, Arkwright, Crompton, Kay, and others,—for the production of textile fabrics, are now known to all the civilised nations which cultivate the arts of industry, and to the nation which most develops the intellect of its people and encourages the application of such intelligence for improving and cheapening the methods of producing textile and other manufactures belongs the commercial greatness of the future."

It is further suggested that the depression in the British trades is not altogether the result of causes of a transient character, but that constantly increasing foreign competition must also be credited as a by no means minor cause. Mention is made of the development of the textile industries in the United States, Russia, and other Continental countries, especially Germany and France, and it is pointed out that this industrial development in countries once supplied by us, must necessarily have a restrictive tendency on the demands for our manufactures. Further, that not only are these foreign countries becoming more and more independent of our manufactures; but they are now actually competing with us in foreign markets of which we once held the sole monopoly.

For years an elaborate and complete technological education has been given to the work-people of the French and German industrial centres; and we see the result in the superior manufactured products emanating from French and German looms; and the prosperity of the manufacturing towns in Alsace and Lorraine is greatly due to the intelligent action and unity of the citizens. In each of the manufacturing centres of Alsace and Lorraine manufacturers, engineers, merchants, and chemists, have banded themselves together to form societies for the encouragement of the local industries. For instance, there is the Society of Industry of Verviers, and those of Fournies, Lyons, Mulhouse, &c. These societies of men who in their various occupations are ever on the watch for improvements, cannot but be of great service to industrial welfare. The description of the Industrial Society of Mulhouse in this pamphlet will be of interest to those interested in the future condition of our manufacturing industries.

It is only necessary to mention that the Mulhouse Society is very comprehensive in its aims for encouraging local manufacturing industries; there are committees for consider-

* Arguments in Favour of the Formation of a British Society of Textile Industry, By B. H. Thwaite, Assoc. Inst. C.E., F.C.S., Memb. de la Société Industrielle de Mulhouse, &c. Manchester, Emmott.

dado are executed in polished Devonshire marbles. The organ, the whole of the parquetry, and the stalls of the choir (carved in walnut), have been presented by the Dowager Duchess of Argyll. The whole of the crypt or basement will be utilised for the heating apparatus. The works have been executed from designs by the architect by Mr. George Shaw, contractor. Mr. Joseph Seed is the clerk of the works, and Mr. H. Tinkam principal foreman to the builder.

Mr. Gribble concluded by saying that the Oratory was planned on the model of most of the Italian churches, and was the only one so planned in England, so that those who had no opportunity of going to Italy to see an Italian Church, had only to come here to see the model of one. He thanked the members for paying the Oratory this, their third, visit, and hoped when the building was completed they would not hesitate to come a fourth time.

TRADES' TECHNICAL EDUCATION.

THE ARTISANS' TECHNICAL ASSOCIATION.

At the second ordinary meeting of this Association, of whose aims and methods of procedure we have already given some account,* held on Saturday evening last at No. 1, Adam-street, Adelphi, the Council presented their second monthly report, which stated that the various trade committees were getting into working order, and that arrangements are being made for holding two conferences as to the best means of furthering the work of the Association,—one consisting of trade-union representatives, and another to which the members of the Royal Commission on Technical Instruction, the Council of the City and Guilds of London Institute, members of Parliament, employers, workmen, and others are to be invited. The report also mentioned that a Decorative Art Committee is now in course of formation, and workmen interested are requested to communicate with the Secretary. An increase of eighteen members since the last meeting was held was announced.

Mr. C. T. Millis read a short paper on "Trades' Technical Education," from which we extract the following:—

From the theorist's point of view, artisans require only a sound scientific training to meet their wants in the matter of technical education. The desire of workmen, on the contrary, is, adopting the words of Mr. Magnus in his introductory address on technical education at the opening of the Finsbury Technical College, "to learn in the school very little more than they might learn in the shop: they only want to learn it more quickly."

With neither of these extreme opinions do I agree. My own is that the instruction given in a trade-class should supplement and not supersede the training of the workshop. The idea that a trade can be taught in a class-room I believe to be a delusion, and that thus to train workmen would be to make them less efficient, and their workmanship less perfect, and to destroy the reputation of the workmanship and workmen of this country. The student in a class learns for the most part the opinions of only one man; in the workshop the young workman gleams the opinions of many men, and also obtains knowledge of certain rule-of-thumb methods not always to be despised; the latter is only to a limited extent to be learned in the class-room.

In the trades' class-room, moreover, the number of tools and appliances is necessarily limited, and the amount of material small. Besides this, the sum total of the work that can be done in a trades' class by any one student can be but small. That the best manipulative training is that of the workshop is also, I think, generally admitted.

Thus in every way we see that the thorough training necessary to turn out a good workman is not independent of the factory. Even with the attempt to supersede the factory by the class-room, I am afraid that the apathy of employers as to the technical education of their young workmen would increase, and possibly entire reliance would be placed upon the training they received outside the factory.

Were training in the class-room indeed possible, workmen so turned out could only in very exceptional cases be the equals of those who, already engaged in a factory, attended a

trade-class, and in that went through such a course of instruction as I now proceed to lay down. In confirmation of this view, I quote from a letter to the Secretary of the Royal Commission on Technical Education by Messrs. Varrall, Elwell, & Middleton, of Paris, in reply to an inquiry from the Commissioners as to the efficiency as workmen of the boys trained at the "Ecole d'Apprentis." They write as follows:—

"In reply, we beg to say that we find the boys trained at the Ecole de la Vilette to have a good idea of drawing, which enables them to understand the working drawings used in the works, but they are by no means efficient workmen; we find that the apprentices who are brought up to the trade in our own works or others are, age for age, far superior workmen to the boys trained at 'La Vilette.'"

I may add that I formed opinions similar to those just quoted when I visited the same school in 1878.

The instruction suitable for a trade class may for convenience be thus subdivided:—(1) mechanical drawing of the trade; (2) practical work of the trade; (3) physics of the trade.

(1) *Mechanical Drawing of the Trade.*—By this I mean the drawing which bears the same relation to the trade that machine drawing does to that of the engineer. There would come under this heading, for the building trades, the making of working drawings and application of geometry to the trades; in the sheet-metal trades instruction in pattern-cutting, and so on. All students should be taught to make working drawings, and how to set out their work from these. Further, I would suggest that no practical work should be done in the class-room except from working drawings made by the students themselves. The work done would thus become an illustration of how to use the drawings. By such means students would gain the power of designing and planning out their work for themselves, and of forming an idea of how their work will look when made up, to the saving oftentimes of valuable time and material.

(2) *Practical Work of the Trade.*—The instruction in this division should consist of lectures on the methods employed in the various branches of a trade, and of a certain amount of practical work in those branches in which, owing to division of labour, the introduction of machinery, and other causes, there is but little, if any, opportunity of learning in the workshop. We may take as examples,—for carpenters, handrailing; for bricklayers, brick-cutting; for sheet-metal workers, hollowing, raising, and planishing; and for plumbers, lead-working. It may also be advisable in some cases to give descriptions of the tools used in a trade. The work done should be neither elaborate nor large. Its character should be such as to give a knowledge of principles and practice sufficient to enable a student to follow out details, if possible, of work in the factory, where alone he will acquire dexterity. The carpenter need not in the class-room fit up a complete staircase, nor the bricklayer construct a complete arch; nor the sheet-metal worker make either a bath or an urn, or cover a roof. Portions only of such work are necessary for a student's wants, if already engaged in a trade connected with the class he is attending. We have a right to assume that a fair knowledge of a trade is either possessed by or is within the reach of any one claiming to be a member of the trade, and that such a one comes to the trade class to supplement his knowledge.

(3) *Physics of the Trade.*—The properties of the various materials used in the trades would be dealt with here. The instruction should be by lectures and experiments; the latter to be carried out by the students themselves whenever possible. The question of the shrinking, warping, seasoning, &c., of the various kinds of wood would come under this head. So also would the preparation of mortars and cements, the qualities of the several kinds of bricks; the properties of metals, the treatment of metals in their several manufactured conditions; the properties of alloys, the composition of solders, and so on. The work in a class under this head may be termed its laboratory work.

Passing under review the training I am advocating for trade classes, it will be seen that a trade class-room suitable for such training would have to be partly drawing-office, partly workshop, and partly laboratory, and that instructors for such classes must possess a practical trade knowledge as well as a knowledge of the sciences connected with a trade. Technical teachers

whose knowledge of a trade is principally book knowledge, with a little science added, are not truly technical teachers at all. Nor, on the other hand, can courses of education in science alone be called courses of technical education. I make this remark, because, since technical education has become fashionable as a topic, it is most distinctly the fact that instruction in no way differing from what was formerly given as scientific is now often termed "technical," to which appellation it has no title whatever. With artisans themselves the power, in great measure, resides of ensuring that in this matter of technical education, the word of promise to the ear shall not be broken to the hope.

Apart from such trade classes as I am advocating, I hold that there is, and always will be, plenty of scope for the teaching of pure science, either simultaneously with or after the technical teaching, and that any idea to the contrary is a serious error. I lay particular stress on this as there undoubtedly is an impression abroad that with the establishment of such trade classes there will be but little room left for the teaching of science. My own opinion is that with the establishment of such classes the demand for science teaching will steadily increase.

Courses of Instruction for Artisans.—My experience as a student and a teacher has impressed upon me the need for some sort of guidance to the workman as to the studies he should take up. Particularly was my attention drawn to the matter whilst acting as secretary to the late Artisans' Institute. At the Finsbury Technical College and the Polytechnic I am glad to note that courses of instruction are laid down, and that every inducement is offered to the student to go through the course that is allied to the trade in which he is engaged. I give below the subjects that, apart from attendance at the actual trade class, should be taken up by carpenters, bricklayers, sheet-metal workers, and plumbers respectively, in the order in which, I think, they should be studied. Here, however, students require a word of caution. They must be careful not to take up more subjects in any one year than they can comfortably get through, or they will find themselves unable to keep up with their work, and will become disheartened instead of deriving pleasure from it.

It is assumed that before taking up any course whatever students have a fair primary education. It will be seen that practical geometry forms one of the subjects in each course given, and I should strongly recommend that even if other subjects have to be passed by, practical geometry should not be passed by, seeing that, with a knowledge of this, the drawing connected with any trade becomes more interesting and better understood:—

Carpenters.	Bricklayers.
Freehand Drawing.	Freehand Drawing.
Practical Geometry.	Practical Geometry.
Elementary Mathematics.	Elementary Mathematics.
Building Construction.	Building Construction.
Elementary Applied Mechanics.	
Sheet Metal Workers.	Plumbers.
Freehand Drawing.	Freehand Drawing.
Practical Geometry.	Practical Geometry.
Elementary Mathematics.	Elementary Mathematics.
Inorganic Chemistry, or Practical Metallurgy.	Inorganic Chemistry.
	Building Construction.

It is often urged against giving courses of instruction to artisans that such courses are unnecessary and superfluous, and will make men neither good workmen nor better off. The answer to this is that, on the contrary, a good general knowledge is calculated to make men better both as workmen and as men, and those possessing such knowledge are likely to be pecuniarily better off as well as more independent. Moreover, owing to the great strides general education is making in this country and on the Continent, a more liberal course of instruction for artisans than formerly given has become compulsory, and necessarily it must be in those subjects which are more or less closely connected with the several trades.

That men who have reached middle age, or have family or other ties, will take up such courses of instruction is not to be expected; it is, however, to be looked for that young men and apprentices between the ages of fourteen and twenty-three should devote two or three evenings a week to the work of becoming acquainted with the various subjects connected with their trades. Much pleasure as well as advantage is to be derived from such study

* See *Builder*, pp. 144, 175, *ante*.

and they will certainly not be any worse off in possessing a wider knowledge than that which is absolutely necessary to enable them to earn a living. I am well aware that the wages side of the question is an all-important one; but a still nobler side is that of self-improvement, and I would strongly impress it upon workmen who are themselves unable to take up a course of instruction or attend trade classes, that they should encourage the younger men and apprentices, in whom, indeed, our hopes rest in the work of technical education, so to do. Members of this association cannot better aid the cause than by giving the like advice to those whom they represent. With this effectually done we shall no longer have to lament the small attendance at our various classes,—small indeed as compared with the number engaged in the various trades for which the classes are formed. In this respect, however, it is gratifying to find that there has been an improvement in the last two or three years.

ARCHITECTS' BENEVOLENT SOCIETY. ANNUAL MEETING.

THE thirty-fourth annual meeting of the Society was held on Wednesday afternoon last, in the Rooms of the Royal Institute of British Architects, Conduit-street, Mr. John Whichcord, President of the Society, in the chair.

Mr. W. H. White, hon. sec., read the report, of which the following is a summary:—

During the past year there had been fewer applications for relief than in 1882, and the grants had been less in total amount. In 1882 the sum of 527*l.* was given away to 36 persons; but in 1883 the sum of 478*l.* was given to 28 persons. But the subscriptions of contributors had increased, and in 1883 they amounted to 344*l.*, as against 323*l.* received during the previous twelve months. At the beginning of the past year the funded property of the Society consisted of 5,550*l.*, invested in the New Three per Cent. Annuities, while a sum of about 90*l.* remained on hand for the purpose of further investment. A donation of 500*l.* was also received from Mr. Samuel Page, and this unexpected increase partly induced the Council to consider the advisability of purchasing Stock likely to afford a larger interest. They had consequently purchased 4,000*l.* of London and North-Western 4 per cent. Debenture Stock, but still held 1,500*l.* in the New Three per Cent., while 30*l.* of donations still remained to be invested. As the result of an appeal made last year, nine new subscribers had been obtained, and donations received from Messrs. R. W. Ellis, G. Godwin, S. Hill, J. Jennings, R. Keirle, R. P. Pullman, E. C. Robins, J. E. Saunders, L. Solomon, E. J. Tarver, and J. G. Turner. The Architectural Association had become an annual subscriber of 10*l.* 10*s.*, and the Ecclesiastical Surveyors' Association had contributed a like amount during the past year. Donations had been made by the Liverpool Architectural Society and the Nottingham Architectural Association, and by the Worshipful Company of Carpenters, to which latter body a special appeal was made. A correspondence opened by the Association with the various architectural societies in the United Kingdom had resulted in several gentlemen becoming the representatives of this Association as local honorary secretaries in several districts of the country. The following had accepted the duty, viz., the hon. secretary of the Birmingham Architectural Association, for Birmingham; Mr. John McLachlan, for Edinburgh; Mr. John Housman, for Glasgow; Mr. E. Dudgeon, for Leeds; Mr. Aldridge, for Liverpool; Mr. W. Jackson, for Leicester; Mr. John Holden, for Manchester; and Mr. T. Oliver, for Newcastle. The Council would be glad to make similar appointments in other districts, especially in the north-east and south-west of England. The advice and assistance afforded already by these gentlemen lightened the responsibility of the Council in granting relief to persons at a distance, and increased the power of the Society in making known its needs and objects. The Council desired to thank the Institute for the assistance rendered; and to acknowledge the aid afforded through the inquiries of the Charity Organisation Society.

The President, in moving the adoption of the report and accounts, said that, although the report was hopeful and encouraging, it would be far more satisfactory when they could report a fund of 10,000*l.* invested. There was little to remark upon, except to notice the change in the nature of the investment of part of the funds. The Council considered that the change they had made would enable them the better to meet some of the painful cases that occasionally came before them. The pecuniary result of the change would be to increase their income by 20*l.* or 30*l.* a year. Another matter of congratulation was the help obtained from the local hon. secretaries. The result of that, he hoped, would

be to increase both the funds of the Association and the sympathy felt in its work. From the prominence of those gentlemen in their respective localities, he hoped they might anticipate a great deal of good to the Society. He could only commend the Association's work to all the profession, regretting that not one-fourth of the members of the Institute had yet become subscribers.

Mr. E. N. Clifton seconded.

The resolution was adopted *nem. dis.*

The Hon. Secretary then reported that the following gentlemen retired from the Council, having served three years, viz.:—Messrs. Gruning, I'Anson, Scamell, Wells, and Wyatt. The Council recommended the following gentlemen to fill the vacancies, viz.:—Messrs. A. Waterhouse, A.R.A., E. N. Clifton, Cole A. Adams (President of the Architectural Association), W. Emerson, and Lewis Solomon.

The recommendation was adopted, and with that alteration the president, council, and hon. officers were re-elected.

Mr. Hebb and Mr. B. E. Ferrey were elected auditors for the ensuing year.

Mr. E. N. Clifton moved, formally, a vote of thanks to the President and Council. Mr. Florence seconded. In reply, on the motion being carried, the President said they were all animated with a sense of duty in advancing the interests of the Society, but the bulk of the work fell on the honorary secretary and treasurer and the auditors.

A vote of thanks to the auditors of the past year (Messrs. J. G. Turner and R. St. A. Roumieu), was then carried, on the motion of the President.

Mr. Rickman proposed a vote of thanks to the Royal Institute of British Architects for the use of the rooms and for the assistance given to the Society. He thought the fact of fewer grants being made in the past year showed that the profession was not so badly off as formerly, but this was only a reason why they should receive additional subscriptions.

This motion having been seconded by Mr. Scamell and carried, the proceedings terminated.

BRISTOL MASTER BUILDERS' ASSOCIATION.

THIS Association held its annual meeting and dinner at the Talbot Hotel, Victoria-street, Bristol, on Thursday evening, the 6th inst., at which there was a large attendance. Mr. A. Krauss, the president of the Association, occupied the chair, the vice-chair being filled by Mr. George Humphreys. The company included Messrs. W. Benson, W. H. Brown, J. Bastow, J. E. Davies, W. H. Phillips (secretary), T. J. Scoones, J. Thorne (treasurer), G. H. Perrin, (Taylor & Low Bros.), R. Bancroft (Bancroft & Harris), W. Brock (Brock & Bruce), H. A. Force, O. W. Weeks (King Bros.), T. K. Talland, W. H. Cowlin, E. J. Hatherly, J. Wilkins, and others. After the usual toasts,

Mr. W. H. Phillips, the secretary of the Association, read the annual report, which stated that few matters of special importance had engaged the attention of the committee, but all subjects that seemed to affect the trade had been carefully watched.

In common with other builders' associations, the committee had memorialised the House of Commons in opposition to some of the provisions of the following Bills:—The Steam Boilers (Persons in Charge) Bill, and the Employers' Liability Act. The clauses relating to the buildings contained in the Omnibus Bill promoted by the Bristol Corporation were carefully considered by the committee, but it did not appear desirable to take any action. Each member should give the earliest intimation to the secretary of any subject likely to be of general interest or benefit to the trade.

The Chairman, alluding to the report, mentioned that the effect of the Steam Boilers Act would have been that every employer using steam power would have been obliged to keep a certificated man in charge, and the members of the Association would understand to what an extent that would have affected the trade. In the event of the certificated man being ill on a Monday morning, they would be obliged either to employ another man with a certificate, or suspend the use of the steam. Referring to the Employers' Liability Act, he urged upon employers the importance of insuring themselves against accidents in the Master Builders

Society. Having mentioned that he had had to fight a claim for 1,200*l.*, which had been reduced to 200*l.*, the president moved the adoption of the report.

The vice-president (Mr. Humphreys) seconded the motion, which was adopted, and Mr. Krauss, Mr. G. H. Humphreys, and Mr. J. Thorne were appointed respectively as president, vice-president, and treasurer for the ensuing year.

INTERNATIONAL HEALTH EXHIBITION.

THE Council of the Society of Arts announce that they are prepared to award the following prizes in connexion with the International Health Exhibition:—

Under the John Stock Trust, a Society's Gold Medal or 20*l.* for the best example of sanitary architectural construction, Classes 20, 28, 29, 30, 32. Under the Shaw Trust, a Society's Gold Medal or 20*l.*, for the most deserving exhibit in Classes 41, 42, 43, and 45 (relating to Industrial Hygiene).

Under the North London Exhibition Trust, a Society's Gold Medal or 20*l.*, for the best set of specimens illustrating the handicraft teaching in any school. Classes 49 and 50.

Under the Fothergill Trust, Two Gold Medals (or two sums of 20*l.*), one for the best exhibit in Class 27 (Fire-Prevention Apparatus), and one for the best exhibit in Class 26 (Lighting Apparatus).

From the Trevelyan Prize Fund, Five Gold Medals (or five sums of 20*l.*) for the best exhibit in each of the following Classes,—2, 3, 6, 7, and 11 (all comprised within Group 1, "Food").

Each prize will be a Gold Medal, or the sum of 20*l.*, at the option of the recipient.

The Council proposes to ask the juries in each class to recommend for their consideration either two or three exhibits which they might consider deserving a prize.

INTERNATIONAL MACHINERY EXHIBITION, VIENNA.

AN international exhibition of motors and implementary machinery for the smaller industries will be held at Vienna, in the localities of the Imperial and Royal Horticultural Society, by the Industrial Corporation of Lower Austria, under the Protectorate of H. I. and R. H. the Archduke Carl Ludwig.

The exhibition will be opened on the 24th of July, and will close at the latest by the 12th of October, 1884, and will contain the following groups:—I. Motors (up to 3-horse power). II. Transmitters. III. Tools, implementary machinery, and working appliances. IV. Physical and chemical apparatus. V. Means of reproducing graphic impressions. VI. School and teaching appliances for technological instruction.

Applications should be addressed not later than the 1st of April, 1884, "An den Niederösterreichischen Gevebervereine I. Eschenbachgasse 11 Wien, Austria," on forms obtainable from the above-mentioned quarter.

There will be no prizes awarded, but each exhibitor will receive a memorial medal and certificate of participation at the exhibition.

Motors and machinery will be examined and tested by a special Commission, which will give certificates of the results of such trials.

DUTIES ON STONEWARE PIPES IN FRANCE.

THE Union of French Ceramic Manufacturers recently appointed a committee to examine the above question with a view to allowing the French industry to compete more successfully than at present with imported articles. Amongst the matters brought to the notice of the Minister of Commerce is the fact that stoneware pipes, instead of being taxed according to paragraph 323 of the General Tariff, are allowed to enter free of duty by a decision of the Consulting Committee, made in 1863. In claiming a readjustment in this respect, the committee urges that French manufacturers are entitled to protection on account of certain disadvantages in their industrial position. It is also remarked that trade has materially changed since the decision in question was made in 1863.

Art Needlework.—An exhibition of ecclesiastical embroidery will be open at the Royal School of Art Needlework, in Exhibition-road, on Monday, March 24th. The private view will be on Saturday, the 22nd.

ASHBURNHAM HOUSE AND
WESTMINSTER SCHOOL.

CARPENTERS and bricklayers are still busy upon the alterations and repairs which were taken in hand several months ago, after the deaths of Mr. Turle and the Rev. Lord John Thynne, sub-dean. The house of the former, whose we lately printed a sketch*—is being replaced with a set of school class-rooms in red brick, with stone dressings. This new building stands between the big school-room (the monks' dormitory) and the eastern wing of Ashburnham House. Its site is that of the Convent Priory Dorter or Necessarium communicating with the Great Dormitory by the plain round-headed doorway that recently was brought to view. It is in violent contrast with the picturesque irregular group of gables and dormers which characterised its predecessor, dating, as is believed, from the middle of the sixteenth century, but retaining many relics of the earlier Norman fabric. A new arch is set in front of the ancient wagon-headed opening made through the former Misericorde wall. In this manner we lose all the effect of a favourite old corner; while the view is changed of the "dark entry" from Little Dean's-yard to the Great Cloisters beyond. For the lodge-entrance with its flanking walls, in front of the house, are substituted a dwarf wall and piers capped with stone balls, supporting a somewhat light but elegant railing and gate. The summer-house that stood in the back garden against the interior of the Refectory wall, and which was attributed to Inigo Jones, has disappeared. The beautiful drawing-room and one or two other apartments of Ashburnham House are temporarily occupied as school-rooms. We understand, however, that as soon as the new buildings are completed, the central portion will be fitted for the purposes of the head-master and his conjutors. The ante-room is decorated afresh and will serve for the school library to be established in honour of Dr. Scott, lately head-master.

MONUMENTAL ARCHITECTURE AT
HAMBURG.

THE metropolis of North-Western Germany has lately augmented its public buildings by the erection of the Criminal Courts, the enlargement of the Exchange, and other works of an imposing character. Preparations are now being made for the building of a Museum of Natural History. The structure is intended to receive extensive zoological, mineralogical, geological, and paleontological collections, and is to contain two lecture-rooms. The cost is not to exceed 45,000.

A competition will take place in two divisions, one of which (according to the *Deutsche Bauzeitung*) will be open and general, while the other will be limited to five designs chosen from those submitted in the preliminary test. These five plans will each receive a prize of 50*l.*, and the authors will have to declare within fourteen days whether they desire to participate in the subsequent competition, arrangements being made as to the replacing of such as wish to retire before the final stage is reached. During the four weeks succeeding the preliminary competition, the commission and the judges will decide whether the original building programme will be maintained in its original form, or modified in accordance with the ideas gained from the preliminary test. The plans (ground-plans, façades, and sections) are to be sent in anonymously by the 30th of April. They are to be on the scale of 1 : 200, and are to be accompanied by descriptive reports and drawings in perspective when such are desirable.

The competitors whose works are selected for the final competition have a further time of six months given them to complete their labours, for which they receive a sum of 200*l.* They have to furnish ground-plans, façades, and sections on the scale of 1 : 100, and details on the scale of 1 : 25. These are to be accompanied in each case by a special descriptive report and an estimate of cost, with calculations of quantities, and quotations for units of measurement. According to the programme, the author of the design selected will receive a further sum of 200*l.* (thus completing 1 per cent. on the estimated cost) in the event of the plan not being executed. If the work is executed a further remuneration of 3 per cent. will be given; thus in all 1,800*l.* A public ex-

hibition will take place of the five designs admitted to the final competition, and the judges will publish their award with explanatory remarks.

SALE OF THE MATERIALS OF TOTHILL
FIELDS PRISON.

DURING the present week the first portion of the building materials of Tothill-fields Prison, Westminster (upon the site of which,—about five acres in extent,—a new Roman Catholic cathedral of large dimensions is, as was mentioned in our last, about to be erected), has been sold by Messrs. Horne, Son, & Eversfield. The sale commenced on Monday, and was concluded on Wednesday, 445 lots having been disposed of in the three days. There was a numerous attendance of dealers in building materials at each day's sale, and what were considered fair prices for the various materials of the prison paid. The first day's sale embraced the materials of the infirmary and reception cells, the north side of the officers' quarters, and six other of the prison buildings, 183 lots having been disposed of during the day. The second day's proceedings consisted of the sale of the materials of the officers' quarters on the south side, those of the oakum stores, three buildings, the materials of the garden (24 lots) consisting, amongst other lots, of 7,984 ft. of granite pitching, and all the trees, shrubs, and turf. The last day's sale consisted of the materials of the chapel, the governor's residence, the kitchen, and the inside and outside lead in the several buildings, said to weigh 190 tons. This was divided into 36 lots, and closed the sale. The total proceeds of the three days' sale amounted to £5,300, the lead alone, we understand, realising £2,300. The buildings sold during the three days are estimated to contain 10,000,000 bricks. The materials of the remaining buildings and the prison enclosure walls, the latter being between 2 ft. and 3 ft. in thickness and about one-third of a mile in length, will be sold some time in April next, and it is expected that the site of the prison will be entirely cleared and ready for the commencement of the intended cathedral building not later than the end of July.

WESTMINSTER ABBEY:
PROPOSED "SOUTH TRANSEPT."

SIR,—I am very unwilling to inflict another letter upon you on the subject of the new south transept of Westminster Abbey, but Mr. Somers Clarke's challenge is too direct to admit of my passing it over in silence. It is easy, of course, for one so exceptionally familiar with the precincts as he is, and residing in Dean's-yard, to point out inaccuracies on minor points in one who, like myself, has had no means of access to the buildings in question, and who, consequently, is obliged to depend wholly on written and published documents for his information. There is nothing, however, in Mr. Clarke's criticisms that, as far as I can judge, affects the main points at issue, and I shall not therefore attempt to notice them in detail; they are not such as have any real bearing on the more important questions in dispute, or can really affect the conclusions I have arrived at.

Since I wrote last I have visited the Infirmary Hall, and can now speak from personal knowledge. It is a room about 32 ft. long by 22 ft. wide,—the size of an ordinary London drawing-room,—covered by a roof of an ordinary Medieval barn. Its outer walls, so far as they are visible, were rebuilt from the foundation by the late Sir Gilbert Scott, and the roof put into a thorough state of repair. What that means we generally know too well, but how much of the old roof remains I have no means of knowing. It now forms an appropriate vestibule to two second-class residences of minor canons. If it stood alone it no one would propose to meddle with it, but if its existence is pleaded as a bar to an important public improvement, I, for one, would advocate its removal. It has no architectural beauty, and in its present state very little archaeological interest.

I have also gained access to the private garden in which the remains of St. Catherine's Chapel are situated, and seen enough to prove that, when the Ordnance survey was made in 1871, it represented the state of the garden as it then occupied the site with perfect accuracy. Mr. Hillman's letter, in your last issue, details what has since been done in

the way of excavations. Two rude stones forming part of the foundations of the altar were discovered in the trenches, and consequently mark its site. The removal of a portion of a house has revealed a large fragment of the southern wall of the choir, but in a dreadfully ruinous condition, and the site of the pillars of the nave has also been ascertained, and corresponds with the one that stands in a corner on the south side. Every vestige of the chapel on the north side has been removed, and a commonplace modern residence recently erected on its site. If these remains, insignificant though they are, were situated in the country, and in any locality where their site was not wanted for other purposes, I would be the last to recommend their being touched; but I cannot conceive any but the most fanatical antiquary insisting that their preservation should be a bar to a great public improvement, assuming that it is agreed to be such on other grounds. A brass plate fixed on the floor of the new building would mark the spot where the altar of the chapel once stood, with more distinctness than the present two stones, and serve to recall the dispute between the two archbishops, and its locality, more clearly than can be done by the present half-buried fragments. Their disappearance would hurt the feelings of no one. Of the numberless people who annually visit the Abbey, not one in 10,000 ever heard of their existence, and fewer still have ever seen them. Till very recently the bulk of them were buried under 3 ft. or 4 ft. of rubbish, or hidden by modern erections. The consequence is, that if they disappeared to-morrow,—which, but for this stir they probably would have done, under some new second-class residence,—few would have been the wiser or the worse.

This is not, of course, the place where one can enter on the question of how St. Stephen's Chapel was roofed, but I can only say that when Mackenzie's work on the subject appeared in 1846, I went very carefully and, I fancied, exhaustively, into the whole question, and examined all the available evidence on the subject. The conclusion I arrived at was that the chapel was one-storied and covered with a hammer-beam roof, similar in principle to that afterwards adopted for Westminster Hall. Of course it was adapted, as Mr. Clarke says, to one only 33 ft. in width, but, as the Mediaeval architects afterwards applied its design to one 68 ft. in width, he must have a much milder opinion of the profession than I have if he believes that an architect cannot be found who can design one that would be appropriate for a roof 50 ft. span. It is, however, unfortunately the rule that what has been done in the Middle Ages may and can be reproduced, but what has not been done dare not and must not be attempted. It is this narrow archaeological view of the art that pervades all Mr. Clarke's criticisms on my proposals. In making the sketch you published, I purposely avoided copying the dimensions of the Abbey, either in elevation or in plan, but proposed something more spacious and of larger parts, more worthy, it seemed to me, and more characteristic, of the age in which we live.

It is, I conceive, the narrow archaeological view generally taken by architects of the beautiful architecture of our forefathers that is bringing it into disrepute; and, in a notable instance, rendered Mr. Street's new Law Courts the utter failure they are now generally admitted to be. But by a larger and bolder treatment I believe the new south transept, without being a copy or pretending to belong to the thirteenth century, might be made a thing of beauty and worthy of the nineteenth. If the scheme now proposed were entertained by those who have the power to direct the movement, I am not without hopes that an architect may be found who can and will carry this design out, so as to render it worthy of the Abbey to which it would be attached.

JAS. FERGUSSON.

20, Langham-place, March 12, 1884.

* * We cannot print more letters on this subject at present.

Lecture at the British Museum.—Professor Hodgkin's, whose previous lectures on Anglo-Saxon work at the British Museum we reported, is to deliver a further course of six lectures in the Anglo-Saxon Room, on Wednesday afternoons, commencing the first Wednesday after Easter. The subjects of these lectures will be, "The Jar," "The Casket," "The Horn," "The Rune," "Illuminated MSS.," and "The Coin."

* See *Builder*, vol. xlv., p. 620 (October 20th, 1883).

THE BRITISH MUSEUM.

SIR,—Apocryph to your recent article [p. 187. ante] upon the Kouyunjik Gallery and its new catalogue, will you permit me to say that I trust the authorities of the Museum will see their way to publish other catalogues of the various antiquities of the same kind, though, it may well be, not quite so minute in description? Also that the Museum may be opened to the public on week-day evenings, if not on Sundays, as the present plan of closing at four p.m. effectually excludes all students and others who have their living to get. No one connected with the building trade, for instance, can ever get a chance of seeing the treasures the Museum contains unless he takes a special holiday for the purpose. There can be no question now of the practicability of lighting the building without risk of fire. That question is absolutely settled, and electric arc lights are used in the building. It now only remains to introduce the incandescent lights, and to keep the place open in the evenings to enable the great bulk of our people to become acquainted with its contents. Mr. Frith, R.A., in a recently-published letter, suggests the same thing for the National Gallery, which, he says, ought to be opened in the evenings to enable a busy man like himself to study the old masters, time for which he cannot afford in the short light of a winter's day.

I take this opportunity of mentioning what appears to be little known, and may be of interest to many of the readers of the *Builder*. In a conversation I had with Mr. Budge, Dr. Birch's able assistant, at the British Museum, during the autumn of the past year, that gentleman introduced to my notice a series of translations into English of Assyrian and Egyptian inscriptions in the collections of the Museum, the Louvre, and other places. These are published by Bagsters in twelve small volumes, and will be found to be exceedingly interesting to students of ancient history, and convey to the mind better ideas of the condition of the human race in very early times than it is possible to obtain from the earliest writers. I am sure these only require to be known to be appreciated, and, as there is plenty of material to form another series, it is to be hoped the publishers will be well supported in their venture. The volumes are issued at the low price of 3s. 6d. each.

E. GRIMES.

Birmingham, March 10, 1884.

THE QUARRIES OF CAEN.

SIR,—As some account of these famous quarries may be acceptable to your readers, I send you a description derived from a recent visit to the spot. They lie about two miles to the south of Caen, in the immediate neighbourhood of the village of Allonne, and consist of an extensive ridge of rocks overlooking the valley of the Orne, and stretching far southwards. The upper surface is a level plateau in a high state of cultivation. In ancient times the stone was excavated from the face of the rock or cliff, vast catacombs being thus formed. Later on, however, shafts were sunk in the plateau or fields to the depth of 50 ft. to 70 ft., out of which the stone was hoisted by windlasses. Of this kind was the quarry I visited the other day. Not caring to descend by the steep ladder, I got one of the workmen, who was furnished with candles, to lead me by one of the openings on the face of the rock to where the quarrymen were at work. The passage is from 20 ft. to 25 ft. wide and 15 ft. high, and is excavated in a seam which furnishes the most even-grained stone. The upper and lower layers are said to be of a different geological formation of uncertain texture, and sprinkled with pebbly blocks of various size, which prevent the stone from being sawn. The seam which is at present being worked is comparatively soft and uniformly even, being free from cracks and faults, and is, moreover, of a rich fawn colour. The blocks vary according to the dimensions required, the largest containing 5 cubic yards, which the strength of the crane and chains is not allowed to exceed. The workman begins by cutting two deep channels in the face of the rock in a perpendicular direction, about 4 ft. or 5 ft. in length, and the same in depth. He then cuts a similar channel 4 in. wide horizontally at the base of the block, leaving it attached at its top and hinder surfaces. He then cuts a channel horizon-

tally along the top, about 6 in. in depth, into which he inserts wedges. These are driven in by degrees until the block is separated from the rock above and at the back, and falls upon the bottom prepared for it. It is then withdrawn by means of levers and placed upon rollers on which it is conveyed to the shaft to be lifted out by the crane upon a wagon for transport. A workman takes two days to cut the channels of average-sized blocks, and his earnings are 3 to 4 francs a day. The quantity of stone exported from Caen is very considerable, amounting, I was told, to from 200 to 300 shiploads a year. It is sent to many parts of the world, even as far as America; and it forms, indeed, one of the principal industries of Caen. The quarries being so near at hand it is needless to say that the town of Caen is built exclusively of stone. The modern public buildings are constructed of very large blocks, which are as thick as the walls they form. The stone lasts well here. The old churches are nearly as fresh as they were when built, and have suffered little from decay occasioned by the weather. They have no rule here for laying the stones of the building as they were bedded in the quarry.

W. H. LANGHORNE, M.A.

Caen, March 8, 1884.

MEDIÆVAL ARCHITECTS.

SIR,—So little is known relative to the architects of the thirteenth century that perhaps you will allow the question to be put through the pages of the *Builder*, as to whether any of its readers may be able to shed additional light on the history of the man whose name is found mentioned on the dates given in the accompanying list.

JAS. THOS. IRVINE.

Mount Pleasant, Lichfield.

1205. Magr. Elias de Derham, rector of the Church of Meanton. Rotuli definitus, p. 271.

1207. E. de Derham, executor of H., Archbishop of Canterbury.

1209. Helias de "Derham," Walpole supposes to be the same as Elias who repaired King John's Palace at Westminster that year, who certainly was an architect.

(Year doubtful.) Elia de Derham, Seneschal to Bishop Joceline de Wells and also a vicar at Wells.

1213. Magro. Elie de Derham about King's Works.

1218-1234. Helias was a Canon at Wells.

1220. Elias de Derham, Canon of Sar., architect or master of works, Salisbury Cathedral, was present at the first celebration of divine service at Salisbury Cathedral in 1220.

1232-1233, 1235-1236. Elie de Derham is mentioned in connexion with Winchester Castle Works.

17 H. 3 and 20 H. 3.

About 1243. A John de Derham at Wells.

EXHIBITION OF WORKS IN WOOD.

SIR,—Will you kindly allow me to call the attention of your numerous readers to the Exhibition of "Works in Wood" about to be held under the auspices of the Carpenters' Company and the Joiners' Company of the City of London at the new hall lately erected by the former company, at the corner of Turgotmorton Avenue and London Wall?

It is well known that these two companies had for many years the entire control, and, indeed, monopoly, of the two crafts whose name they bear, and it is doubtless owing to this fact that British workmen, and especially Londoners, attained to their rare excellence in those branches of art. The days of restriction and search for bad workmanship are past and gone; but there seems no reason why the spirit of emulation, so rife in these days, should not be evoked to produce similar results.

These two Companies have therefore determined to invite British workmen generally to compete in the several branches of these crafts, and have offered a number of prizes, details of which can be had by application to the Clerk of the Carpenters' Company. The number of responses received warrants the belief that there will be a good collection of articles of interest, of which a large number will be made for the occasion.

I hope that many more of your readers will find time to prepare something for the Exhibition, and as it is proposed to form a Museum of every kind of illustration of both carpentry and joinery, the Committee will be much gratified by receiving, merely for the purpose of exhibition, any models or drawings of existing or ancient works in wood which would be of interest in showing the kind of work done both in the olden and the modern times.

The Exhibition will be open about the middle of May, and will continue open for about three weeks, from eleven o'clock in the morning till five o'clock in the evening on four days in the week, and till nine o'clock on Wednesdays and Saturdays.

WILLIAM WILLMER POOCK,

Master of the Carpenters' Company,

VICTOR EMANUEL MONUMENT COMPETITION.

SIR,—Referring to your illustrations of two of the selected designs (issue of 8th current), I would note a remarkable departure from the stipulations of the competition in Sig. Sacconi's design. It was an express requirement that the upper central building should be 29 metres high in centre and 24 metres at sides or wings. This has been in the main carried out in Sig. Bruno Schmitz's design, to his evident disadvantage, as I, at least, consider the "Sacconi" design the better of the two. It is not easy to see why such a condition was imposed if not intended as binding. I made many inquiries during the progress of the competition as to the reason for this, but could get no explanation, and I quite see now that my design was made at a disadvantage. Possibly I could have disregarded the condition imposed, but as it was one of a very few express stipulations I did not think myself at liberty to ignore it.

ANOTHER COMPETITOR.

PIPES v. FAÇADES.

SIR,—In your issue of the 8th inst. we notice a letter from Mr. W. P. Buchan, in which he claims, or, rather, from which he *would* claim, the invention of a glass-germ filter, in conjunction with exhaust ventilating pipes from house-drains, sewers, &c.

Now, as we adopted this plan, and have had it in practical operation for many months, we can inform Mr. Buchan that the result has been satisfactory, but he must not claim it as his patent.

We may add, we first thought of using sponge for the purpose, not asbestos, but we finally decided to use coke, which was kept saturated with a powerful disinfectant.

We gave the preference to coke, considering it cheapest, and more durable than sponge and cotton.

BANKER BROS. & CO.

P.S.—We have not patented this plan, but feel it necessary not to allow Mr. Buchan's letter to pass unnoticed by us.

BELGIAN GRANITE.

SIR,—I presume that the stone mentioned by Mr. Stagg [p. 356] is the same as that known by the same name in Berlin, where it is much used for the plinths and basement facings of several of the most important public buildings; for instance, the Institute of Natural Sciences, the Imperial Bank, the Art Trades' Museum, and the New Courts of Justice at Moabit, where it is unpolished.

It is also known as Belgian marble, because it can receive a polish, and as Belgian limestone, the latter correctly. It is not an artificial stone, as Mr. Stagg supposes; neither is it a granite, though it is called by that name, owing to its excessive hardness, large and variable grain, and possibly also from its colour, which, when worked, is a deep blue grey. It is, in fact, a carboniferous limestone of good colour, very hard and durable, well suited to massive monumental or plain work.

HUGH McLAHLAN.

COST OF PRIMARY SCHOOLS.

SIR,—Is there any recent Parliamentary or other return giving the cost of public elementary schools in different parts of the country? A few years,—perhaps three,—after the Elementary Education Act was passed, a return was made to Parliament which dealt with the work done up to that time in a very interesting way. In the annual reports of inspectors there are occasional instances of excessive cost, but neither the inspectors nor the statistics in the Annual Report of the Department give any considerable amount of information applying to various places in a good serviceable form. What is wanted is,—Number of school places at superficial feet per child in school and class rooms; cost of the buildings and appliances complete, including site, for such a number; ditto, without fittings and site.

AN INQUIRER.

Tabary's Metallic Cement.—We have received from Messrs. Dreyfus & Co. a specimen of this material, which is intended as an artificial stone impervious to weather. According to the description of the patentees, "it is composed of a stone of trachytic origin, reduced to powder, according to the grain of the stone which has to be reproduced, and the molecules are reunited by an acid and softened without being decomposed. The cement is mixed with the acid and the stone re-constituted to its original condition. It can be used perfectly in any weather, even in the most severe frost. It is quite impervious to all atmospheric attacks, and can be made to match the colour of any stone." The specimen forwarded to us seems of a very compact texture, and has a hard metallic ring, which promises well.

PROVINCIAL NEWS.

Liverpool.—The *Liverpool Daily Post* says that among the members of the Cathedral Sites Sub-Committee a strong opinion exists in favour of the St. John's Church site. The interviews which have been held with the Finance Committee of the Corporation and the St. James's Cemetery trustees with reference to the proposed acquisition of the cemetery for the purposes of a site have, we understand, revealed insurmountable difficulties in acquiring that site, and the trustees of the cemetery have come to the conclusion that they cannot entertain the proposal. The prevailing opinion, moreover, seems to be that a cathedral, to be of great practical utility, should occupy a more central position than either St. James's Mount or Kensington Fields, and that it ought to be within easy reach of the common centres of the city,—the Exchange and St. George's Hall,—always bearing in mind the fact that a cathedral is a diocesan and not merely a city church, and that the convenience of the whole of the surrounding towns and suburbs has to be consulted.

Bradford.—The umpire, Mr. Struge, in the recent arbitration as to the price to be paid by the Midland Railway Company for property at the bottom of Kirkgate, Bradford, has given his decision. The property consists of two shops,—a fishmonger's and a chemist's,—and on behalf of the owners a claim for 6,608*l.* was made, and the railway company (who require it for the purposes of the new station) offered 3,740*l.* The award is for the sum of 4,800*l.*

Leyland.—An important stage has now been reached in the progress of the new waterworks for the Leyland Local Board,—at the pumping-station, Cloughton Green, near Chorley,—in the completion of the heading from the main well to the borehole, and in connecting same to the borehole, thus enabling the water to flow from the borehole into the main well. The borehole is 14 in. in diameter, and the water in it stands constantly at 20 ft. from the surface, the heading from the main well to it being driven through a mixed strata at a depth of 70 ft. below the surface. It therefore required great care and special management in order to effect a satisfactory connexion with the bore-hole. The contractor (Mr. Ebenezer Timmins, of Runcorn) has had two powerful pumps at work for a considerable time, one pump being fixed down the bore-hole, and the other in the main well. These pumps, however, were found at a late stage of the work to be quite inadequate in keeping down the water, and a fortnight ago it was considered necessary to bring into use, in addition, the two new permanent pumps belonging to the local board. There is every reason for believing, from the severe test which has just been made in pumping, and also previously, that an abundant yield of water has been obtained. Mr. Wrennall, the engineer, went down to finally inspect the connexion after completion. Mr. Joseph Clayton, of Soho Foundry, Preston, is the contractor for the new pumping machinery. The whole of the works are now rapidly approaching completion; the large reservoir, built by Mr. William Crook, of Chorley, has been charged and tested, and is now supplying the district with water. The water mains also have been tested, the head of water varying from 150 ft. to 250 ft., and they are nearly 10 miles in length, and not a single leak has been found. The pipes were supplied by the Staveley Iron Company, and the contractor for pipe-laying was Mr. Edward Dacher, of Preston.

Edinburgh.—Edinburgh's Major's patent low-pressure hydraulic multiplying lifts, manufactured by Messrs. Archibald Smith & Stevens, Janus Works, Queen's-road, Battersea, have just been erected at the Scotch Conservative Club, Edinburgh, the new hotel in Prince's-street, Edinburgh, and at the Marquis of Bute's new mansion, Mount Stuart, Rothesay, N.B. The water for driving the two first lifts above mentioned is taken direct from the town mains, in the latter case from the hills at the back of the mansion.

Alfreton.—The committee for the Alfreton district of the Belper Rural Sanitary Authority has had before it a report, prepared by Mr. Edward Pritchard, C.E., on the question as to the construction of a sewage scheme to embrace the entire neighbourhood. Mr. Pritchard is of opinion that from 8,500*l.* to 9,000*l.* will cover the cost of such works as he proposes, excepting the purchase of land or the right of easement.

Lancaster.—The Palatine Hall has been reopened, after reconstruction from the designs and under the direction of Mr. Geo. D. Oliver,

of Carlisle. The builder's work was executed by Mr. Lancaster, the joiner's work by Mr. Jno. Greene, the painting by Mr. Meadowcroft, the slating and plastering by Messrs. Hall & Son, and the plumber and glazier's work by Mr. Abbot, all of Lancaster. The gasfittings were supplied by Messrs. Richardson, Ellison, & Co., of Coventry; and the ironwork by the Phoenix Foundry Company, Lancaster, and Messrs. Macfarlane, of Glasgow.

Tiverton.—The new Volunteer Drill-hall here has been opened. The site, has a good frontage on Newport-street, running back to a depth of 180 ft. The plans, prepared by Mr. Mitchell, of Southampton, include a drill-hall, armoury, and dwelling-house for the sergeant-instructor. The tender of Messrs. Manning & Deering, of Tiverton, amounting to 1,572*l.*, was accepted for the construction of the buildings. Additions subsequently made to the original designs will increase the cost to 2,000*l.*, making the total outlay (including site) about 3,000*l.* The hall is 80 ft. by 50 ft., by 40 ft. high to the apex of the roof. The ceiling is match-boarded and varnished, and the large principals which support the roof (tied with iron bars) are partly visible, and fixed into the side walls, and supported by Portland stone corbels. The walls are of Westleigh stone, pointed externally, and plastered on the inside. When used for public meetings, concerts, &c., the hall will seat 1,250 persons.

Cambridge.—The memorial stone of a Good Templars' Mission Hall in Victoria-street, Cambridge, has been laid. The cost of the building will be from 300*l.* to 400*l.* It will be in the Gothic style, built of red Suffolk brick, with Bath stone dressings, traceried windows, and open-timbered roof, covered with slate. Mr. Henry George Bishop, Cambridge, is the architect, and Messrs. Kerridge and Shaw are the builders.

CHURCH BUILDING NEWS.

Warwick.—On the 3rd inst. a meeting of parishioners and others was held in the vestry of St. Mary's Church, Warwick, to receive a report from the Church Council and to take such steps as might be necessary in reference to the restoration of the edifice. The Vicar (the Rev. A. C. Irvine) remarked that evidences of decay were to be too plainly seen in the outward portions of the structure, and it was at the request of the Church Council that he communicated at length with the eminent architect, Mr. Butterfield. After considerable discussion it was resolved:—"That Mr. Butterfield's scheme, as modified, excluding alterations to the chancel and chancel arch, but including the alteration of the seats against the north and south walls, the repairing and warming of the interior, be adopted, it being understood that, with the exception of the alteration of the pews in the south aisles and the warming of the church the exterior repairs shall be first completed."

St. Helens.—The parish of St. Helens is being provided with a new church, which will be dedicated to St. Mark, and which will supply a long felt want in a parish containing the large population of 19,000 souls. Mr. James Gandy is the architect for the structure, which will cost 4,980*l.* and contain 700 sittings. Colonel Gamble, J.P., has presented the site.

Exeter.—A handsome memorial pulpit has just been erected in St. Michael and All Angels' Church, Exeter. It has been placed on the south side, immediately west of the central lantern, and is larger than the usual run of pulpits. Octagonal in plan, it is made wholly of well-seasoned English oak grown in the New Forest, and is in the early English style of architecture, the type of work, indeed, being similar to the detail seen in Salisbury Cathedral. There is an intersected square base, from which rise twelve columns, connected together by cusped arches. These carry the cornice, enriched by characteristic ball-flower ornaments, upon which rests the pulpit proper. This is panelled in its lower parts, and bursts into rich pierced arcading above, each cant forming a triple opening. The cornice is carved and embattled, and there is a good deal of quiet, unobtrusive carved ornament scattered about the pulpit generally. At every angle are panelled buttresses, and the interior is approached by an easy flight of four steps, supported by handsome newels. This addition to the church is the gift of Mr. Gibbs, of Tynesfeld, near Bristol, and is a memorial of her late husband, the muni-

ficent founder of St. Michael's. It has been especially designed by Mr. Arthur W. Blomfield, M.A., architect, of Montagu-square, and the work has been carefully carried out by Mr. Harry Hems, of Exeter.

Port St. Mary (Isle of Man).—St. Mary's Church, at Port St. Mary, in the parish of Rushen, has lately been consecrated. The church, which seats 300 persons, has cost about 1,500*l.*, and has been erected from the designs of Messrs. T. D. Barry & Son, architects, Liverpool, Mr. Flaxney Stowell, being the contractor.

STAINED GLASS.

Newbury.—A window to commemorate the celebrated "Jack of Newbury" has been dedicated in St. Nicholas Church, Newbury, and is to be known as the Wincombe Memorial Window. "Jack," whose correct name was John Smalwode, and whose native place was Wincombe, in Gloucestershire, built the chief part of the church about temp. Henry VIII. The window is by Messrs. Hardman & Co., of Birmingham and London.

Old Cumnock (Galloway).—The two figures which the Marquess of Bute some time since commissioned Mr. N. Westlake to paint, have been completed and fixed. One represents the Madonna and Child, the other St. John. The Madonna is standing, holding above her the Infant Saviour. St. John is represented as described by Saint Gertrude, officiating as deacon in the heavenly Mass.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Feb. 23.—4,124, J. Hartill, Dudley, Drying Walls. —4,128, C. Hill, Heywood, and G. H. Wilkes, West Bromwich, Gully-trap.—4,147, J. J. Day and T. J. Day, London, Flushing Water-closets, &c.—4,164, H. Tosh, Glasgow, and S. Preston, Barnhead, Window-sashes, &c.

March 1.—4,176, W. R. Cornell, Grays, Concrete for Building, &c.—4,203, T. G. Dorning, Manchester, Chimney-cowls.—4,218, T. Smith and J. Drewitt, London, Fastenings for Window-sashes, &c.—4,231, H. N. Cresslin, Richmond, Fittings for Water-closets Doors, &c.

March 3.—4,247, E. Potts, Oldham, Fireproof Construction.—4,257, E. G. Wright, Portsmouth, Prevention of Smoky Chimneys.—4,277, J. Smith, Leeds, Fire-grates or Stoves.—4,278, W. Telfer, Kington Park, Cooking-ranges.—4,286, F. J. Candy, Fen Ditton, Lavatories and Closets.

March 4.—4,306, A. Emanuel, London, Water-closet.—4,320, J. Whitely, Salford, Mats, Treads of Staircases, &c.—4,347, G. Pelling, London, Window-sashes.—4,354, W. Watson, London, Sash-fasteners.—4,360, J. D. Mackenzie and W. Atkinson, London, Glazing Roofs, &c.—4,374, E. Edwards, London, Metal Roofs. Com. by A. A. J. Menant and P. H. J. Menant, Paris.

March 5.—4,408, T. Walton, London, Decorising Focal Matters, &c., in Water-closets, &c.—4,405, G. C. Warden, Tyne-mouth, and J. Ferguson, Edinburgh, Sash-bars and Astragals.—4,418, T. Penn, London, Preventing Waste of Water.

March 6.—4,438, J. Miller, Glasgow, Ventilating Syphon-traps for Drains, &c.—4,441, W. G. de F. Garland, East Molesey, Fences.

SPECIFICATIONS ACCEPTED.†

March 4.—105, J. Robson, London, Weathering Parapet Walls, &c.—1,807, J. Partridge, London, Window-blind Fittings.

March 7.—2,446, J. Badger, New York, U.S.A., Window Ventilators.—2,496, R. Crosthwaite, London, Fire-grates or Stoves.—2,601, H. O. A. E. Gruenbaum, London, Ventilation and Purification of Vitiated Air in Dwellings, &c.

NOTICES TO PROCEED

Have been given on the Dates first named.

March 4.—5,167, E. E. Allen, London, Construction of Portable Buildings (Oct. 31, '83).—5,211, C. W. von Nawrocki, Berlin, Floors, Thresholds, Steps, &c. Com. by F. Arnecke & Co., Blankenburg, Germany. (Nov. 2, '83).—5,385, W. Walker, Birkenhead, Exhaust Ventilators (Nov. 15, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending March 9, 1884.

2,303, S. C. Overton, London, Producing Mural Ceiling, and other Architectural Decorations (May 7, '83, price 4*d.*).

A composition is made of paper or wood pulp, asbestos powder, and silicic acid, which is pressed into the shape required.

3,344, A. J. Boulton, London, Ventilating Casements. Com. by MM. Bouquet & Baile, Besançon, France (July 5, '83, 2*d.*).

These casements have rows of movable flaps or strips of glass. (Pro. Fro.)

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

3,366, W. R. Lake, London, Door-locks. Com. by E. A. Chamero, Paris (July 6, '83, 2d.).

This relates to supplying cheap common locks, with movable wards to render them more secure. (*Pro. Pro.*)

3,469, H. J. Hadden, London, Cord-fastener for Window-blinds, &c. Com. by D. W. Ernsting, Bremen (July 13, '83, 4d.).

The cord is passed between two levers pivoted on a bracket, and when this cord is pulled sideways these levers grip the cord.

3,489, J. Fairbairn, Edinburgh, Water-closets (July 16, '83, 6d.).

The basin of the closet has a syphon-trap or water-seal, and another is fitted to the discharge pipe below; but air-pipes are fitted to each trap to prevent syphonic action. The discharge-pipe from the cistern is also trapped.

3,512, E. Gilbert and A. E. Gilbert, Dundee, Water-closets (July 17, '83, 6d.).

The basin may be made in any manner, but the seat, which is quite separate therefrom, is made in the form of a horseshoe and is hinged to the wall, &c., at the back.

3,555, C. J. Marson, London, Slabs for Building or Decorative Purposes (July 19, '83, 2d.).

These are made of plaster, Portland cement, siliceous sand, and borax, which, when mixed together, are moulded into the shape required. (*Pro. Pro.*)

3,614, J. Heinemann, Hanover, Artificial Marble. Com. by H. Rolke, Hanover (July 23, '83, 4d.).

This is made of gypsum, which is first heated and then treated with solutions of chloride of calcium and sulphate of magnesia.

MEETINGS.

SATURDAY, MARCH 15.

Royal Institution.—Captain Abney, R.E., F.R.S., on "Photographic Action Considered as the Work of Radiation." (III.) 3 p.m.

MONDAY, MARCH 17.

Society of Arts—Professor W. Chandler Roberts, F.R.S., on "The Alloys used for Coinage." (Cantor Lecture). 9 p.m.

TUESDAY, MARCH 18.

Institution of Civil Engineers.—Mr. James A. Longridge, M.Inst.C.E., on "Wire-gun Construction." 8 p.m.

St. Paul's Ecological Society.—Mr. W. de Gray Birch on "Seals, with reference to those of some Bishops of London." 7.30 p.m.

Society of Arts (Foreign and Colonial Section).—Mr. B. Francis Cobb on "Borneo." 8 p.m.

WEDNESDAY, MARCH 19.

British Archaeological Association.—Mr. Thos. Morgan, F.S.A., on "The Evidence and Theories relative to Caesar's Landing-place." 8 p.m.

Royal Meteorological Society.—Mr. Robert H. Scott, F.R.S., on "The History of Thermometers." 7 p.m.

THURSDAY, MARCH 20.

Society of Antiquaries.—(1) The Rev Canon Pownall, F.S.A., on "A Reliquary of Limoges Enamel (thirteenth century)." (2) Mr. A. J. Evans, F.S.A., on "Researches in Illyricum: Scopi and the Birthplace of Justinian." 8.30 p.m.

Institution of Civil Engineers (Special Meeting).—Mr. A. C. Kirk, M.Inst.C.E., on "Compressed Air and other Refrigerating Machinery." 8 p.m.

Society of Engineers.—Mr. J. W. Wilson, jun., on "Open Pier Construction." 7.30 p.m.

Royal Institution. Professor Tyndall on "The Older Electricity; its Phenomena and Investigators." (IV.) 3 p.m.

FRIDAY, MARCH 21.

Royal Institution.—Mr. Walter Besant on "The Art of Fiction." 9 p.m.

SATURDAY, MARCH 22.

Architectural Association.—Visit to the Scottish National Church, Pont-street, Belgravia. 3 p.m.

Miscellaneous.

General Engineering Construction.—

The fourth of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, Principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of March 6th, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Charles Horsley, past-president, in the chair. The lecturer commenced by considering the nature and position of prime movers, of travellers and lifting gear, shafting and couplings, &c. He then spoke of the different processes of setting out work, and the various appliances connected therewith, and went on to describe the different kinds of machine tools, lathes, &c., showing how they have been improved in construction from time to time. After that, he directed the attention of his audience to the general process of preparing wrought-ironwork, and to the different forms of apparatus in use for that purpose, including the various kinds of hammers and the arrangement of forges. The lecturer concluded with a special reference to some of the large work carried out in forges in the present day. The lecture was illustrated by numerous models and diagrams.

Grecian Art and the Olympian Games.—

On this subject Mr. W. Cave Thomas is to read a paper before the Gynmadorion Society next week.

Finchley Sewerage.—The Finchley Local Board, being impressed with the necessity of sewerage for their district, the ditches and streams of which are now polluted by sewage, in April, 1883, instructed their engineer and surveyor, Mr. George W. Brumell, C.E., to prepare a sewerage scheme for their district, the sewage to be disposed of by filtration on twenty-eight acres of land at Colney Hatch. The scheme prepared is estimated to cost 46,000*l.*, exclusive of land. The Finchley Board, having considered this scheme, and adopted it, petitioned the Local Government Board for a provisional order to take lands by compulsory powers for the erection of pumping stations, and also for permission to borrow 14,500*l.* to purchase land by agreement. Mr. S. J. Smith, Local Government Inspector has been holding an inquiry (which has already extended over four days) into the merits of the undertaking. Evidence upon the scheme has been given by Mr. Brumell. Mr. H. Law, C.E. (who had been consulted by the Finchley Board) gave evidence in support of the application, and said that the fears of the opposition as to any nuisance being caused by the pumping-station adjoining Hendon were groundless and purely sentimental. He had had his office in a large pumping station at Pernambuco, Brazil, and there was no smell, no noise, and no nuisance whatever; he also described the Western Pumping Station of the Metropolitan Board of Works at Pimlico, and stated that the general impression in the neighbourhood is that it is a pumping-station for waterworks (!). No complaints had ever been received. With proper management there need not be the slightest apprehension of any nuisance at the proposed pumping-station adjoining Hendon, especially as gas engines were to be used. The inquiry was ultimately adjourned to the 18th inst. when the Hendon Local Board and some Hendon ratepayers intend by counsel to open the case of the opposition.

The Ruthven Collection of Greek Antiquities, Edinburgh.—The National Museum of Antiquities in the Royal Institution, Edinburgh, has lately received as a gift from Lady Ruthven an extensive and valuable collection of Greek antiquities which has long been preserved at Winton Castle. The collection consists chiefly of Greek vases, terra-cottas, lamps, bronzes, and coins. The bronzes include a number of mirrors of early Greek type, and a considerable variety of small statuettes and figures of animals from Greece and Italy, with portions of several specimens of large sepulchral vases of bronze of archaic character. The terra-cottas are, for the most part, archaic in type, including a number of painted figures of horses and other animals, presenting a suggestive resemblance to some of those recovered from the excavations at Mycenae and the ruins in the Troad by Dr. Schliemann. The vases, which form the largest portion of the collection, are about 500 in number, some being of large size, and many of great beauty and rarity. This typical series of painted vases is described by the *Scotsman* as being second in importance and interest only to that of the British Museum itself.

Royal Commission on the Housing of the Working Classes.—The Royal Commission on the Housing of the Working Classes held their first meeting for the examination of witnesses on Tuesday at 8, Richmond-terrace, Whitehall. Present:—Sir Charles Dilke, M.P. (chairman), the Prince of Wales, Cardinal Manning, the Marquis of Salisbury, Lord Brownlow, Lord Carrington, Mr. Goschen, M.P., Sir R. A. Cross, M.P., the Bishop of Bedford, the Hon. E. L. Stanley, M.P., Mr. Torrens, M.P., Mr. Broadhurst, M.P., Mr. Collings, M.P., Mr. Godwin, F.R.S., Mr. S. Morley, M.P., and Mr. J. E. C. Bodley, secretary. It was resolved, after some discussion, to hold the sittings in private. Evidence was given by Lord Shaftesbury and Mr. Hugh Owen, permanent secretary to the Local Government Board, and after a sitting of several hours the Commission adjourned until Friday.

The Parkes Museum.—Among the members elected at the last meeting of the Council of the Parkes Museum were Sir William Bowman, bart., F.R.S.; the Hon. Sir John Rose, bart., G.C.M.G.; Sir Henry B. Loch, K.C.B.; Sir Frederick Abel, C.B.; Mr. J. Bonham Carter, Surgeon-General James Moutat, V.C., C.B.; Professor H. E. Armstrong, F.R.S.; Major H. B. Hamilton; Dr. S. O. Habershon; Mr. W. Emerson, F.R.I.B.A.; Mr. J. Cooper Porter, F.R.C.S.; Stephen Salter, F.R.I.B.A.; Dr. John Williams; Mr. Morratt Baker, F.R.C.S.; Mr. Thomas Bryant, F.R.C.S.

Building Land in Whitecross-street and Shoreditch.—Messrs. Walker & Runtz recently submitted for sale at the Auction Mart, a number of extensive freehold building sites in the localities of Whitecross-street and Shoreditch. The sale took place by direction of the Metropolitan Board of Works, the particulars stating that the lands comprised in the several lots had been acquired by the Board under the powers conferred upon them by the Artisans' and Labourers' Dwellings Improvement Acts, but that the lots now submitted were those portions acquired by the Board which were not, under the terms of the Acts, required to be laid into any street, or devoted to the erection of dwellings for the working classes. The property first submitted consisted of the sites in the neighbourhood of Whitecross-street, containing nine lots. A plot at the corner of Bunhill-row and Duffett-street, containing 2,213 square feet, was sold for 3,320*l.* The next lot offered, situated near Bunhill-row, contained an area of 7,523 ft., having a frontage to Duffett-street of 95 ft., to Errol-street of 66 ft., with an average depth of about 75 ft. For this lot there was close and spirited competition, the first offer being 4,000*l.*, the subsequent biddings quickly bringing the property up to 8,000*l.*, at which it was withdrawn. With the exception of one small lot, the remaining lots were all sold, after an animated competition for each, the total proceeds of the several lots sold amounting to 22,790*l.* The Shoreditch property, consisting of five lots, was next offered, and all readily sold at the following prices:—High-street, a freehold building site, area 3,600 ft., 3,510*l.*; another site, area, 1,848 ft., 2,440*l.*; an adjoining site, area 1,507 ft., 1,750*l.*; another adjoining site, area 6,627 ft., 4,560*l.*; and a site in Great Eastern-street, area 5,693 ft., 6,200*l.*; total for the five sites 18,460*l.* Thus the aggregate proceeds of the day's sale amounted to 41,250*l.*

The Recreation and Health Society, Brighton.—The first annual report of this society, adopted at the meeting held the other day, puts on record a great deal of useful work in the way of "uniting and organising voluntary efforts for the improvement of the moral and physical condition of the people." The sanitary sub-committee seem to have given a great deal of time and attention to the condition of many of the poorer districts of the town, and have personally inspected, and reported upon some of them to the town council. The committee believe that by thus co-operating with the sanitary authorities, good has been done, and the hands of the town officials have been strengthened in bringing pressure to bear upon negligent owners of property. A special series of questions for the use of district visitors has been prepared, by which they should be able to ascertain the existence of any serious sanitary defect in houses they visit; these are in process of circulation. The work done by the decoration sub-committee has been of an unpretentious character. For the sake of colour, the walls of the St. Mary's schoolroom in Mount-street, in the poor neighbourhood of Edward-street, have been brightened by a border above the wooden dado, formed by the coloured plate from several of Randolph Caldecott's picture-books, mounted upon artist's cloth, and with an ornamental border painted round each set. A number of coloured prints and good steel engravings, kindly given to the society by Mr. G. W. Ryde, have been distributed.

Knighton Workhouse, Radnorshire.—The Guardians having advertised in the *Builder* for designs for a new stone-built workhouse for 120 inmates, received nine designs in answer to it. They met on the 28th ult., and selected the plans of Messrs. Jones & Parke, Newtown, Montgomeryshire, and commissioned them to carry out the work. The second premium of 10*l.* was awarded to Messrs. Blessey & Aspinall, Cardiff. The conditions stipulated that two blocks of the old workhouse should be worked in with the new. The site is a narrow strip running north and south, and falls about 36 ft. from south to north, so that it is rather an awkward site to deal with. The adopted plan resembles the letter H, with the men and women on the sides, the administrative offices in the centre, the dining-room projecting from the centre at the back, with the kitchen and other offices running across at the end of the dining-room. Taking advantage of the fall in the ground, tramp wards can be formed under the centre and wings if desired. The cost will be about 5,000*l.*

New Reservoir at Stroud.—The new reservoir at Stroud has been completed. The Board have constructed the reservoir with their own workmen, without the aid of a contractor. The site of the reservoir was an old quarry, and the labour of forming and clearing the floor to the required level was a work of considerable difficulty, the total quantity of rock and debris requiring to be moved being about 14,000 tons. The side walls and floor of the reservoir have been constructed entirely of concrete, and the roof, which consists of brick and concrete arches carried on iron girders, is supported by seventy-three brick pillars. The whole of the floor and side walls have been finished with cement rendering 1½ in. in thickness. The capacity of the reservoir is about 2,100,000 gallons, and the cost amounts to 11. 15s. per 1,000 gallons, the area being about half an acre. The materials used in the construction of the reservoir have been supplied by the following manufacturers and tradesmen:—Cement: Mr. T. P. Powell, Wareham, Isle of Purbeck, and Messrs. Gibbs & Co., Greys, Essex. Lias lime: Messrs. J. Davies & Co., Abertawe Limestone Works, Llanwerry; Messrs. Greaves, Bull, & Lakin, Stockton, Warwick; Mr. F. Bromwich, Keysham. Bricks: Messrs. H. & A. Pearce, Dudbridge; Mr. W. W. H. Harper, Stroud; Mr. Wood, Stroud; Messrs. Butt & Son, Stroud. Constructional ironwork: Messrs. Rowson, Drew, & Co., London; Messrs. Chew & Sons, Stroud; Messrs. M. T. Shaw & Co., London; Messrs. Hill & Sons, Stroud; Mr. F. G. Gill, Stroud. Valves and fittings: Messrs. J. Stone & Co., Deptford. Iron pipes: Messrs. J. & S. Roberts, Swan Village. The cement plastering has been done by Mr. H. Beavis, Stroud. The work has been executed from the plans and under the superintendence of Mr. Lofthouse, C.E., the Town Surveyor and Water Engineer.

Shepton Mallet.—At a meeting of the Local Board of Health, on Wednesday, the 5th "the Medical Officer stated that up to the previous day the company's water had been in a drinkable condition, but on Tuesday and Wednesday he found the water to be in turbid condition. He had not tested the water, but he believed it to be pure, except when contaminated by surface water. Mr. Hickes thought that the Board should have the water analysed. The Chairman: It is suggested that a communication should go to the water company, asking them to do so. Mr. Hickes: I like that. That's letting the company be their own judges. Mr. Allen: How can that be? We should not make the water ourselves. Mr. Norton said there were some pipes broken, and in consequence of the heavy rains it had been impossible to complete the work. Some time ago a complaint was made by Mr. Herring, and upon the water being analysed it was found to be pure, with the exception of the discolouring matter which got into the water in consequence of some pipes being broken. The Chairman: The question is, whether the discolouring matter contains anything injurious to health. Mr. Luff moved that the Clerk should write to the water company, asking them to have the water tested by the public analyst." It appears that the engineer under whom the work alluded to was carried out has accepted little more than one-fourth of his original charges, in full settlement: so we hope that, as war correspondents say, "tranquillity is restored."

British Archaeological Association.—The seventh meeting of the session was held on the 5th inst., the chair being occupied by Mr. Thomas Morgan, F.S.A. Mr. Roach Smith, F.S.A., reported the discovery of a Saxon cemetery in Dartford parish, not far from the new building of the Asylum Board. One interment has been met with, supposed to be that of a warrior, since the iron unbo of a shield and a javelin head were found. Mr. Loftus Brock, F.S.A., exhibited a funeral chaplet of very thin gold, found in the grave of a Greek lady in the Troad, similar but later in date to those discovered by Dr. Schliemann. Mr. Mac Intyre North described several articles of Celtic art figured in his recent work, and the chairman referred to some recent discoveries on the site of the Colossus of Rhodes, and stated that some of the massive foundations are still extant. A paper was then read by Mr. W. de Gray Birch, F.S.A., in the absence of its author, Mr. H. Syer Cuming, F.S.A. Scott, on "Finger-nail Lore." The paper was illustrated by extracts from a large number of old authors.

The New Assize Courts in Shrewsbury. The Shropshire Winter Assizes were held last month in the new Assize Courts at Shrewsbury, recently completed, at a cost of about 25,000l., from the designs of Mr. Thomas M. Lockwood, architect, Chester. Baron Huddleston, in the course of his charge to the Grand Jury, made a long and complimentary reference to the new courts, saying he thought they might fairly challenge all the other counties in England to produce more commodious or more convenient courts than those in which they were then sitting. A great deal of the public mind had been occupied with the subject of courts of justice, and suggestions of various kinds had been made, directed, he thought, in reference to the arrangements of new courts. There were two things in the arrangement of a court that ought to receive due attention, one being that of proper accommodation for the jury, and the other proper accommodation for the witnesses, which matters had hitherto been too much neglected.

Electrical Engineering.—The final lecture of this series was delivered by Mr. John C. Fell, in the reading-rooms of the Society of Engineers, Westminster Chambers, on Monday evening, March 10th, Mr. Arthur Rigg, president, in the chair. The lecturer concluded this series by an explanation of the nature and action of secondary batteries. He pointed out their most valuable functions for the regulation and storage of the electrical current in any case of electric-light installation, the steady supply of a uniform current being thereby insured, and the danger of sudden darkness from the stoppage of the generator thereby obviated. Mr. Fell concluded with an account of some novel results in thermo-electricity.

The Royal Commission on Dwellings. It will not fail to be noted as a significant fact that no medical man has been placed on the Royal Commission appointed to investigate the condition of the dwellings of the poor. Mr. George Godwin, the architect, represents the building profession; but it has not been deemed necessary that the profession of medicine, or health-preservation, should be represented, although the prevention of disease is one of the crying needs of the evil to be investigated.—*Lancet.*

TENDERS.

For enlargement of school at Webb-street, Southwark, for the School Board for London. Mr. E. B. Robson, architect:—

Faulkner.....	£4,313	0	0
Wood.....	4,193	0	0
Hart.....	4,072	0	0
Staines.....	3,996	0	0
Johnson.....	3,826	0	0
Tongue.....	3,803	0	0
Patman & Rotheringham.....	3,789	0	0
Kirk & Randall.....	3,750	0	0
Brass.....	3,735	0	0
Bangs.....	3,730	0	0
Turtle.....	3,728	0	0
Niblett.....	3,718	0	0
Smith.....	3,707	0	0
Shurman.....	3,684	0	0
Devard.....	3,680	0	0
Holloway.....	3,677	0	0
Atherton & Latta.....	3,650	0	0
Scrivener.....	3,644	0	0
Lathey Bros.....	3,634	0	0
Grover.....	3,628	0	0
Jackson.....	3,620	0	0
Dowds.....	3,620	0	0
Shepherd.....	3,605	0	0
Wall Bros.....	3,587	0	0
Stimpson.....	3,450	0	0
Howell & Son.....	3,462	0	0

For sewerage, levelling, kerbing, metalling, constructing manholes and lamp-holes, and making a road on an estate at Walthamstow, Essex, for Mr. Charles Raikes, Mr. Francis W. Searle, surveyor, Tottenham:—

P. G. Pound.....	£1,395	0	0
C. Killingsback.....	1,320	0	0
C. Taylor.....	1,190	0	0
J. E. Bloomfield.....	1,122	0	0
H. Potter.....	1,049	0	0
W. Porter.....	993	0	0

For six cottages for Mr. Appleton, Solihull, Essex.

Mr. W. F. Good, architect.....	£597	0	0
Cockett.....	589	0	0
Rudrum.....	578	0	0
Dupont.....	565	0	0
Bowls.....	541	0	0
Harden.....	541	0	0
Dobson.....	792	0	0
Chambers.....	769	0	0
Oldridge, Colchester (accepted).....	764	10	0

For the erection of residence, Addison-gardens, Kensington, W., for Mr. Thos. H. Ellis. Mr. Thos. S. Stephens, architect (Messrs. Graham & Co., 67, Strand, W.C.):—

Building, Decoration.....	£1,100	0	0
Ellis & Turner (accepted).....	1,100	0	0

For a new aisle and other extensions to St. Botolph's Church, Lincoln. Mr. Wm. Watkins, architect.

Quantities supplied:—			
Hampshire.....	£254	0	0
Martin & Sims.....	638	0	0
Footet.....	599	10	0
Baines.....	584	0	0
Crosby & Sons (accepted conditionally).....	546	0	0

Accepted for proposed billiard-room at The Times, Newbury, Berkshire, for Mr. J. Cockburn Fininger, Mr. James H. Money, architect, The Broadway, Newbury.

Quantities supplied by Messrs. Curtis & Sons:—			
Adey (general work).....	£445	0	0
Pound (mason).....	115	0	0
Bryer & Co. (plumbing, painting, &c.).....	78	0	0

For alterations and additions to the Croft, Lytton-grove, Putney Hill, Surrey, for the Hon. Baron C. E. Pollock. Messrs. Lee Bros. & Pain, architects, 5, Adelphi-terrace. Quantities supplied:—

H. Bishop.....	£1,286	0	0
S. W. Aries (accepted).....	1,252	0	0

For constructing roads and sewers upon the estate of Mr. R. J. Pettward, at Putney. Messrs. Lee Bros. & Pain, surveyors. Quantities supplied:—

S. W. Aries.....	£6,832	0	0
J. Neal.....	5,668	0	0
P. Blackmore.....	5,435	0	0
R. Aries & Co. (accepted).....	5,444	0	0

For the erection of detached dwelling-house and stabling for six boxes at West Ham, for Mr. Wm. Laver:—

House, Stables.....			
Cheffins.....	£270	0	0
Hosking.....	639	0	0
Brown & Roberts.....	325	0	0

For the erection of vicarage and stables at Felinfol, near Llanelli. Mr. J. Buckley Wilson, architect, 16, Castle-street, Swansea. No quantities supplied:—

J. Davies, Llanelli.....	£2,200	0	0
Bassett, Davies, & Hopkins, Llanelli.....	2,102	0	0
D. Perceigne, Felinfol.....	2,100	13	0
Brown, Thomas, & Johns, Llanelli.....	2,098	0	0
Thomas, Watkins, & Jenkins, Swansea.....	2,000	0	0
G. Mercer, Llanelli.....	1,978	0	0
J. Thomas, Llanelli.....	1,970	0	0

For alterations to Board school, Wollaston. Mr. E. Sharman, architect:—

E. Brown, Wollaston.....	£498	0	0
R. Marriott, Wellingborough.....	490	0	0
Clayton & Sharman, Wellingborough.....	467	10	0
G. Henon, Wellingborough.....	438	0	0
Coopers, Wollaston.....	431	0	0
J. Underwood, Wellingborough.....	433	0	0

For pulling down and erecting new premises, 3 and 4, George-yard, Bow-lane, for Mr. Mock. Mr. F. I. Chambers, architect. Quantities not supplied:—

Lidstone & Son.....	£225	0	0
D. D. & A. Brown.....	789	0	0
Mattock Bros.....	627	0	0

For erecting new depot for Messrs. Carter, Patterson, & Co., at Dyne-road, Kiburn Rise. Mr. W. E. E. architect.

Quantities supplied:—

Roe.....	£4,394	0	0
Harris & Wardrop.....	4,243	0	0
D. D. & A. Brown.....	4,145	0	0
Downs.....	4,143	0	0
Nile.....	4,108	0	0
Hicks.....	3,940	0	0
Rogers.....	3,157	0	0

For gasfitters' work at Finsbury Park Congregational Church, Messrs. Searle & Searle, architects, 4, Bloomsbury-place, W.C.:—

Brass Fittings. Iron and Brass.			
Biggs.....	£213	6	3
Y. Vaughan & Brown.....	188	0	0
Jones & Willis.....	149	10	6
* Accepted.			

For alterations and additions at Castle Bar, Hill-road, Ealing, for the Messrs. Riley. Mr. J. Wallace Peggs, architect, 21, Queen Anne's Gate, Westminster:—

D. D. & A. Brown (accepted).....	£550	0	0
[No competition.]			

For new stable and offices at "Wolverton," Beckenham, for Dr. Walker, 22, Grosvenor-street, Grosvenor-square:—

D. D. & A. Brown (accepted).....	£260	0	0
[No competition.]			

For carrying out shop-fronts at Nos. 40, 42, and 44, Southampton-street, Camberwell, for Mr. R. Flasher, West Kent Lodge, Beley Heath, Kent:—

D. D. & A. Brown (accepted).....	£250	0	0
[No competition.]			

For the erection of new warehouses in Peasod-street, Windsor, for Mr. J. Radnor:—

W. F. Beavell (accepted).....	£700	0	0
[No competition.]			

For the rebuilding of the London Luncheon Bar, Peasod-street, Windsor, for Messrs. Nicholson & Sons.

Mr. Charles Vardy, architect, Maidenhead, Berks:—			
Silver, Sons, & Tilwood, Maidenhead.....	£263	0	0
Woodbridge, Maidenhead.....	850	0	0
Hollis, Windsor.....	633	0	0
W. P. Beavell, Windsor (accepted).....	573	0	0

For pair of houses in Frances-road, Windsor:—

W. F. Beavell (accepted).....	£1,100	0	0
[No competition.]			

For alterations and additions to premises, Thames-street, Windsor, for Messrs. Burge & Co., Windsor, Mr. A. A. Hudson, architect, Southsea:—

W. P. Beavell (accepted).....	£250	0	0
[No competition.]			

For new school-rooms at the Baptist Chapel, Victoria-street, Windsor, for Building Committee:—

Kelly, Windsor.....	£395	0	0
Hollis, Windsor.....	318	0	0
W. F. Beavell, Windsor (accepted).....	348	0	0

For the completion of West Kensington Congregational Church. Mr. James Cubitt, architect. Quantities supplied:—

Bray & Pope.....	£7,611 0 0
Nightingale.....	5,583 0 0
Rider & Son.....	5,583 0 0
Shurmer.....	5,769 0 0
Kearley.....	5,197 0 0
Staines & Son.....	5,384 0 0
F. Higgs.....	5,090 0 0
J. O. Richardson.....	4,910 0 0
F. Smith.....	4,867 0 0
Larden & Son.....	4,720 0 0
D. D. & A. Brown.....	4,615 0 0
Howell & Son.....	4,616 0 0

For the erection of lawn tennis pavilion for the directors of the Chiswick Lawn-Tennis Club:—

	Without Basement.
Nightingale.....	£1,378
Hunt.....	1,418
Adams.....	1,365
Roome.....	1,361
Whitman.....	1,083

Accepted for the erection of dwelling-house and shop premises in Church-street, Camberwell, for Mr. W. H. Cooper. Mr. Robert P. Whellock, architect, Camberwell.

W. P. Reavell, Windsor..... £1,070 10 0

For the erection of packing and cart sheds, and re-laying cottages, after fire, at Nightingale Hall Farm, Lower Edmonton. Mr. J. S. Gomme, surveyor, W9, Strand:—

Sims, Richmond.....	£1,372 0 0
Kent, Edmonton (too late).....	1,179 0 0
Bentley, Waltham Abbey.....	1,134 0 0
Field & Son, Enfield.....	1,100 0 0
Gardener, Waltham Abbey.....	988 0 0
Nye, Ealing (accepted).....	919 0 0

[Surveyor's estimate, 1,089.]

For the erection of three additional houses at the School, Hastedon, Surrey, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Haxton, architects, 15, Leadenhall-street. Quantities supplied:—

Lee & Son.....	£5,192 6 0
Munday.....	4,923 16 6
Burman & Son.....	4,697 0 0
Knight.....	4,694 11 6
White.....	4,514 9 0
Potter.....	4,316 16 0
Deacon.....	4,267 0 0
Hobbs.....	4,170 0 0
Masters.....	4,138 0 0
Howell.....	4,105 0 0
F. Higgs.....	4,069 0 0
Jas. Longley, Crawley, Sussex.....	3,908 0 0

Accepted for the erection of a Wesleyan Church at South Elmstall. Mr. James Wilson, architect, Leeds. Quantities by the architect:—

Wilson (mason).....	£704 13 4
Gelder (joiner).....	330 0 0
Rawlins (slater).....	82 0 0
Tattersall (plasterer).....	56 10 1
Thompson (plumber and painter).....	78 0 0
Tankard (hot-water).....	30 2 4

For the erection of five cottages, Gold-street, Stepney-green, for Mr. Morris Davies. Mr. Charles A. Legg, architect, Mile End. Quantities by Mr. Hawker:—

Lusk.....	£1,503 0 0
Palmer & Sons.....	1,365 0 0
Finch.....	1,140 0 0
Hawkins.....	1,229 0 0
Elves.....	1,270 0 0
Parist.....	1,259 0 0
Calnan.....	1,215 0 0
Russell.....	1,202 0 0

For alterations to the Hallville Tavern, Canning Town. Mr. G. T. Tribe, architect:—

Hughes.....	£285 0 0
Shurmer.....	798 0 0
Harris & Wardrop.....	783 0 0
Walker.....	766 0 0
Buckall.....	669 0 0
Maddison.....	625 0 0

For additional warming at the High-street Board School, Stoke Newington. Mr. E. R. Robson, architect:—

W. Shurmer.....	£167 0 0
T. Boyce.....	166 0 0
McCormick & Sons.....	135 0 0

For alterations, additions, &c., to Shandon-court, Tunbridge Wells, for Major C. R. Fletcher Lutwidge, J.P. Mr. Mervyn E. Macintyre, B.A., architect. Quantities by Messrs. Evans & Deacon:—

Shillito.....	£6,977 1 10
Nansfield & Son.....	6,749 0 0
Punnett & Son.....	6,181 0 0
Maides & Harper.....	6,114 0 0
Jarrell.....	6,090 0 0
Heath.....	5,839 0 0
Oakley & Drake.....	5,652 0 0
Foster & Dicksee.....	5,325 0 0

For alterations to shop for Messrs. Routledge & Co., High-road, Lower Tottenham. Mr. D. Campbell, architect:—

Woodward.....	£232 0 0
Fairhead.....	231 0 0
Shurmer.....	216 0 0

For the erection of a billiard-room at Finchley. Mr. F. W. Littlewood, architect:—

W. Oldrey.....	£390 0 0
Smith Bros.....	532 16 0
Bray & Pope.....	520 0 0
Mattcock Bros.....	517 0 0
Stimpson & Co.....	490 0 0
Garrud.....	483 10 0
W. Shurmer.....	460 0 0
J. W. Dixon.....	433 0 0

Malvern Assembly Rooms.—In reference to the list of tenders for this work, published a fortnight ago (p. 334), Mr. John Kveral writes: "There are a few little inaccuracies which it may perhaps be well to correct, viz.:—'Wood & Sons, Malvern,' should be 'Wood & Sons, Worcester'; 'Everal & Co., Malvern,' should be 'Everal & Co., Worcester'; and 'Sparkes & Co.' should be 'Sparkes & Son.' The list was printed as sent to us.

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

Rev. W. H. L. P. R. W. & H. (we cannot undertake to keep and return rejected MSS., as we have for some time permanently indicated below)—G. & Co. (we are obliged to decline notifying honorary awards at exhibitions, and unless the information is sent officially, we cannot decide whether the subject is worth space).—F. J. C. (shall have attention).—W. W. W. L. & W. R. S. H. (sent too late to space).—A. B. G. (next week).—H. T. H. J. & Son.—A. & E. A. (should send quotation).—T. de C. M. (amounts not sent).—G. (too late).

Correspondents should address the Editor, and not the Publisher, except in cases of business. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 12, and a COLOURED TITLE-PAGE was issued the following week, in substitution for that published previously.

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PERSONS Advertising in "The Builder," may have Replies addressed to the Office, 46, Catherine-street, Covent-garden, W.C. free of Charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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"THE BUILDER" is supplied direct from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum. Prepaid. To countries within the Postal Union, 20s. per annum. Remittances payable to DOUGLAS FOURDRINER, Publisher, 46, Catherine-street, W.C.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY. The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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Whites Asphaltes.

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N.B.—For Prospectuses and Diagrams, address Stamped Envelope to P. E. CHAPPUIS, Patentee and Manufacturer, 69, FLEET-STREET, LONDON.

NOTICE.—The POLYGONAL REFLECTOR (Latest Patent) FOR ARTISTIC and PICTURE GALLERIES. Its construction allows of the reflector being readily altered so as to reflect in any desirable direction.

The Builder.

VOL. XLVI. No. 2145.

SATURDAY, MARCH 22, 1884.

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The Journal of Indian Art.

THE appearance of the new quarterly *Journal of Indian Art*, of which the two first numbers, for January and April of this year, are now before us, means something more than a mere addition, good or bad, to our list of illustrated artistic periodicals. It is the outcome of the peculiar position in which English government and Indian art are now placed in relation to each other. Following what seems to be the inevitable law wherever European influence intrudes on Eastern nations (a significant fact which it is useless for art enthusiasts to close their eyes to), the native art of

India seems in danger of being hopelessly deteriorated, and even finally disappearing, through the efforts of the misguided native to imitate European art and fall in with European ideas. In the official notice appended to the first number of the *Journal of Indian Art* it is observed that, when a system of cataloguing and collecting examples of practical native industries was set on foot, it was at the same time felt that a larger question was raised in regard to artistic industries. "Could any effort be made to check the deterioration which is so clearly visible in many of these handicrafts? Against interference might be urged the danger of destroying the traditional skill and sense of beauty which the humblest Indian artificer often seems to possess. On behalf of interference were the obvious facts that Indian art is already being led into new paths to meet European tastes and requirements; that it imitates with little or no discrimination; and that it readily follows ignorant guidance. The evidence on the whole seemed in favour of some interference, if it could be exercised with discretion and without injury to trade." These considerations led to a "draft scheme for the promotion of industrial arts in India," a copy of which was also circulated with the first number of the journal. It provides for the formation of a Local Committee in any district in which an industrial art of special character

is carried on, which committee is to examine the conditions under which the industrial art is conducted; to examine the specimens and select the best as "approved examples"; to form a local museum for the deposit of such examples; to encourage the industrial art by the establishment of schools, the supply of patterns, by exhibitions with prizes contingent thereto, and by establishing an agency for the supply of "duplicates of approved examples" to provincial committees. "In each province there will be appointed a Provincial Committee, of which the officer in charge of the Agricultural Department" ("Why this?" as Malvolio says) "and the officer in charge of the school of art (if there be one in the province) shall be *ex officio* president and secretary respectively." The provincial committee is to form a collection of provincial exhibits at the museum at the head quarters of the province, and to select approved specimens from the local museums for permanent deposit at the provincial museum, to advise and control the action of local committees, and to contribute a section each year to the *Journal of Indian Arts and Industries*. Collections of approved examples from all provinces of India will be made at Madras, Bombay, and Calcutta: these will be termed the Presidency Collections.

In other words, India, *en masse*, is to be *South Kensingtonised*.

That is what it comes to, if put in the plainest and most succinct manner. That the plan has been formed with the best intentions we do not question, nor do we deny that the scheme presents an admirably coherent and symmetrical administrative machinery. We can see, in imagination, the "approved example," painfully elaborated by Ram Shasti under the advice of the local committee, working its way up, in a series of "duplicate examples," to the provincial and finally to the three Presidency museums, there to be ticketed and labelled as an illustration of Indian art reformed on true principles, under the fostering care of a paternal Government. The machinery, as we said, appears most complete. The trifling question only remains to be asked, how do the Indian Government propose to revive the spirit which once burned spontaneously in Indian art, and which "the breath of these Saxons and Celts" seems to have nearly blown out? Make committees, agricultural presidents, art secretaries, and museums for "approved examples," as you please; but, as Chaucer sang,—

"Love will not be constrained by maisterie;"

it is even so with art, which is a kind of love,—the love of what you are doing, and the desire to put your enjoyment of beauty, visibly expressed, into it. A "department" may

make every preparation for evoking the artistic spirit, but will it come, being called? or will any amount of advice and selection of "approved examples" bring again, if it has really fled, that spontaneous charm of Indian art which resided in work which the workers did not think of or intend as "art," or as aesthetically correct; which they made because they liked it, without thinking of schools of design or artistic principles? As a man long resident in India observed to us one day, the weavers of the Indian carpets and other stuffs, which we have been in the habit of admiring, did not think of their work as "art," in any conscious manner; it was the way they had always made such things, and they would not have thought of doing it otherwise. But the European serpent has entered into this artistic Eden, and the innocent inhabitants have eaten of the tree of knowledge of good and evil; they have become self-consciously desirous of emulating European art; have lost, or are in danger of losing, the original unconscious charm and beauty of their own. And the European government, by a strange sort of irony, is forming an administration to lead the Indian back into the ways of his own indigenous art, and to show him what is right and what is wrong in it.

With the intention it would be impossible to find fault. But we fear that success, any kind of success that would be worth having, is not to be looked for where the original feeling of native work has really been lost. It cannot, from the very nature of things, be revived by such means. But perhaps the knowledge of the fact that "Sahib" desires to encourage native art and to have its original productions may do something to retard or avert the adulteration of Indian art where it has not already set in. And one object which the new journal has in view is a partly practical one, from which something may come. "One of the most important matters in connexion with the establishment of a demand for Indian art-ware," it is observed in the preface, "is to decide how far it is legitimate to adapt Oriental workmanship and designs to articles of modern utility in Europe and America. The water-pots of the East are useless, except as chimney ornaments, in the homes of the West. The carved steering-chair of an Irrawaddy boat cannot be rigged up on the poop of a Thames steamer. . . . To what extent, then, can Eastern designs and workmanship be applied to Western forms? The issue is one of some difficulty. But unless it is decided, no extended use can be made of Indian art manufactures." This, of course, is a question touching on the commercial side of the subject, and a not unimportant one. But it is a question very difficult to answer. On

the whole, we should be disposed to think that the purchase of Indian decorated objects by Europeans is likely to remain, in almost all cases, a matter of æsthetic only; that they will be, as they are now, *objets de luxe*; and that for all practical purposes European-made articles are likely to be more suitable to Europeans than Indian-made ones, although in many cases, less beautiful. This latter conclusion, we may observe, is only to be adopted *cum grano*. The beauty of fitness and finish which characterises the best European work is an element not to be despised. Splendidly decorated guns are to be found in Oriental and in older European work, but the finish of a modern rifle is more to the purpose. There are in the South Kensington Museum exquisitely-carved old violins and other instruments, which for musical purposes are probably nearly valueless; but who will deny the beauty, though strictly subordinate to purpose, of a plain Cremona violin?

If, however, the movement out of which the *Journal of Indian Art* has arisen does not and cannot accomplish what it seems to aim at, the publication of the journal is not the less an event of interest, and calculated to do a good deal in extending among European readers a more detailed knowledge of the various branches of Indian art-work, the conditions under which it is carried on, and the nature of the work at present being produced. It is intended to publish in each number of the journal an account of some one or two of the art manufactures of India, considered, in the first place, in their relations to the history of the country and the daily life of the people, and, in the second place, to possible European applications and uses, and to the extension of the trade. The first number contains, in accordance with this programme, a very full account of the brass and copper ware of the Punjab and Cashmere, by Mr. J. L. Kipling, illustrated by several plates representing designs for various vessels, drawn by native artists, under Mr. Kipling's direction. Some of these are purely Oriental in general form and outline, as well as in detail; in some we seem to detect an approximation to European forms, overlaid with Indian detail. An illustration of embossed copper, the work of a Sikh artist, gives a curious example of what certainly seems to be a *motif* suggested by Renaissance work,—flowing foliage forms on either side of a centre vase, but the details showing that delicate, nearly natural treatment of flower forms which is so characteristic of Indian ornament,—the ornament of flowers, as it may be specially said to be. The second number of the journal is in a sense a "special" one, giving a greater variety of illustration and a larger amount of coloured work than it is intended always to give. It deals largely with the subject of enamel, giving some account of the varieties of enamel work in different districts; after which follow chapters on stone carving, silver plate, ivory inlays, and garnets; the latter being rather an industrial and commercial than an artistic article. The most remarkable illustration in this number is the chromo-lithograph showing the crutch-staff of the Maharaja Mân Singh, of Jeypore, who died in 1615. Here we have original and unbiassed Indian art in its purity. The staff is composed of thirty-three cylinders of gold, arranged on a central core of strong copper, surmounted by a crutch of light green jade, set with gems. All the cylinders but the lowest (the whole is 52 in. long) are decorated in what appears to be *champlevé* enamel, showing flowers, and figures of all manner of animals, introduced in naïve and wild profusion. Would this pass as an "approved example" if submitted as modern work? We have some doubt of it; certainly, the distribution of the ornament follows no rule of art; but it is the kind of thing that no departmental machinery for producing art would ever call into being. The most interesting illustration of modern work is a powder-horn, of buffalo-horn inlaid with ivory and mother-of-pearl, made by Sila Ram, of Bialwah, near Kotah, and drawn, the two sides, by two native draughtsmen. It is a picturesque thing, not looking quite like pure Indian work; but we should hardly suppose it

convenient for use as a powder-horn. There is the rub, commercially: this powder-flask would do to hang up as an ornament, but the English sportsman would prefer to buy one in Bond-street for use. However, the *Journal of Indian Art* is an addition of distinct and special interest to the list of our art periodicals, and those who pay attention to it will be likely to learn more about modern Indian art-work and its conditions, than they have the means of knowing at present.*

THE HISTORY OF THE RAILWAY SYSTEM IN FRANCE.

In the busy drive of modern life, when change, progress, and discovery that would have filled the term of a generation in earlier times, are crowded into few years, or even months, there is great danger that the history of discovery will be lost,—overlaid, as it were, by its own energy. It is not from the point of view of the historian alone that the want of record is to be lamented. In all mechanical improvement a knowledge of what has been done by his predecessors is of primary importance to the inventor. Those who have had occasion to study the subject know well how invariably the same invention is reproduced, over and over again, by men who, if they only knew the history of their subject, might have devoted their inventive talents to perfecting something that might be of real service to mankind. It is the ignorance of the road by which a certain result has been reached that allows the inventor so often to re-discover an old method, which, may be, has had its day, but which has been superseded by the riper fruits of experience.

Some of the elements of the history of the most wonderful physical revolution that the world has yet witnessed are on record. Many, if not all, of the steps of inventive progress have been necessary stages in order to arrive at our actual condition. But were a writer, however familiar with his subject, to attempt now to bring before the world, in a complete, exhaustive, and yet readable form, a history of the birth, growth, and progress of the English railway system, of the great principles on which legislation for it had been based, and of the place which, in the regard of the statesman, it occupies in the general civilisation of the day, it would be a matter of immense toil to collect such materials as are on record; nor would the outcome, we think, at best be more than a very imperfect sketch.

How such a history not only may be, but has been, written for France we have very admirably shown to us in a great work just completed by M. Alfred Picard, and published under the auspices of the French Ministry of Public Works. M. Picard holds the rank of *Ingénieur en Chef des Ponts et Chaussées*; and was formerly Director of Railways in the Ministry of Public Works. But it is not as an engineer that he writes; nor does his work enter into the subject of the perfection of the mechanical details of the railway system. His duty of central administrator of this great branch of public works commenced at the time when the French Government was about vigorously to prosecute the great industrial programme drawn up in 1879. For his own guidance he found it necessary to study in the fullest detail the history of the French system of railways. Not only did he bring together in their proper order the legislative Acts, whether regulative or administrative, passed since the origin of iron ways, but he also studied the preliminary inquiries and the debates which took place in the Chambers. Analysing and arranging, at first for his own guidance alone, the documents which he was thus led to examine, he found the work grow until it assumed an importance which led the author rightly to think it deserving of publication.

From the brief history thus given by M.

Picard of the origin of his work it will be seen that his explanation that it is not a critical or controversial production is naturally borne out. In that, indeed, lies one of its chief merits. The story is rather of the nature of a chronicle, in which the writer, restrained by the reserve due to his official position from making any comments on what was garnered up by the pen, traces a conscientious and complete history of the constitution of the system that he has studied and administered, and the successive transformations through which it has passed.

M. Picard's work, in fact, makes it only the more desirable that a corresponding work should be, as far as possible, effected for the growth and history of the railway system in this its island cradle. For the contrast between the mode in which the subject has been regarded in France and in England is very striking. No less striking are the results. Nor can anything be readily conceived of more value to the future progress of our industrial development than would be such a comparison of the two methods, the French and the English, as might thus be effected. Is it not of cardinal importance to deduce the lesson which is to be derived from the experience of half a century? We do not speak of railways alone. The inquiry has a much wider range. It applies to all the great inventions of the eighteenth, the nineteenth,—ay, and the succeeding centuries. It is all very well to say that the French method has suited the genius of the French, and the English that of the English, people. But is it nothing to ask which method has had the best results? For it is not, or soon will not be, so much a question of what is most in accordance with the prejudices or the habits of the Frank or of the Teuton, as it is of the method by which, for open competition in the market of the world, the productive and enriching powers of machinery can be best employed.

As to this, a glance at the results, as indicated, on the one hand, in the numerous and valuable tables which have been prepared by M. Systemans, the chief of the division of control of the accounts of the companies and of the statistics of railways, for M. Picard, and which are printed in the fourth volume of his work on "*Les Chemins de Fer*," as compared with the meagre figures of our own "*Railway Returns*," are enough to make any thoughtful man see that there is need of some further information.

Among the tables to which we have referred is one (p. 826) of the relative importance of the railway system as in work in the different countries of Europe on the 31st of December, 1882. Among these England occupies, in most, but not in all respects, the foremost place, but not foremost to any marked degree. The 18,474 miles of open line in the United Kingdom are only 677 miles more than the aggregate of the railways of France, and are 3,139 less than that of those of Germany. Mere length, however, tells for comparatively little. There are three modes by which, as is shown in the appendix to the Report of the Select Committee on Canals (252, 1883, p. 232), a comparison of the proportionate excellence of the communications of different countries may be made to assume a numeric value. Of these one is the proportion of length to area, which may be stated in miles and square miles, as in that report, or, as in Continental usage, in kilomètres and square kilomètres. The second mode is to state the length of line open for each 10,000 inhabitants. These two sets of figures are tabulated by M. Picard. The third kind of comparison, given in the English report, is not illustrated by the French statistic. It is the amount of railway capital and railway income per head. To this has, of course, to be added a comparison of the tariffs, and of the financial outcome of the various systems.

In proportion of length of line to area of country, our readers may be surprised to hear that Portugal comes first, followed by Spain, and then by Belgium. For every square kilomètre in Portugal are open 0.164 kilomètres of railway. In Spain there are 0.157; in Belgium, 0.141. For France the corresponding length is 0.055, or about a third of the Spanish pro-

* The journal is published in London by W. G. Gigg, whose firm also executes the lithography, of which the coloured plates are the best. The others are rather deficient in sharpness and finish.

portion. For England it is 0.005, or 56 per cent. more than in France. This proportion, however, has to be checked by that of the numbers of population accommodated. As to this, Sweden and Norway are at the bottom of the list, with one kilometre of line to every 12,110 inhabitants. In this comparison England and France are marked respectively as fourth and sixth in order. England having 8,454 kilometres of railway, and France 7,660 kilometres of railway, to every 10,000 inhabitants. Thus regarded, the earning power of the English railways, as limited by the population that they serve, is rather more than 10 per cent. above that of the French railways; while the different proportion of length to area is again a mark of a less energetic earning power in the lines of our Continental neighbours, as compared with our own.

In the table of the general results of the working of the French railways for 1882, the total length differs from that given in the table above analysed; a note explaining that certain portions of the lines are worked "*an compte d'établissement*." We do not quite understand this; but take the figures as given in the tables. Over a total of 23,432 kilometres of French railway the mean cost is given at 69,525 francs per kilometre expended by the Government, and 372,607 francs expended by the companies; making 443,132 francs per kilometre in all. In English dimensions this is equal to a gross cost of 28,500l. per mile, which is very close upon the average cost per mile in France in 1867. If we compare this with the English lines, we find that the mean cost of construction, which was 35,254l. per mile in 1867, had risen to 41,605l. per mile in 1882, or to 46 per cent. more than the French lines. The gross receipts per kilometre on the French lines, according to this table, were, in 1881, 45,951 francs per kilometre. The working expenses came to 22,602 francs per kilometre, being at the rate of 49.2 per cent. on the revenue. The resulting net profit is 23,349 francs per kilometre, or almost exactly 1,500l. per mile. In 1867 we make the net receipts to have been 1,460l. per mile. But these figures do not represent the total financial outcome of the French railways. The State, as we learn by another table (p. 996), has received a total sum of 163,378,613 francs, in the year 1881, from taxes and duties on railways, and has further effected an economy of 97,354,345 francs on transport gratuitously or cheaply effected by the lines. It is true that the taxation on the English lines affords a corresponding item to the first of these items; but there is still an item of 97 millions of francs to be carried to the credit of the French railways, as serving the State at a reduction of cost, to which we have no corresponding item in the English lines. As for taxation, the incidence of the Government dues on the lines of the United Kingdom,—or rather on the Scottish and English railways, as those of Ireland are exempt from Government duty,—was 24l. per mile very nearly in 1879. The pressure of the French taxation, amounting to 165 millions of francs on 24,000 kilometres of line, is, at first sight, much heavier than our own, while the economies above stated amount alone to rather more, per mile of line, than the whole of the English Government duty. But we have still to take into account the rates and taxes on the English lines, amounting to nearly double the Government duty. So that we may regard the two systems as about equally weighted in this respect.

Thus at a glance we have the following comparison—

	France.	England.
Cost per mile.....	£28,500	£41,605
Income per mile	2,964	3,512
Working cost	49.2 per cent.	52 per cent.
Net revenue	1,500	1,686
Yielding on capital. 5.26 per cent.		4.27 per cent.

Thus the English lines are more costly in construction than the French by 46 per cent.; and while earning nearly one-sixth more per mile, do so at a rate of working expenditure which reduces their net gain to only about 10 per cent. more per mile than on the French lines;

while on the capital the return is less than on the French lines by nearly 25 per cent.

As to the tariffs,—which, of course, form an integral part of the question,—they are higher on the English than on the French lines, for every item, we believe, except for the carriage of minerals. These the French lines have refused to carry at non-remunerative prices. They are, to a great extent, water borne; a fact which alone is enough to account for both the great reduction in capital cost, and that in proportionate cost of working, on the French as compared with the English lines.

In the preceding columns we have endeavoured rather to show what sort of information may be derived from such a work as that of M. Picard, than to attempt a review of the book itself; for which, indeed, we could not afford the space. The outcome, it seems to us, of the French system is so much more satisfactory than our own, as to show the great importance of a statesmanlike appreciation of the great principles that ought to regulate the development of the system. What these principles have been in France may be thoroughly understood from M. Picard's masterly study. In England the main principle appears to have been to leave everything to unguided private enterprise,—the State not even having taken the trouble to survey, to superintend, or to regulate the location or the working of railways with any reference to the military defence of the country. We do not desire to regard the matter from the point of view either of the proprietors or of the customers of railways. We are anxious to take the standpoint of the statesman. That the internal communications of a country should be, first, scientifically laid out; secondly, constructed, and, thirdly, worked, at the least possible cost, appears to us to be as important as that their net proceeds should pay a fair return on the cost of construction. Take any one of these points (with the sole exception of mineral traffic on trunk lines, not on lines exclusively made and worked for the service of mineral districts) and the result of the French system is undeniably much better than that of our own. Is it to our advantage to have spent 800,000,000l., where on the French system we should not have expended 500,000,000l.?

SANITARY INSPECTION OF DWELLING-HOUSES.

A BILL has just been printed by order of the House of Commons, by which it is proposed to provide for the better sanitary inspection of dwelling-houses. The Bill, which was prepared and brought in by Mr. Monckton, the Marquis of Stafford, Mr. H. T. Davenport, and Mr. Henry H. Fowler, commences by reciting that a large number of diseases arise from imperfect sanitary fittings, faulty house-drains, inefficient ventilation, and contaminated water-supply, and that it is expedient to provide for a more thorough supervision of all buildings during construction as well as for a periodical inspection of all buildings when occupied. It is proposed to authorise every local authority to appoint sanitary inspectors to carry out the Act. These inspectors are to examine the plans of all buildings to be erected, and no building shall be commenced after the passing of the Act until the plans for such building have been approved by the inspector.

The sanitary inspectors shall be guided by the following rules in the examination of the plans and descriptions of all new buildings submitted to them, namely:—That the foundation of the buildings be dry, and a damp-course provided; that the drains be of adequate size, laid with a proper fall, disconnected by a ventilating man-hole or trap from the main sewer, and have their connexions properly made; that there be no direct communication between the drains and the interior of the house; that the soil-pipes be efficiently ventilated and brought down outside the building, without any outlet in proximity to any outlet in such building; that the closets or privies and refuse-receptacles are in proper situations, well ventilated, of proper

construction, and adapted to any scavenging arrangements that may be in force in the district; that all waste-pipes from sinks, basins, cisterns, and baths, discharge in the open air, near but not directly over gullies outside the house; that all cisterns for the storage of water be properly constructed to prevent any fouling of the water, and be conveniently placed for examination and cleaning; that adequate openings from the external air be provided into all rooms and below the joists of the ground-floor for ventilation.

The sanitary inspectors are to be empowered to survey buildings from time to time during the course of erection, and on the completion of buildings shall test all the drains, soil-pipes, and sanitary fittings, and upon being satisfied therewith shall grant a certificate to that effect, and it shall not be lawful for any building to be occupied or used without such certificate having been granted.

In addition to these duties the sanitary inspector and his assistants are, at least once a year after the passing of the Act, to make an inspection of the sanitary fittings, drains, water-closets, earth-closets, &c., means of ventilation, water supply and storage, and all other sanitary appliances and things of all buildings existing in their district after giving forty-eight hours' written notice to the occupier and owner of such building. In the event of any defects being found to exist, the owner or occupier is to be required to remedy them within a reasonable time, and in the event of non-compliance, the Local Authority may, if they think fit, execute the necessary works, and recover the costs from the owner in a summary manner.

The expenses of the inspectors, as well as the expenses of any alterations required to be made to place buildings of every description in a proper sanitary condition, including the expense of opening the drains and pipes for inspection, are to be paid by the owners of the property.

It will be seen from this short analysis of the Bill that it is of an important character, and that if it should become law it will seriously affect the interests, comfort, and convenience of every class, and will place a new and apparently unlimited power in the hands of a new class of officials.

The sanitary inspectors to be appointed by the Act would override the District Surveyors and the Surveyors to the Vestries and District Boards, and would have paramount authority; for by the seventh section of the Act it is expressly provided that their powers shall not be limited to the matters particularly mentioned in that section, so that their jurisdiction would be practically without any limit. This, it is needless to say, goes far beyond any power that has been conferred upon any statutory official, the only approach to such authority being the powers conferred by the Metropolitan Building Act upon the District Surveyors with regard to public buildings; but in that instance there is a right of appeal to the Metropolitan Board of Works in the event of a disagreement between the parties.

There can be but little doubt that the law with regard to buildings in the metropolis requires some further amendment; but the question is a large one, and cannot be properly dealt with by a private Bill. As regards the country at large there is no such need of amendment; the Public Health Act enables Vestries and District Boards to adopt so much of the Model By-laws, framed by the Local Government Board, as they may think fit, and practically to enact Building Acts and Local Government Acts for themselves with such modifications as may be requisite to meet the wants of the particular locality.

The time is not far distant when it will be found necessary to have a new Metropolitan Building Act embodying the amendments which have been made in the law since 1855, (the date of the passing of the present Act), together with such rules for the proper construction of buildings as have found acceptance among practical men. The Metropolitan Board of Works have shown considerable reluctance to undertake the introduction of a comprehensive measure on the subject since their defeat in the Committee Room of the House of Commons a few years ago, and in the present

state of uncertainty with regard to the government of the metropolis, the public will probably have to wait until the general principle of the suggested new municipality is settled before any alteration in the details of municipal legislation can be hoped for.

NOTES.

SINCE the correspondence concerning the proposed transept or *campo santo* at Westminster, which was concluded in our last, we understand the First Commissioner of Works has visited the site referred to, through which Mr. Fergusson's proposed transept was to run. If this official visit is to be taken as indicating any contemplated move towards the realisation of such a scheme as that proposed, we wish to lose no time in recording our own opinion as decidedly adverse to any such wholesale demolition of so interesting a portion of the precincts of the Abbey; and, though we regret to appear in antagonism to any one to whom students of architecture owe so much as they do to Mr. Fergusson, we must say that we think, on a careful examination of the site, that he has greatly under-rated the interest of the remains which he proposes to sweep away, and that in regard to some points he is less accurate than might have been wished. The roof which "forms a vestibule to two second-class residences" appears to be in its original condition, not a restoration; the outer walls under it are not "rebuilt from the foundations"; on the contrary, a great part of the original masonry remains, and though the windows have been refaced outwardly, on the inner side the old mouldings remain. These are remains of secondary importance, certainly; but the portion of the choir arcade of the old infirmary chapel, which now divides two private gardens, is of real interest, both architecturally and archaeologically: it illustrates a curious and unusual point in the placing of the octagonal piers, and the whole is part of the old history of the Abbey. As Mr. Fergusson says its removal "would hurt no one's feelings," we beg to say that it would hurt ours; and we are not "fanatical antiquaries."

WE print elsewhere a letter from Mr. Aitchison, commenting upon the attempt which some (so far) nameless persons are understood to be making to get up an opposition society to the Institute of Architects. We concur entirely in Mr. Aitchison's view of the matter. We are among those who are dissatisfied with the present condition of the Institute; we consider that its councils are too conservative, and that names are permanently prominent among its more influential and talkative members which have little intellectual right to that prominence; but we have always said that this is partly the fault of the quietism or indifference of some leading architects on the artistic side of the profession, who stand aloof and take no trouble to improve matters, and then complain that everything is wrong. The architectural profession is in want of unity now if ever it was; there is all the machinery ready for united action at the Institute, backed by the advantages of permanent head-quarters, a capital library, and, in spite of what malcontents may say, a considerable amount of professional prestige. If a certain portion of the profession deliberately make a party against a central body of this kind, from mere restless egotism and incapability of getting on with others, they will certainly not increase the respectability of the profession in the eyes of the public, nor strengthen their own hands,—not in the long run, at all events.

THE current number of the *Mittheilungen des Deutschen Archäologischen Institutes in Athen* contains material of exceptional interest. Dr. Dörpfeld contributes the result of his recent investigations on the site of the Temple of Athene Alea. Pausanias says of this temple, "as regards its size and the character of its building, it is far before all others in the Peloponnese." He says also of the

Apollo temple at Bassæ, that, after the temple at Tegea, it was foremost for the beauty of the stone used, and the harmony of its building (Pausanias, viii., 45, 5; and viii., 41, 8). He further noted that it contained columns of all three orders, Doric, Ionic, and Corinthian. Dr. Dörpfeld's investigations confirm the opinion of Pausanias, and throw new light on the arrangement of the columns, as well as on the superior size of the temple, respecting which the previous measurements of Dr. Milchoffer had presented some difficulties. Architects and archaeologists will look with interest at the fragments published in the accompanying plates. To artists the temple has a special interest, because the pediment sculptures are known to have contained groups actually from the hand of Scopas. Of one of these groups, representing the head of the Calydonian boar, some few fragments lie in the local museum at the neighbouring village of Piali. More complete excavations are earnestly needed, and would almost surely be rewarded by success.

MR. BROADHURST'S Bill for the Enfranchisement of Leaseholds came up for its second reading in the House of Commons on Wednesday afternoon, and was thrown out by 168 votes to 104. We are not surprised at this result. In our number for January 12th we dwelt upon some of the ways in which the working of such a measure would be found to be impracticable, and most of the objections which we then and on a previous occasion urged against it seem to have been present to the minds of our legislators. Great as are the evils of leasehold tenure in London and other large towns, no such drastic remedy as Mr. Broadhurst proposes (and which would, as we have shown, defeat its own object to a great extent) is likely to meet with acceptance. The Attorney-General very justly pointed out that the Bill, by exempting leases of less than twenty years' term, would multiply short leases, and encourage the building of "cobweb" houses. We are very much in sympathy with Mr. Broadhurst when he says that the existing system of leasehold tenure has degraded the art of house-building, and we have often expressed ourselves to a similar effect, but it is more than doubtful whether the Bill of which we are writing would regenerate our speculating builders.

THE re-affirmation of the original verdict in the case of *Belt v. Lawes* has saved the readers of daily papers from being burdened over again with what threatened to be an interminable flow of conflicting evidence and eloquence, and appears to show conclusively what is the aspect of the case to the minds of judges and juries. It also indicates that there are questions in connexion with artistic practice the real bearing of which is beyond the limit of treatment by legal machinery. We are not concerned to justify either side, none of the parties most intimately concerned having gained much credit by the case. But we suspect that the opinion of the minority who are really competent to understand the artistic and moral bearing of the issues involved will be little modified by the legal verdict. The most absurd part of the whole thing is that such a battle should have arisen mainly out of a contest for the honour of having originated or "invested with artistic merit" one of the worst and feeblest public statues ever erected in London.

THE legality of the process, of cremation, provided that it is so performed as to involve no public nuisance, having now been settled, the subject enters on a new phase, and it is of some interest to note the various opinions in regard to it which are making themselves heard. The Cremation Society of England have sent round a circular stating the conditions under which they are prepared to undertake cremation, these involving a distinct statement as to the wish of the deceased, a certificate from a medical man that death was from natural causes, or, in the absence of that, a *post-mortem* examination by a medical officer appointed by the Society. These are reasonable and practical conditions, whereas the sug-

gestion, at a meeting of the City Commissioners of Sewers on the 18th, that a *post-mortem* by a public officer should be a condition in all cases, would unquestionably, if agreed to, be a serious bar to the general adoption of the system. Sir William Harcourt has declared his intention of opposing cremation in all cases which come before him, because he considers there is a strong public feeling against it; which amounts to saying that, the public being prejudiced, he will be prejudiced also. On the other hand, Sir Spencer Wells wrote a thoughtful and considerate recommendation of the system in the *Times* of the 8th, calling attention to the amount of decaying matter left underground for an indefinite time on the interment system, while under the cremation system "the ashes of the people might repose in death near the scene of their work in life, perfectly harmless, instead of polluting the earth of the churchyard and the water drunk by the surviving people." The system is hardly even fairly on its trial yet, and we never have definitely recommended it; but we may observe that a system supported by such medical testimony in its favour is not to be disposed of on mere objections of sentiment. We are in such matters, as the Poet Laureate has said, "the fools of habit"; and what is repelling to our thoughts at first may cease to be so when a new habit brings new associations with it.

WE learn from Paris that the completion of the Carnavalet Museum in the Rue des Francs Bourgeois, for which funds were voted in 1880, is now to be carried out. In this Museum will be exhibited the views of ancient Paris, which are at present placed temporarily in a room where the light is too deficient for them to be well seen. The Museum will also be made the repository for various architectural fragments of interest, including numerous remains from the ancient Hôtel de Ville. The Minister of Instruction and the Fine Arts is preparing a report on the general condition of the museums of France, which will shortly be submitted to the Government.

ON Friday last there was presented to the Architectural Association a copy of the Sketch-book of the Boston Architectural Association, a volume of sketches from old European buildings, which shows that in Boston, at least, American architects have nothing to learn from those of the old country in regard to style and artistic feeling in architectural sketching. The Association is, we understand, small in numbers at present, but it makes up in ability for its limitations in that respect, if these sketches are any criterion. They are freehand sketches, executed with that mixture of freedom of touch with precision of line which marks the true architectural sketcher. The drawings are mostly comparatively slight, but show sufficiently what they intend to show. The editors, Messrs. E. D. Andrews, E. M. Wheelright, Cass Gilbert, and W. E. Chamberlin, pay a deserved compliment to the Forbes Lithographic Company of Boston for the excellence of the autotype reproductions. English architects will have to trust in Providence and keep their pencils sharp, unless they would be distanced by their cousins over the water.

AN example of a new method of decorative painting on a mirror surface, by Mr. Gullick, has been on view during this week at 103, New Bond-street. The speciality of it consists in painting figures, &c., upon a large mirror, so as to appear as if floating in space; the example exhibited consists of a dining-room decoration on a mirror, supposed to stand behind the buffet, on the lower portion of which is painted a very realistic pile of fruit; on the upper portion a train of Amorini, flying in semicircle, holding festoons. The effect, as used here, is tawdry, and the painting of realistic fruit as "ornament," in such a position, is in the very worst taste; but the system, if used in a somewhat different manner, would undoubtedly be susceptible of some new and very striking decorative effects.

We print elsewhere a portion of the very full and interesting paper read by Mr. Gale last week at the Civil and Mechanical Engineers' Society, on "American Construction," which dealt largely with the use of iron as the material for ordinary dwellings as well as public buildings. The practical advantages, for the time, of this mode of construction are in certain points undeniable; but if we are asked to regard this as the material and method for the architecture of the future, it must be concluded that the interest of architecture, from the point of view of artists and cultivated people generally, must become very different from that which it has hitherto presented. Architecture has hitherto been considered a central art of peculiar dignity and interest, combining artistic with historical significance. But it is difficult to say where either artist or archaeologist will find much to fire their minds in a type of building which is dependent on the duration of angle-iron, aided by an indispensable preservative coating of paint.

LATIN LEGENDS ON AND OVER LINTELS.

It is not a little significant that so many of the inscriptions over old doorways are in Latin. We might almost assume it was taken for granted that those who could read at all could read Latin. At least, we may be certain those who could express their thoughts in Latin were too impressed with its superior conciseness and dignity to use the vernacular. Boswell tells us Dr. Johnson peremptorily refused to re-write an epitaph on Goldsmith in English. "He desired Sir Joshua to tell the gentlemen that he would alter the epitaph in any manner they pleased, as to the sense of it; but he would never consent to disgrace the walls of Westminster Abbey with an English inscription." And if we turn to the pages of the "Citizen of the World" we may note Goldsmith curiously records two Latin inscriptions as carved on the garden-gates belonging to the Chinese philosopher.

Many Latin inscriptions are to be seen in Cumberland; sometimes on the homely and sturdy manorial houses; sometimes on lonely grey farmhouses, among the fells and becks and rocks; sometimes on smaller houses in the grey towns. Occasionally there occurs an English couplet or stanza, but the larger number are short, pithy Latin sentences. In some instances an inscription has been repeated in the same district by an admiring neighbour. Thus, at Blencowe Hall, near Greystoke, there is carved over the principal doorway—

"QUOR SUM 1590
VIVERE MORI. MORI VITE.
Henricus Blencowe."

And at Millbeck Hall we may read,—

"1592. QUOR SUM. M.V.
VIVERE MORI. MORI VIVERE.
Nicholas Williamson."

As a rule, however, each motto seems to have been selected for its fitness for the purpose in hand, just as when the monkish builders of York Chapter-house looked upon their superb work with rapturous content, they inscribed on the lintel of the inner side of the doorway,—

"UT ROSA FLOS FLORUM
SIC EST DOMUS ISTA DOMORUM."

On Bartoe Hall is inscribed, "Non est hæc requies, 1628"; and on Barton Vicarage, "Non mihi, sed successoribus, 1637." A small house at Eamont Bridge is inscribed, "Omne solum forti patria est. H. F., 1671." And in Penrith there is a house inscribed, "Ex samptibus Du Wil Robinson, Civis Lond. Anno 1670."

Sometimes there are several Latin mottoes in small out-of-the-way villages, associated with the arms of the families owning the properties on which they occur. In Northumberland, on the north-eastern coast, midway between Barnborough Castle and Dunstanborough Castle, for instance, is a village known as Beadnell, but called by its seafaring inhabitants Beadlin. It has a wide and spacious green with a church upon it, and two great houses with their grounds bordering one side of it, and a row of small stone houses facing them on the opposite side of it. One of these small houses has the date 1630 deeply cut on the lintel of the door. Over the next doorway is a coat of arms, with the motto "Redde diem" carved in stone. In the

same row is another house with the same motto carved upon it. The village inn, too, which has been a pele tower, and still has a stone vaulted chamber on the ground-floor with walls that are nearly 5 ft. thick, has its Latin motto, "Dum vivo spiro," associated also with a coat of arms carved upon its principal front, which has been modernised.

Hexham has a few interesting examples of inscriptions on houses, both in Latin and English. An Elizabethan house in Market-street has on the door-head, in incised letters of quaint workmanship, "SOLI. DEO. CELI. AC. SOLI. CREATORI. LAUS. IVLII. 15. AO. DNI. 1641"; and a house of the Tudor period in Gilesgate has on its lintel "Honi soit qui mal y pens. W. S. B. Anno Domini 1638." There is also an ancient oak mantelpiece in Hexham with a curious inscription that has been accepted as Saxon.

Over the doorway of Felton Vicarage, still in Northumberland, within a triangular border, is an inscription, thus worded:—"1683. Has. Edes. Posuit. Robertus. Henderson. Trinitatis. Colegii. Cantab. Tempore. Barrowi. tempore. Novioni. Socius. Hujus. et. vicarius. non. indignus. vicarius. Pietatis. ergo. posuit. hoc. patri. filius. testimonium. 1756."

In Yorkshire, the old three-gabled hall at East Ardsley has over its doorway, dated 1632, the motto "In Domino Confido."



The fine quadrangle of Jesus College, Oxford, has a handsome doorway, of Stuart times, inscribed, "Ascendit oratio, descendat gracia." On a house at Hyde, Essex, is carved "Ostium pietatis cor magis." The vicarage-house at Colyton, Devonshire, has a Latin motto over a window, "Peditatio totum, meditatio totum."

Wyndestay has the following:—

"Qui domus est victorie decessit patriis dulcis
Sunt scitis hæc vite cuncta rura labor."

Edinburgh still possesses numerous examples of Latin inscriptions on old houses, especially in its narrow wynds and closes, where modern improvements have not called for their demolition, as in the principal streets. In Rac's-close there is a house inscribed "Misere mei Domine A Peccato Probo Debito et Morte Sabita me Libera 1618." In Trench's-close there is, "Hodie, Mihi, Cras, Tibi," inscribed on a house.

In Blackfriars-wynd this inscription occurs:—"In te speravi. Pax intrantibus. Salus exantibus. 1619." In Anchor's-close we may read, "Augusta adsum augusta." Two entrances to Advocate Hope's house, in Cowgate, are respectively inscribed, "Tecum Habita," "Xospes humo." The old Assembly-rooms are inscribed, "In Domino confido. 1602." On the house of Mary of Guise is the motto, "Laus et honor Deo." On a house in Sempell's-close, dated 1688, are both English and Latin inscriptions. The last-mentioned runs,— "Seeles Marret optima coelo." Over the door of a house in West Bow is carved, "Soli Deo honor et gloria." The Tolbooth, in Canongate, too, has the Holyrood arms on it, and the motto, "Sic ut ad astra," and many of the country-houses of the Scottish gentry and nobility have also preserved these curious mementos. These mansions, always picturesque, with their crow-stepped gables and high chimney-stacks, occasionally possess doorways with richly-moulded jambs. On the lintel of the entrance-door to the staircase of Darnick Tower, about a mile west of Melrose, is a central sunken panel, with the sacred monogram carved on it, with two others containing the initials of the owner and his lady at the time of the date, 1659,

which is carved on a fourth panel. Boswell tells us, in his account of his tour in the Hebrides, he had special satisfaction in pointing out to Dr. Johnson the motto carved on the front of his ancestral residence, Auchinleck. This legend runs,—

"Quod petis, hic est
Est Ulubris animus si te non deficit æquus."

And he quotes in full a very lengthy inscription on Dunvegan Castle, with similar enjoyment.

Marlefield House has over the door the coat-of-arms of the Bennetts, and their motto, "Benedictus qui tollet crucem."

Houndwood House has a rhyming couplet:—

"Nunc mea Tunc hujus
Post illius, nescio cujus. 1656."

In a lane in Whithora is a house, inscribed over the door:—

"Qui studeat optatum cursu contingere metam
Multa tulit fecit que puer sudavit et abest."

And at Abbotsford, built in above the library window, is a lintel from the door of the Common Hall in Edinburgh University, with this inscription:—"Virtus rectorum ducemque desiderat, vitia sine magistro discuntur."

"Per Augusta ad Augusta" is inscribed over the door of an old house in Coire.

Occasionally we find Latin inscriptions within doors on chimneypieces, and on pieces of furni-

ture. A chimneypiece at Knolle, Surrey, is inscribed "Æstate fryeo Hyeme incalisco."

A mantelpiece in the hall of the Vicar's Close at Wells sets forth:—"In vestris precibus habetis commendatum, Dominum Ricardum Pomroy quem salvet Deus. Amen." Chairs were often thus decorated. The Glastonbury chair is a case in point. "Crestu sub pondere virtus" occurs on some chairs in a country seat at Llanbedr. This, however, is a branchlet of the subject that requires special treatment.

A TREATISE ON STEEL AND IRON.

Mr. GREENWOOD'S latest book* covers a vast field, one too vast to be satisfactorily treated in a work of its dimensions. It is said to be written for the use of the "general student" and the "intelligent workman." It is a difficult thing to cater for individuals differing widely in experience and ways of thought, and in endeavouring to combine the necessities of two such opposite stand-points the author sometimes fails to satisfy either. In order to compress the vast array of facts within the compass of the volume, they are so closely packed, and the paragraphs and sentences are so curtailed, that they often require a good deal of analysis before one can arrive at the author's meaning.

The work represents an amount of research and a knowledge of the subject that are worthy of being brought forward in a more attractive literary form.

The book opens with a useful chapter on the meaning of terms. The important subject of refractory materials is then briefly considered; whilst ten pages are thought sufficient to convey all the information required on iron ores. A chapter of twenty-one pages exhausts the "metallurgical chemistry of iron," so far, at least, as the work under consideration is concerned. A good deal of information in a con-

* Steel and Iron: comprising the Practice and Theory of the several Methods pursued in their Manufacture, &c. By William Henry Greenwood, F.C.S., Assoc. M.I.C.E. &c. London: Cassell & Co. 1883.

densed form is given on blast-furnaces and their appurtenances. Few people excepting those connected with the iron industries know what a change has taken place in the construction of blast-furnaces within the last few years. Not very long ago we were using the ponderous masonry blast-furnace, ranging from 30 ft. to 40 ft. or 60 ft. in height; but the introduction of the cupola furnace, in which the body is composed of iron plating lined with brickwork, has led to the building of furnaces over 100 ft. high, and 25 ft. to 30 ft. in diameter. In this part of the book are found some plain descriptions of the various types of hot-blast stoves, by means of which the waste gases collected at the throat of the cupola are used for heating the air fed to the furnace; sometimes, we are told, to as high as 800 deg. C. (1,477 deg. Fahr.). The mention of hot blast naturally leads to the consideration of water-tuyeres, two types of which are illustrated, the Staffordshire and the Scotch coil. No mention is made of Lloyd's open-ended spray tuyere, which, we believe, is more frequently to be met with in South Staffordshire than the closed-ended water-tuyere proper. A short account of blowing-engines, hoists, lifts, and elevators, gives some information on these subjects; whilst a chapter treating of fuel, blast, charges, yield, and waste gases of the blast-furnace completes this branch of the subject. The Foundry follows, an account of which is condensed within a space of sixteen pages, for which the author makes an apology on the score of "limits of this volume." The section devoted to the many processes incident to the production of malleable, or, as it is more generally called, wrought, iron, is the most satisfactory part of the book. As Mr. Greenwood very justly points out, in the present day,—putting aside the difference in process of manufacture,—it is difficult to say where iron ends and steel begins, the steel produced by the Siemens process being in many respects more nearly allied to wrought-iron than to steel proper. The term "ingot iron," which is sometimes, though seldom, applied to these products, is a correct and definite one, and it would save a good deal of misapprehension if it were more often used in this connection.

A description of some of the direct processes by which wrought iron is produced directly from the ore will be read with interest, notwithstanding that they are now little followed in England. It is, however, to the indirect processes, by which the great bulk of malleable iron is obtained from pig, that the most important section of this part of the book is devoted. The open-hearth fineries and dry puddling are first dealt with, after which a lucid description is given of the more universal wet puddling, or "pig boiling," as it is popularly called, in which the decarburisation of the iron is effected in a bath of fluid slag. The use of Siemens's regenerative gas-furnace for puddling, Price's puddling-furnace, the Ponsard regenerative gas-furnace, and the Bicheroux gas-furnace, are then referred to, and, after three pages on malleable iron castings have been sandwiched in, the various mechanical puddling-furnaces which have been tried in this country are well treated of; two good illustrations of Danks's revolving puddling-furnace helping to describe the system, of which such high hopes were entertained a few years ago,—hopes which have been, as yet, but poorly realised.

The mass of puddled iron when taken from the furnace is followed to the shingling and blooming machinery, where it is passed, before it cools, through the squeezers, or, according to more modern practice, under the hammer, in order to expel the slag and weld the puddled ball into the coherent mass of malleable iron, known as the shingled bloom. Descriptions of different forms of squeezers, the old-fashioned helve, and the more modern steam-hammer, which has almost superseded it, are given in a concise manner; although, no doubt, the student would gladly have a rather more detailed description of the latter machine. Sir Joseph Whitworth's hydraulic forging-press is also illustrated and described, after which the puddling rolls, used for the conversion of the shingled bloom into puddled bar, and mill-rolls of various kinds used for rolling sections, rails, plates, &c., are somewhat fully dealt with.

Six chapters, 133 pages in all, do not allow too much space in which to treat exhaustively the metallurgy of steel, but we are bound to confess that Mr. Greenwood has used his opportunities with considerable skill, and manages to

convey a great deal of useful knowledge, considering the limited space he has here allowed himself. Analyses of various kinds of steel are first given, following which is a discussion on their respective characteristics, and the effects of different alloys usually met with in practice. The chapter concludes with a summary of the advantages of mild steel over iron for structural purposes, the principal of which is a gain of from 30 to 50 per cent. tensile strength. Steel is produced (1) either directly from iron ore; (2) by the carburisation of malleable iron; or (3) by the decarburisation of pig-iron. Several processes may be included under the first heading, but they are of small practical importance, and but little space in the book is devoted to them. The second methods comprise those by which tool steel is produced. Amongst these the cementation and crucible processes are briefly described and illustrated, and after this we come to the part of Mr. Greenwood's work which will probably be looked forward to with the greatest interest by the majority of his readers, and we think their only regret will be that it is so short.

The Siemens and Siemens-Martin processes are first described in this section of the work. Illustrations are given of the open-hearth regenerative furnace, accompanied by a concise description of the way in which it is worked. The manufacture of Bessemer steel (the world's production of which is 3,000,000 tons annually, we are informed) is there well treated of, the text being assisted by several good illustrations. Our author brings us down to recent practice in this subject, describing the improved form of converter used in the basic process of Thomas and Gilchrist, by which the phosphoric ore of the Cleveland district can be converted into mild steel. An analysis is given of a steel having only 0.021 of phosphorus, which was obtained from pig originally containing 1.22.

The book concludes with a brief mention of some of the processes used for producing steel castings free from honeycomb, amongst which Whitworth's hydraulic fluid-pressed steel naturally receives the most attention.*

PICTURES FOR THE FORTHCOMING PARIS SALON.

ACTIVITY reigns at the present moment in the artistic world in Paris,—in the newly-created "kingdom of the artists," as has been termed the grandiose neighbourhood which has sprung up round the Avenue de Villiers (the Melbury-road and Hampstead and St. John's Wood combined of Paris), in the more Bohemian and no less industrious district which clusters round the heights of Clichy, and in the quieter classic Quartier Latin. The works for the annual Salon, which, as our readers are aware, opens, like our own Royal Academy, in May, have to be sent in during the first fortnight of this month,* six good weeks being necessary for the authorities to select and hang the several thousand pictures which are to grace by the 1st of May the numerous rooms of the Palais de l'Industrie.

What with the visits to the studios, which have, of course, been open to sympathetic friends, and the private exhibitions at the art clubs, it is not difficult for those familiar with French art to form a very fair idea of what promises to be the general character of the forthcoming Salon. Fortunately we are not likely, from all appearances, to hear the too usual cry that the exhibition is to be inferior to those of late years; at least, that parrot-like criticism has not so far reached us. The Continental artists, those at least,—and their number is considerable from every part of the world,—whose ateliers are situated in Paris, would appear this year to have made what may fairly be regarded as a marked effort. If it is possible to detect an evidence of a rather pronounced commercial tone in the character of their work and dealings, the artists can, after all, not be so much blamed for conducting their profession in the prevailing spirit of the day. Not that we see in the pictures now just leaving the easels of the painters for the galleries of the Palais de l'Industrie any (save in exceptional instances) outrageous bids for popularity such as have been too glaringly conspicuous at the Paris Salon within the last ten years, or any evidence of

what may be called the evil effects of the mannerism of certain French painters, whose works of late have provoked a great deal of discussion and produced no small influence not only on the French school, but on our own. To those who have remained faithful to the older traditions it is gratifying to find that the pictures which are likely this year to form conspicuous features in the Salon have been created more or less on those old lines and old modes of study which have so justly gained the esteem of succeeding ages.

One thing is unquestionably apparent from the promise of the works to be exhibited in May next. The influence of the school of the "impressionists," which has of late years been so strongly developed at the annual Salon as to have positively driven from their walls the works of some of the older school, will, we feel justified in predicting, show itself this year in greatly diminished force. We have, of late, been sadly puzzled by the momentary fascination of "impressionism" and "realism" and a dozen other independent groups, but this year we suspect the French school generally will show a more marked allegiance to the methods and aims of the older masters, some of whom are still happily living; and many of those who, a few years ago, were less thought of, are likely to take a higher place than ever in the opinion of the true art-lovers. When it is remembered how influential a power the prevailing French taste in painting exercises on all the great schools of the world,—for not only the Continent, but America and England; it must be admitted, are tributaries to French art-teaching,—it is pleasant, yet only what might be expected, to find the eternal influences of the ideal again gaining the upper hand and triumphing over the momentary influence of fashions which, whatever may be said in their favour by their admirers and votaries, have never yet succeeded in holding a stable position during any lengthened period. Perhaps in only one feature,—a feature not sufficiently appreciated by critical English visitors to the French exhibitions both in Paris and London,—can such momentary excesses be excused and even commended; they denote a life and enthusiasm which we suspect would be found to be wanting in our own more respectable school which produces none of those so-called exuberant vulgarities which we are so fond of execrating in French art. Just as it has been said that religious schism denotes the existence of religious fervour, so do such artistic schisms as the periodical excesses of French art prove the presence of a youthful life-blood bubbling over with exuberant riot, such as those who truly love our English school would desire to see some symptoms of in our exhibitions, with their too fatal dead level of admirably respectable talent.

Coming more particularly to a few of the works we have seen by the holders of some of the more familiar names which will be represented in a few weeks in the Champs Elysées, it will astonish not a little English visitors this year who are well acquainted with our own Millais's manner, to observe the extraordinary resemblance between the portraits of Baudry and those of the eminent English Academician,—who, by the way, is known to be an admirer of the brushwork of his French confrère,—but, let us hasten to add, no one for a moment can fail to see the superiority of our own English painter. Carolus Duran appears this year to have returned in a measure to the execution of his earlier and more careful years. Gérôme, who still stands foremost in the school of painters whose un-failing hand is always on a par with their intellectual conception, has so far promised a characteristic canvas, "Two Majesties," a wild, haggard lion of the desert, watching with an expression (not, as was complained of in Landseer, too human, but with rapt contemplation) the burning disc of the sun setting in the waves of the limitless ocean. Those two popular painters of the painful but ever stirring scenes of the Franco-Prussian War, happily less and less represented at the exhibition, Detaille and De Neuville, show no falling off in their powers, though we must not expect any startling hit from the works so far shown to the public. Meissonier, though he has produced and exhibited two small portraits, will, we may feel sure, be absent as usual from the annual "bazaar," as the Salon has by some been contemptuously termed. Benjamin Constant is not likely to specially distinguish himself this year, but he will be ably represented by one or more

* Paintings and water-colours from March 5th to 15th; sculpture from March 21st to April 11th; architectural drawings, engravings, &c., from April 2nd to 3th.

of the familiar Oriental subjects he treats so skilfully. Passigni will, among other works, show us a superb view in Venice,—a marvel of the pictorial architecture of which he is so profound a master. Cabanel and Chaplin will be represented by a number of portraits which are so much admired in the aristocratic circles of Republican France; Henner will show us some of his brilliant studies of the nude; Van Marcke his ever-popular cattle pieces, set in the midst of Troyen-like landscapes; in fact, it may be said,—apart, of course, from those artists whose works are not so familiar to the English public,—that each painter will be very favourably represented this year in the style in which he has gained his reputation. The very large American contingent who reside in Paris, and who are always well represented in the *Salon*, will be led this year by their brilliant young countryman, Mr. Sargent, whose style it is, however, none the less distressing to see becoming almost more "flimsy" than that of his master, Carolus Duran.

From a cursory examination of these and many other works, the impression remains of a decided advance in a direction which, we repeat, is opposed to "impressionism," "realism," or whatever the tendency may be termed. Landscapes and portraits we may expect to see in more than usually large numbers, but in the anecdotic and other works those who are admirers of the older methods may feel confident that a distinct step in this direction will be observed this year. Only a few days since, in bringing to a close the series of annual lectures which he has now delivered for twenty years in the famous "hemicycle" of the *Ecole des Beaux-Arts*, M. Taine, amidst a hearty expression of sympathy in bidding his auditors goodbye, urged upon the rising generation of artists the necessity for the greater introduction of literary culture, of intelligence, into their creations; in fact, Reynolds's familiar precept of the necessity of one's colours being "mixed with brains." It is in this direction that our modern art can hope not only to hold its own with that of the past, but be saved from falling into the stagnation which inevitably follows on the absence of the revivifying action of contemporary influences,—influences which in the present day are so essentially intellectual in their general tenour.

MR. POYNTER, R.A., ON THE CONNEXION BETWEEN ASIATIC AND GREEK SCULPTURE.*

THE question now arises as to the influence which this art brought to bear on the beginnings of Greek art. Flaxman was only repeating a common tradition which was held by the Greeks themselves when he connected the two together. Dædalus, the mythical personification of the earliest growth of the arts of Greece, was said to have visited Egypt, and to have constructed the labyrinth of the Minotaur in imitation of that of Amenemhat of the twelfth dynasty, in the neighbourhood of Lake Moeris; he is also said to have built the propylæa of an Egyptian temple at Memphis, and to have executed his statues in the Egyptian style. This last attribution points undoubtedly to the belief in an Egyptian origin for Greek art; and the myth of the migration of Danaus from Egypt to Greece also indicates an early connexion between the countries, and points to some historical event, no doubt; for the Danaï are mentioned in an inscription of Rameses III. as a race in league with others along the African coast whom he defeated. These, however, were mythical times for Greece. A more recent connexion is that which I have already mentioned, when during the twenty-sixth dynasty the Greeks were allowed to settle at Naucratis in the Delta, and to build a temple there, in what style we cannot now know. This was about the middle of the seventh century,—a time when Greek art and architecture were beginning to take form; and this would be the time, if any, when Egyptian influences would affect the character of Greek aspirations. It is, however, I think, very difficult to trace any such lasting influence from Egypt as is forced upon us when we compare early Greek art with Assyrian. Still it can hardly be doubted that the great monuments of Egyptian grandeur which the Greek visitors would see around

them must have had some effect on the formation of their style, and it was some time during the seventh century that Theodorus of Samos, to whom I shall refer later on, is said to have visited Egypt.

Much has been made of the resemblance between the Doric column and the fluted columns of the rock tombs of Beni-hassan of the time of Osirtesen, of the twelfth dynasty, and the resemblance is, no doubt, at first sight striking; whence the idea was started by, I believe, Champollion, and taken up by Barry, Wilkinson, and others, that here was to be found the true origin of the Doric column. But the science of criticism has considerably advanced of late years, and casual resemblances, however striking, are not easily accepted as evidences of similarity of origin; and it seems almost certain that we have here an accidental likeness, and not cause and effect. Beni-hassan is a long way from the Greek settlement in the Delta, and the Greeks, if they borrowed their column from Egypt, would be more likely to take from a style of architecture which was universal, and which habitually surrounded them, than from remote and exceptional specimens. I have thought it worth while to refer you to illustrations of the Greek and Egyptian columns side by side, in order to point out the differences; which are really far more striking than the misleading resemblances. In the first place, the Egyptian column has a base and no capital, whereas the Doric has a capital and no base. Then the Doric order has architrave, frieze, and cornice, and is adorned with triglyphs and metopes, with their accompaniment of mutules and guttæ, all of which are invariable in the order; while the Egyptian column has only an architrave, with an imitation of the heads of rafters above. Then, again, the proportions are totally different to the earlier form of the Greek Doric, the resemblance being to the later and more refined form of the Parthenon column. Not to pursue the differences further, we find that to the early form of the Doric column there are really only two points of resemblance,—that both columns diminish from the base upwards, and that both are fluted.

M. Chippiez, in his "Origin of the Greek Orders," thinks it probable, however, that the Doric column first took its definite form under the influence which the massive stone construction of the Egyptians had upon these early Greek visitors, and there is no doubt some resemblance between the triglyph and the usual ornament introduced into the Egyptian cornice,—which, again, must not be pressed too closely; and it is undoubtedly that the earliest Doric temples which remain date from the end of the seventh or the beginning of the sixth century B.C. The fluting of the column, however, M. Chippiez derives from Asia, and for the details of the order,—cornice, mutules, triglyphs, metopes, guttæ, &c.,—he considers that the Greeks are indebted to what is usually called the solar myth,—a highly elastic theory, to which it would appear everything legendary may be traced.

But the Doric column is not the subject of my lecture, and I shall not attempt to clear up the mystery of its origin, for which we may, perhaps, have to return to the discarded theory of the wooden hut. I can imagine, however, just such a general influence of Egyptian on the beginnings of Greek sculpture as M. Chippiez has suggested for its architecture; but it is certain that Greek sculpture was not indebted for its beauty or style to the similar qualities which we have found in the statues of Egypt; nor can we trace any lasting Egyptian influence on Greek ornament.

The effect of Assyrian art is more obvious and was more durable. It would seem impossible to doubt the origin of the two principal features of Greek ornamental design, the palmette or honeysuckle ornament, and the guilloché. The great similarity, both in construction and detail, of a flower design from a glazed tile from the Palace of Khorsabad, with the patterns common on Greek vases, would also seem to point to an Assyrian origin for the latter.

It is difficult also not to believe that the Ionic capital had its origin in the volute so constantly found in Assyrian ornament, and which was, so to speak, ready made, to take just as it was, in the capitals of Assyrian columns.

We have thus a certain number of forms originating in Assyria and taking a prominent and permanent place in Greek art, to be trans-

mitted through the various phases which architecture and decorative art have assumed in the process of their development, down to our own times. That Egyptian and Assyrian art found its way to the Greek colonies of Asia Minor by means of the Phœnician traders, has long been recognised,—not only to Asia Minor, indeed, but to all the coasts and islands of the Mediterranean; the details of the splendid Etruscan sarcophagus in the form of a couch, with two figures reclining on it, which is in the British Museum, seeming to show unmistakable derivation from Assyrian forms. Mr. Murray, who, in his recently-published history of Greek Sculpture, has gone into this subject, shows, by many instances taken from Homer, that the Phœnicians were the purveyors to the Greeks of all the better-executed objects of handicraft in those early times, when their own art, or industries rather, were of the very rudest type; and that commerce between the Assyrians and Phœnicians was fully developed he shows to be proved by weights having been found with inscriptions on them in both languages.

It also seems impossible to doubt the influence of Assyrian art on the treatment of the figure. It may be asked, if the Phœnicians traded with Egypt, as they undoubtedly did, carrying, as we know, Egyptian wares or Phœnician imitations of them to Assyria, why do we not also trace the influence of the much more beautiful Egyptian art? The cause appears to be this,—that the art of Egypt was, in the eighth and seventh centuries B.C., virtually dead, while Assyrian art was at that time in the height of its glory. A short account of its history will make this clear to you.

Assurnazirpal, who founded the Second Assyrian Empire, and who built the north-west palace at Nimroud, the earliest of their palaces which we know, lived in the tenth century B.C. This palace was covered with sculptured reliefs, now in the British Museum, which are as full of life and incident as the later reliefs, and only differ from them in style in giving a somewhat ruder and more stunted form to the human figure, and in being less richly and minutely covered with ornament. In other respects they are so similar in style and treatment that to an unpractised eye they may easily be confounded with those done 300 years later, so gradual was change in those early times and with Oriental races. After him a succession of kings,—Shalmaneser, Sargon, Sennacherib, Assurbaddon, and last, though not least, Assurbanipal, in whose reign those lion-hunts were executed which you all know so well as the glory of our Assyrian collection in the British Museum, continued to rival and excel Assurnazirpal in the splendour of their palaces and the sumptuousness of their sculptured decorations. This series of monarchs brings us down to the destruction of Nineveh under Assuredilani, the Sardanapalus of the Greeks, in the year 632 B.C., who also built himself a palace, which, however, owing probably to troubles and invasions during his reign, was a very plain building without sculptures. By this time art was beginning to be an active force among the Greek races, and Assyrian art now ceased to exist with the transfer of power to the Babylonians. But a kindred art, no doubt, continued to flourish in the gorgeous palaces and temples of Nebopolassar, Nebuchadnezzar, and the succeeding kings who reigned during the 100 years down to the fall of Babylon under Belshazzar in 536 B.C. Of this period no remains of importance have come down to us, so complete was the destruction of that mighty city. It may have followed the Assyrian lines, or it may have continued the tradition of the very Early Chaldean art, dating, it is believed, from 2,000 years before the Christian era, of which various important remains have been found at Tel-lo in southern Chaldaea. These fragments of statues, which are due to a non-Semitic race, show far more freedom and more character in the rendering of the human form than any Assyrian sculptures. The hands of these statues,—which, being in very hard stone, are well preserved,—are true in detail, and of excellent workmanship, and the few injured heads which have been found also testify to a higher feeling for portraiture and character. There is also a perception of the proper treatment of drapery; the arrangement is intelligible, the turn-back of the edge of the stuff is treated with a genuine observation of nature, and the folds indicated take the true direction. Of any perception of this kind the Assyrians were totally destitute from the first to the last;

* A lecture delivered at the Royal Academy on the 10th inst. For Mr. Poynter's previous lecture (on Egyptian Sculpture) see *Builder*, pp. 338, 360, ante.

there is never in their works the slightest indication of a fold, and the drapery, always represented in the same conventional forms, defies any attempt to understand the definite arrangement of the stuff.

I do not know that it is necessary for me to go into any detailed description of this Assyrian sculpture, which you must all know so well. Sculpture in its more extended sense, that is, statuary in the round, can hardly be said to exist; such statues as have been found are so flat and slab-like in form that they rather resemble high reliefs detached from a wall, than fully rounded figures; and the winged bulls and lions are of the same character. The Chaldean statues, which were apparently made in greater numbers, have the same block-like form. The sculpture of the Assyrians, therefore, may be said to consist entirely of the long series of reliefs, illustrating the acts of the kings, with which we are all so familiar. Two elements are wanting in their treatment of the human figure, without which no art can appeal strongly to us,—the element of beauty and nobility of form, and the element of portraiture. In the details of the human figure they love to dwell on all that is most antagonistic to beauty; huge and strongly-marked muscles and knotted veins are the first features that strike the eye, and formidable strength is the only impression which they convey. The forms of the winged bulls and lions, which display an imposing but savage grandeur, are mere uncouth maps of an ill-understood anatomy; which would appear to constitute with the Assyrians their idea of a monumental treatment, for their lions, when represented as natural beings, are less exaggerated, and show much observation and a true feeling for nature in the details, as well as in movement and expression. Portraiture there is none; from the time of Assurnazirpal, whose statue is in the British Museum, to that of Assurbanipal, a period of over 300 years, there is absolutely no change in type of face, which, sometimes with a beard and sometimes beardless, is given indiscriminately to all their figures; the differences which exist between one face and another during all this time being due only to the slight modifications of style which took place, and to such varieties in the execution which are unavoidable. The representation is true to the Semitic type, and that is all; it is totally destitute of individuality. What this type is in these sculptures we all know: thick bushy hair, and beard growing almost up to the eyes, fierce thick eyebrows meeting over the aquiline nose with its thickened nostrils, sensual lips, and a half smile, which is far removed from the peaceful and dignified smile of the Egyptian monarch, and seems only sensual and cruel,—this face expresses a character which appears devoid of all that makes men admirable or amiable, and which, as the scenes in their historical reliefs show only too plainly, was not only dead to humanity, but took pleasure in the most hideous cruelties. An art dependent for its attractions on beauty of form cannot be expected from such a race. As regards composition, except for a certain rhythmical arrangement of the figures of the gods, which are terrible and imposing, and well-designed to fill the space they occupy, and a fine and original disposition of the wings in grand and sweeping lines in their winged figures, their reliefs are in far greater confusion than with the Egyptians; the groups and figures are scattered over the ground as in a map, without attempt at order or harmony. On the other hand, the soft alabaster in which these works are executed lends itself to great minuteness of detail and freedom of execution, which we find rising in the time of Assurbanipal to the highest perfection of delicacy and finish; and I need not expatiate on the well-known hunting-scenes, in which all animals,—horses, dogs, gazelles, wild asses, and, above all, lions,—are rendered with such an extraordinary life and fidelity to nature, that some German critics have attempted to account for it by suggesting that Greek artists may have been employed on them; a suggestion which I should have thought would hardly bear examination, considering the more than primitive condition of the arts of Greece in the middle of the seventh century B.C. It has been well pointed out that advance in the treatment of the human form was impossible among a people who seem to have gone entirely clothed. Even the labourers and slaves, shown in such numbers on the monuments, wear a tunic reaching from the neck to the knees. This dislike

to nudity, even in the hottest climates, appears to be characteristic of the Semitic races; for the Arabs of the present day envelop themselves from head to foot, while the Egyptians and Nubians go nearly naked. Another cause of the absence of any efforts at beauty is the genuinely Oriental custom of suppressing the female sex; there is, except among the prisoners of the conquered races, no representation whatever of a woman on the Assyrian monuments, with the one exception of the relief in which Assurbanipal is seen feasting with his queen; a case so anomalous that it has been supposed that this queen must have reigned conjointly with the king in her own right, and therefore, have been entitled to a place in the record of the acts of the sovereign. Small nude figures in terra-cotta and ivory of the goddess Istar have been found, which are too hideous and repulsive for description, showing no ray of perception, I will not say of beauty, but of the most ordinary symmetry.

The sculptures from the palace of Assurbanipal close, as I have said, the history of Assyrian art, which now ceased to exist.

It is not known whether an independent Chaldean art continued to flourish during the time when Babylon was subject to Assyria, and the want of monuments of the last Babylonian empire prevents our having any clue to the style of art practised under its rule. But the original Chaldean sculpture looks like an art capable of expansion, and I cannot help thinking that I see in the figures from the sacred way at Branchidae, which Mr. Newton told you were executed about the year 600 B.C., i.e., about the beginning of the reign of Nebuchadnezzar, a resemblance,—which may, no doubt, be accidental,—to the block-like treatment of the general form, and to the broad flat folds in the Chaldean figures. But a stronger affinity with both the Chaldean and Assyrian styles of work appears in a number of sculptures, bearing among themselves a close family resemblance, though of varying degrees of merit, which you will see in the British Museum, just before the entrance to the Assyrian and Egyptian galleries, and which came from Idalium in Cyprus. Close under one of the human-headed bulls on the left, and, no doubt, purposely placed in conjunction with it, is a bearded figure of a man or deity, so like it in general type and in the detail of treatment of the hair and beard, that an independent origin is impossible; the only differences we find are a greater refinement in the face, in which the Semitic type is less pronounced, and a genuinely plastic treatment of the drapery, though the folds of the upper garment still have the thin flat character that we see in the Chaldean, while the thin tunic is represented by fine wavy lines, which well render the texture of the thin crinkled stuffs still woven in the East, and which form the habitual dress of the boatmen who row the caïques on the Bosphorus to this day. Also, in a number of female heads called Aphrodites, the hair is again identical with the Assyrian,—a double row of locks is arranged with perfect regularity over the forehead, each composed of three straight lines and a formal curl at the end. Cyprus was, as I have no doubt you know, a Phœnician island, and the Phœnicians adapted art of all kinds, Assyrian and Egyptian, and, in later times, Greek; and I do not know whether these fragments, which fill two or three cases in the Museum, are considered to be of Phœnician or Greek workmanship. Much depends on the time when they were executed. Cyprus fell into the hands of Sargon, king of Assyria, in the year 708 B.C., the population remaining Phœnician; but forty years later, when it is still paying tribute to Assyria in the reign of Assurhaddon, the names of the ten kings who reigned there, and are mentioned in an inscription, are mostly Greek; and among them is Agisthus, king of this very Idalium. Mrs. Mitchell, in an important and exhaustive history of ancient sculpture newly published, relying, I suppose, on German authorities, makes them Phœnician, and places them as late as the middle of the fifth century. My own impression would be that they are decidedly earlier, that they are Greek, and that the association with Assyrian workmanship is evident; and that in any case they form an important link between Assyrian and Greek art. A further important relation between Assyrian, Phœnician, and Greek art is to be found in the attributes of the gods, into which I need not enter. I will merely refer to the fact that the goddess Istar, whom I have already mentioned, was the

original of the Phœnician Astoreth, who became the Aphrodite of the Greeks, the centre of whose worship was at Paphos, in the island of Cyprus. But whereas Istar was, as we have seen, represented naked by the Assyrians, she is clothed from head to foot in these Cyprus statues, and was never divested of drapery by the Greeks until the time of Scopas, who, as Pliny tells us, made a naked statue of Venus about 420 B.C., previously to the celebrated statue made for the people of Cnidus by Praxiteles.*

ARCHITECTURAL ASSOCIATION.

SHAMS.

At the ordinary meeting of this Association held on Friday, the 14th inst., Mr. Cole A. Adams, the President, occupied the chair.

The following gentlemen were elected members of the Association, viz., Messrs. F. W. Marks, R. W. Sampson, H. G. Driver, C. H. Driver, J. P. Oliver, C. J. A. Steven, J. G. Hart, C. A. Chambers, D. Q. Blow, and H. Messer.

A vote of thanks was passed to Mr. Gribble for allowing the members to visit the Brompton Oratory, and it was announced that the next visit would take place this Saturday, the 22nd inst., to the Scottish National Church, Pont-street, Belgravia.

Mr. A. B. Pite presented a copy of the "Sketch-Book" of the Architectural Association of Boston, which had been forwarded to him for presentation. In doing so he proposed a vote of thanks to their professional brethren in Boston. He added that if the members looked into this elegant sketch-book he believed they would tremble for their spurs, and he hoped it would stimulate them to do their best, or they would be in the uncomfortable position of finding that others could do better than themselves.

The Chairman, in putting the vote, remarked that perhaps Mr. Pite was too ready to surrender the palm to their American cousins. They had a great many men among them like Mr. Pite, whom he would not mind putting forward as an example of what the Association could do.

Mr. Hampden W. Pratt then read a paper on "Shams," going over much which has been said very often before in regard to truthfulness of design in building, and the necessity of the exterior design representing the interior arrangement; and concluded with the following remarks as to the use of certain special materials and methods:—

Coming now to the question of materials for building purposes, one must express regret that buildings are fast losing their local character, owing to the increased facilities for bringing materials from distant parts. I am not prepared to say that there are no advantages in this, but I think we should, when possible, make use of suitable materials at hand, and not go out of our way quite so much to introduce one thing and another. The question of using the right material in the right place, and for the right purpose, ought also to receive at our hands a great deal more consideration than it usually does. Touching the use of manufactured materials, it may be asked how far it is legitimate to use some of these? Bricks have been made from time immemorial of all shapes, sizes, colour, and contour, but I suppose it was not until the last century that they were shaped and worked after being burned. At the present time there seems to be quite a mania for cut, rubbed, carved, and gauged brickwork, and I would respectfully ask those who defend this treatment whether they really consider it legitimate? It seems to me a strange, not to say wrong, use to make of bricks. Most marvellous productions of the joiner-brick-layer's art may be seen almost anywhere,—bricks cut and carved like soap, and jointed with putty. Strange construction some of this! Terra-cotta has been largely used, and, properly applied, it is a most valuable material. "Artificial" stone does not sound nice, but I think it may be used legitimately for paving, steps, and such purposes; but for moulded and carved work, and where hand-labour should be bestowed, I think natural stone ought alone to be used. Stucco has never been favourably received, except by speculative builders, who, at comparatively small expense, produce with it the forms and details appertaining to stone structures. It is needless to say that this treatment is entirely imitative, and unworthy of adoption by any architect. I will say no more on this point.

* The remainder in our next.

Of iron it is difficult to speak. It is probable that we are at present only on the threshold of its career; but it is to be sincerely hoped that the day will never come when whole iron fronts will supersede brick and stone construction in this country, as in some parts of America. Fancy describing galvanised iron cornices, widow-cills, pilasters, and what not! Such construction seems repugnant to one's sense of fitness, and, as carried out across the Atlantic, must bear a strong resemblance to stone construction. One of our chief faults is in making cast iron to resemble and imitate wrought and hammered work, and architects are very often much to blame in this respect. As a structural material iron is invaluable; but it is now a recognised fact that to withstand fire it must be encased. This concealment we must accept as lawful, though, I admit, not wholly satisfactory; and I think we ought to make some effort to carry out this encasing in such a way as to show the purpose for which it is employed. One word before leaving the subject of iron. I think architects are too fond of substituting rolled-iron joists for brans. If a little difficulty arises in planning or construction, the problem is apt to be solved by the friendly use of iron girders or joists. They are made too much a convenience of, and I think we ought to recognise this.

Half-timber construction calls for some notice. I fear a great deal of the so-called "half-timber" work is considerably more than half brickwork, by which it is so often backed, and a good deal of it is merely a piece of framework 2 in. or 3 in. in thickness. Such construction is not worthy the name, and can only be characterised as sham.

Then as to mouldings in joiners' work, it is getting almost a rare thing to see mouldings worked in the solid. Mouldings are planted on, stuck, and bracketed out without any compunction, brads, screws, and glue taking the place of what was formerly sound, solid construction. I know it will be admitted that you would prefer to have solid moulded work, if expense were no object; but this admission only proves that you endeavour to obtain the effect of solid work by the sacrifice of principle. Why not be content with simpler work legitimately executed?

I have referred hitherto more particularly to what may be termed structural pretences, I should like now to say a word on those more strictly decorative, and it is in this direction where imitations abound. Marble being a costly material is in great demand, and there is an abundant supply of clever imitations. It surprises me to see architects so frequently using scagliola; it is a downright sham, of course, and so are all the marbles made of slate, and it would be a great blessing if all this false stuff could be swept away. Chimney-pieces, perhaps more than anything else, are conspicuous features in a room, and how often they are constructed of false material, and boxed out to appear solid! If people are accustomed to endure false things at their hearth, no wonder they will put up with, not to say revel in, all sorts of imitations and deceptions elsewhere. The marble mania also extends to painting or marbling, even to the absurdity of making a metal bath resemble marble. Porcelain is also marbled, and the difficulty is sometimes to obtain goods of this class which are not imitations.

Graining is an old device, and seems never likely to die out. Trade decorators are perhaps most responsible for its survival; give such a man *carte blanche* to decorate your house, and I believe he would grain or marble it from top to bottom! Of late years a good deal of walnut wood has been used, and now walnut instead of oak graining is beginning to be used. If our friend the decorator takes a fancy to this sort of wood we shall one day be nauseated with walnut graining. It is a poor excuse which people offer for graining when they say that it is done to preserve the wood, and wears ever so much better than paint. One thing they omit to add is that the woodwork grained is of an inferior kind to that imitated—herein is the dishonesty. I do not say that one is deceived into believing that the graining is the natural wood, but it is none the less a fraud. What shall we say, too, for veneering? Veneering of wood hardly comes within the range of architect's work; it is more in the cabinet-maker's line, and it is to be hoped architects will give no countenance to this method when they are called upon to design furniture.

But we are often concerned not only with things we design, but with articles we select, and it is necessary that we should follow the same principles in one as in the other. The market is flooded with imitations of all sorts; we must be on our guard lest we unwittingly encourage the manufacture of that which is false. It is within our power, possibly, to create and maintain a healthy tone, and we should let no opportunity pass for condemning what we believe to be bad and unprincipled. There is more temptation to produce imitations with the manufacture of new materials, or the introduction of new inventions, and, therefore, we should carefully watch such, and give no encouragement to things of a doubtful or dishonest nature.

With the general adoption of the electric light, we shall be called upon to consider the appropriateness of fittings for it. We are too conservative in this respect, I think; there is too much resemblance, for instance, between the fittings used for candles, gas, and the electric light, and imitations easily creep in. An example of what I mean you will find in the Arbitration Room in this building, where the gas in the chandelier passes through imitation candles,—a very senseless contrivance, I think. I do not know who admires such things,—I should not think architects do; and yet this particular chandelier is placed in a room mostly used by such. But probably you will not attach much importance to that; for you will no doubt agree with me that the ventilation of this room is a sham, and, if we were anybody else than architects, I expect we should have called for or applied a remedy by this time.

In the discussion which followed, The Chairman said that the question as to what were shams was one of considerable magnitude. There was no doubt that the influence of locality upon work was being rapidly lost, at the same time that the local characteristics of men were being swept away. The result was a kind of levelling-up, which the artist must regard with regret. Materials were now brought a long distance for the construction of a house, but in course of time additions or repairs had to be made with different materials, the result being a want of continuity in the building. Mr. Pratt had run a tilt at gauged brickwork, but he could see no sham in moulding or carving a brick which was specially prepared for that purpose. In the matter of durability too, the carved and gauged brickwork of London would stand better than stonework. He could instance some pieces of Queen Anne work in the metropolis, which was as sharp as when first cut. In regard to concrete, again, he saw no reason why it should not be employed, cast into forms giving durability, a perfectly water-proof surface, and a large saving in money. Iron seemed to meet with the general condemnation of architects. They were told by purists that it should be shown, but he might remark that the framework of our bodies had been covered with flesh by the Divine Architect. Then came the vexed question of marbling and graining, and on this point the feeling of the members appeared to have changed of late years. He had defended graining some time ago. There was nothing which wore so well, and it went with anything which was not extremely æsthetic. Graining was one of the characteristics of the English people, and, as a general all-round decoration, it was the best. Exquisite effects could be got on a large scale by using veneering, when the cost of wood in such cases would have been quite prohibitive. Mr. Burges had even proposed to veneer St. Paul's with marble slabs.* The Chairman concluded by observing that in a too great desire for truth they might overstep the mark.

Mr. Pite remarked that a distinction should be drawn between imitations and shams. Imitation was the sincerest form of flattery, and they could imitate without falling into the use of shams. Mr. Pratt had referred to many things which were good in their way. Graining was practised because of its good wearing nature, and stucco was used on account of its being waterproof, and especially useful at sea-side places. As to graining, if a man liked black marble, spotted with yellow, there was no reason why he should not imitate it. The old Queen Anne plaster work was plaster work for its own sake. All great artists had made use of shams, and the greatest works had some

* *De summis ad nihil bonum.* It is true that Mr. Burges did make that monstrous proposition, but it is hard that it should be remembered against him.—Ed.

shams in them. The genius of a real architect endeavoured to rise above the mere confines of utility and the requirements of his building. He might instance the dome of St. Paul's, while the man who planned the front of Peterborough Cathedral was a real genius, working out as he did a most beautiful poetic idea, having no relation to the building behind. Mr. Pratt would have to denounce these and such buildings as Salisbury and Lincoln Cathedrals, if he insisted on the interior of the building forcing itself to the outside. When a man wished to rise to a grand gift of poetry he was often met by the remark that it was not truthful. The speaker concluded by proposing a vote of thanks to the lecturer.

Mr. Stannus seconded the vote, and added that many things which had been called shams deceived nobody, nor did they pretend to deceive. He agreed with the chairman in the matter of graining. Combing had the effect of hiding the work without suggesting an elaborate grain. One saw everlasting swaggery on much of the Queen Anne stuff which had been put up in London, and he sympathised with Mr. Pratt in his denunciation of this. With regard to stucco he could see no reason why it should not be used. He could imagine a building with terra-cotta window dressings and corners, and that portion of the screen which went from pier to pier to enclose the building might be covered with stucco, rough-cast, or plaster treated in a sgraffito manner. As to veneer, so long as it was kept to panels and the edges clipped by the mouldings of the stiles, there was no reason why it should not be used. Mr. Burges found that in decorating Worcester College Chapel marble gave a halo of changing colour which no other material could afford. It was the changefulness of colour which, in Mr. Ruskin's eyes, gave it beauty. There was a great deal of sham in this sense in Worcester College Chapel, but it was not shameful. Many people had an idea that rudeness was truthfulness, but the test ought rather to be whether the deceptive intention were present, and, in the majority of instances, this was not the case.

Mr. J. A. Goteh thought it was well to have the ideal put before them. In the Association they might strive for the ideal, while upstairs in the Institute they might carry out the practical as well as they could. Architects were compelled, to a great extent, to carry out the views of their clients. Some years ago he had intended never using enamelled slate mantel-pieces or graining, but he had been compelled to modify his intention. It would be a waste of money in many cases to have mouldings in the solid, and mired mouldings were a distinct advance in the art of joinery. He congratulated Mr. Pratt upon his paper, and considered that, although they might not attain the height which he had indicated, they might, at least, get up to the first landing.

After one or two other remarks the resolution was put and carried.

Mr. Pratt, in making a short reply, admitted that his view was rather an ideal one, but if it could not be realised, it was an advantage to try to get half way.

ACTON DRAINAGE.

THOUGH the parish of Acton is in the Thames valley, and its northern boundary not much more than half a mile from the banks of the river, it has hitherto been entirely independent of that great water-way as a sewage outlet. Acton has never come under the view of the Thames Conservancy Board in their efforts to keep the river free from pollution by sewage and other excrementitious matter. Richmond, Twickenham, Chiswick, Hounslow,—in fact, all the parishes within the district of the Lower Thames Valley Sewerage Board,—have been recipients of many warnings on the point from the Conservancy Board. These had no retrospective application to Acton. Still that parish is at present in the midst of the throes of an excitement over a new drainage scheme for the district, which is probably as much in want of proper means of drainage disposal as some of those parishes in the district of the Lower Thames Valley Sewerage Board. By the Act of 1855, the Metropolitan Board of Works were empowered to utilise, as carriers of sewage, certain brooks or rivulets flowing into the metropolitan district; and one of these, Stamford Brook, on the western boundary, was so utilised. Acton, which is just outside the

metropolitan area, was then a small village of very few houses; now that village has become a thriving town of considerable dimensions, with a population of about 20,000. With the increase of this town it soon became a question with the Metropolitan Board whether they should continue to allow the sewage, — now considerably increased in volume, — to flow, as heretofore, into this brook, thence into the Metropolitan system, and so increasing the expense of pumping at Barking, to which process Acton contributed nothing. A case was tried which led to the important decision and interdict of Lord Justice Fry, which was to the effect that the sewage only of houses existing in Acton at the date of the injunction was to be allowed to flow into this brook; while the sewage from houses built subsequently to that date was to be excluded. Deprived, so far as the future was concerned, of the outlet which it had used from time immemorial, Acton was placed in a curious, if not serious, position. It obviously meant the construction of a comprehensive and complete scheme of drainage for the whole of the parish, even though Acton had the advantage still reserved to it of the use of the old outlet so far as existing houses were concerned. If all additional new houses could have been erected together in one part of the parish, then it might have been possible at comparatively small expense to construct a system which would meet the sanitary requirements of the new houses. But Acton, like most suburban towns, is increasing on all sides, and drains must be laid along the newly-formed streets in whatever part of the parish they may be. That being the case a complete system for the whole of the parish seemed almost a necessity, and it was natural that the local authorities there should still try to come to some arrangement with the Metropolitan Board. Soon after the issue of the injunction above referred to the Local Board endeavoured to open negotiations with the Metropolitan Board on the basis that if the latter permitted the Acton authorities to put the whole of the sewage of the parish, — both of the houses existing and to be built, — into the Stamford Brook, Acton would withdraw the great volume of storm or surface water which flowed into the Stamford Brook, and which added materially to the cost which the Metropolitan Board had to pay for pumping at Barking. It is computed that 10,000,000 gallons per day of storm-water, gathered not only from Acton, but from the wide upland districts of Harrow Hill, flow into this brook. It was argued, and not without some reason, that it would be an advantage to the Metropolitan Board of Works to be relieved of this great volume of storm-water. But the Metropolitan Board in explicit terms informed the Acton Board that it would not open negotiations on any basis which would involve the admittance of fresh or additional sewage into its system. There seemed no alternative but for the Local Board to rely on its own resources, and the local surveyor, under the guidance of Mr. Bailey Denton, was instructed to design a comprehensive scheme and prepare plans for the same. This scheme included a complete system of sewers, the erection of a pumping and sewage station, from which the effluent was to flow, by means of a culvert, into the river Thames. The Acton Board proceeded forthwith to apply to the Local Government Board for sanction to borrow 75,000*l.* with which to carry out the scheme. Several sittings of an inquiry by Major Talbot, inspector, have been held on the subject; but the inspector had submitted to him at the outset a very important, though subsidiary, question by several owners of estates in Acton, viz., how to provide temporary means of sewage disposal for the new houses built subsequently to the date of the injunction by Lord Justice Fry. After evidence was taken on this point the difficulty was got over by the Local Board undertaking to give this temporary relief by means of cesspools, at its own expense, until the permanent drainage system was completed. Meanwhile a large body of the ratepayers had become alarmed at the proposal to spend so considerable a sum as 75,000*l.* on a drainage system. Public meetings were held, and a Ratepayers' Drainage Committee was formed. This committee have had interviews with the Metropolitan Board, and they have managed, where the Local Board failed, to re-open the question. It is now regarded as a significant fact that Sir Joseph Bazalgette, Engineer to the Metropolitan Board, has been recently appointed consulting engineer to the Acton Board in its present

difficulty, while Mr. Bailey Denton has been requested mean time to suspend operations in regard to the scheme in embryo. The Metropolitan Board have already so far shown their disposition to treat with Acton in the temporary concession which it has made in allowing a part of Acton (Bedford Park) to drain into Stamford Brook, by means of the new deep sewer recently laid in that estate, which, along with the pumping-station, were then rendered useless by the injunction of Lord Justice Fry. Bedford Park, having to depend for its drainage on the old shallow sewers, which were in an inefficient and dilapidated condition, though running into the Stamford Brook, has been placed at a disadvantage, from a sanitary point of view. It is understood, now that improved drainage has been introduced, building operations at Bedford Park, which have long been at a complete standstill, will be renewed. There is now reason to believe that the Metropolitan Board of Works will enter into negotiations with the Acton Board with a view of arriving at an arrangement by which the whole of the sewage of Acton will be kept out of the metropolitan system, in which case the Metropolitan Board would necessarily pay compensation for the relief. It is also considered probable that, once the Metropolitan Board is relieved of the Acton sewage, it will divert the Stamford Brook (which, under the suggested arrangement, would contain but storm-water) into the river Thames, by means of a new culvert, and thus save the useless expense of pumping at Barking the large volume of stormwater which at present passes into its system through the Stamford Brook.

WINDOW IN CHURCH OF SS. GIOVANNI E PAOLO, VENICE.

Sir, — As you have been good enough to have the drawing of St. George from the window of the Church of St. John and St. Paul, Venice, engraved, I thought it might interest your readers to know something of the circumstances connected with it, and to have some information about its designer.

As I could find no illustration of this beautiful window, the delight of all artists visiting Venice, I determined, if possible, to get a drawing of it made, to show in my lecture at the Royal Academy on Coloured Glass*; but I ascertained that the window was boarded up during the repairs of the church. Thanks to the Venetian architect, Signor Giacomo Boni, a descendant of one of the Bons who designed the Ducal Palace, enough of the boarding was removed to get the compartment of St. George copied, which was done by Signor Alessandri under the most unfavourable conditions, that of the weather not being the least. There is reason to believe that the window is not of stained glass, but merely painted in varnish colours on the glass, and not fired. I append a translation of the parts of Signor Boni's letter relating to the works of the Vivarini, and possibly some of your readers may be able to answer the questions.

GEORGE AITCHISON.

No. 150, Harley-street, W.

The Vivarini, a family of the island of Murano, near Venice, produced a series of artists, who started a new style in the Venetian school; the most celebrated were Antonio and Bartholomew; about the last, Vasari writes, in his *Life of Carpaccio*: "Bartholomew Vivarino, of Murano, did very well in the works he executed, as may be seen in the picture that he painted for the altar of St. Lewis, in the Church of St. John and Paul, as well as in many others."

Under one of the figures in the picture at St. John and Paul one reads, "Bartholomew Vivarinus de Muriano pinxit 1473." The large window of painted glass, on which are shown St. George, St. Theodore, the Virgin, Doctors, and Dominican Saints, was executed from the cartoons of Bartholomew; in 1814 the window was restored (they write *renewed*), but I hope to be able to show how much remained of the original work (of the St. George, amongst the others, the former of which you have already received), and that Vivarini not only furnished the cartoons, but painted the glass himself. In the St. George, it is true, there are restorations, as in other parts of the window, which are easily recognised by the colour, which has not the force

of the original, and may be washed off, while the original adheres surprisingly. . . . Other works remain of B. Vivarino, the Madonna and Saints in the picture gallery at Bologna ("Anno Domini 1450, hoc opus inceptum fuit Venetiis et perfectum ab Antonio et Bartholomeo de Murano, Nicolao V., Pont. Max. ob Monumentum R. P. D. Nicolai Card. tit. sanctæ crucis"), which was in the Certosa of the said city. Another picture of the two Vivarini is or was at St. Francis at Padua (but I do not recollect it). In our Academy of Fine Arts we have a picture of Bartholomew's that came from the suppressed Church of the Certosa-in-Isola, and represented a Madonna and child and four saints ("opus Bartholomei Vivarini de Murano, 1464"). At the Royal Museum, Naples, there was another Madonna and Saints ("opus Bartholomei Vivarini de Murano, 1465"). The historian Ridolfi records a Madonna and child, private property, with the inscription, "Bartholomeus Vivarinus di Muriano pinxit, 1473."

In our Church of Sta. Maria Formosa we have a picture in three compartments, painted in 1473-75. In the Certosa of Padua (two miles outside the Codalunga Gate) there was a picture with the epigraph, "Opus factum Venetiis per Bartholomæum Vivarinum de Murano, 1475," which, Moschieri states, was bought in 1775 by the British minister, who sent it to London (I do not know where it is to be found. You will make a real present to our historians of art if you could learn something about it. Perhaps it is already in the National Gallery?).

We had in Venice a Madonna of B. Vivarino, painted in 1475, which was private property, and was sold. In the Church of St. Euphemia there is a Madonna and St. Roch, on a gold ground ("Barth. Vivarinus pinxit 1480-82"). In the Church of the Frari there is a picture in three compartments, with an inscription under the Madonna, "Bartholomæus Vivarinus pinxit 1482" (Ridolfi reads it 1436, and Zanetti, 1487). In the Royal Picture Gallery at Berlin there is a St. George, on horseback, who kills the dragon with a lance, and in the distance is seen the daughter of the King of Libya, liberated by the saint, the inscription says: "Factum Venetiis per Bartholomæum Vivarinum de Muriano pinxit 1455." This picture might be compared with the St. George in the window of St. John and St. Paul, but, as ill-luck will have it, I have neither a photograph, nor a drawing. I may, perhaps, find it published in some illustration of the Berlin Museum. In San Giovanni in Bragola at Venice there still exists a "Resurrection of Christ," cited by Lanzi, in which the inscription has perished. Mark Boschieri read the date 1498. In St. Antonio of Pesaro Lanzi saw a picture with the titular saint and three young male martyrs, under which was the name of Vivarini.

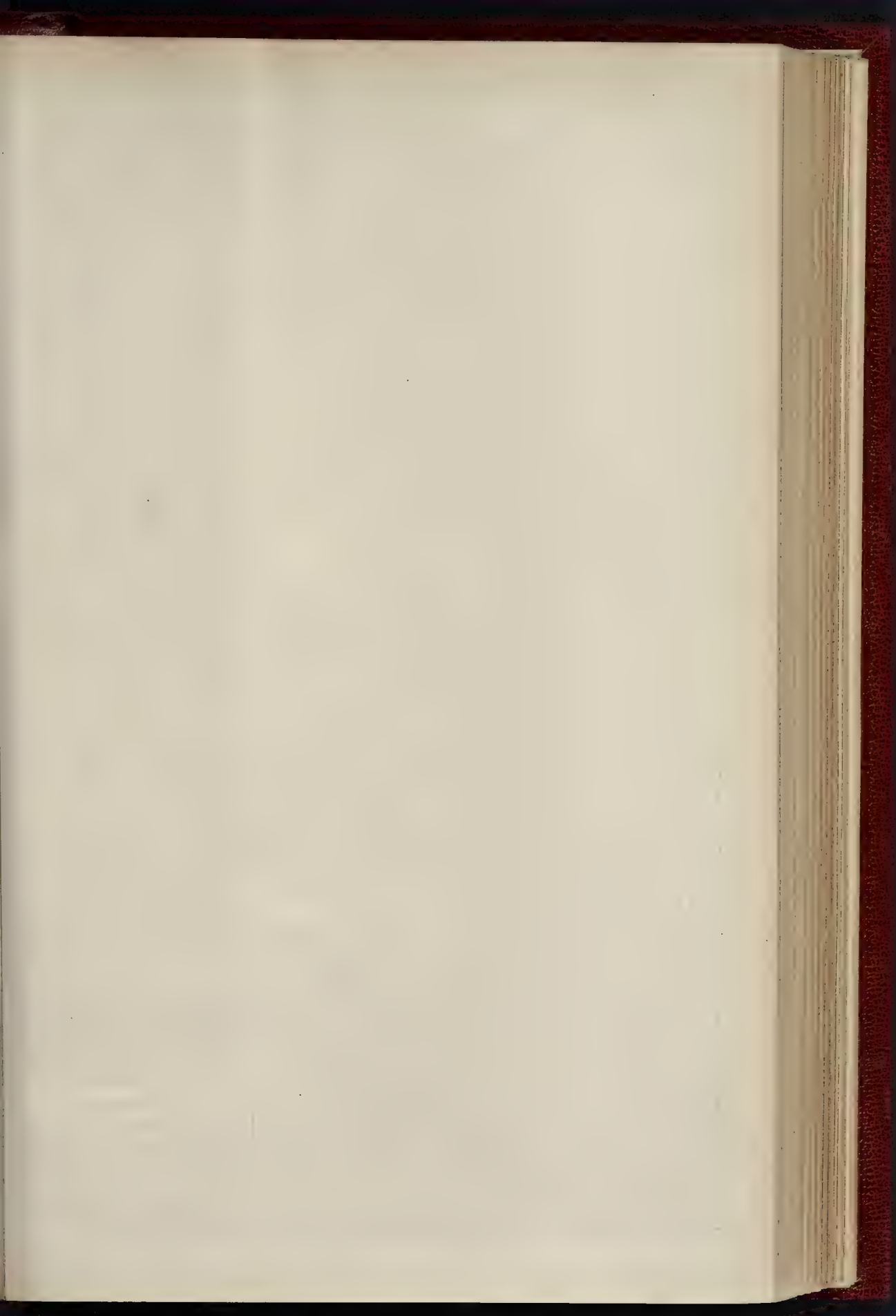
Morelli wrote in German under the name of Ivan Semoloff, and in his book, called "The Works of Italian Masters in the Galleries of Munich, Dresden, and Berlin," he says, "There is also an excellent picture by Bartholomew (who was a potter, and to some extent a pupil of Anthony's) in the Berlin Gallery. I do not mean St. George (No. 1,160), which is only a studio work of the artist's, but the interesting picture in which the Virgin is represented with the child clothed, sitting before her on a balustrade; above her there is a festoon of fruit."

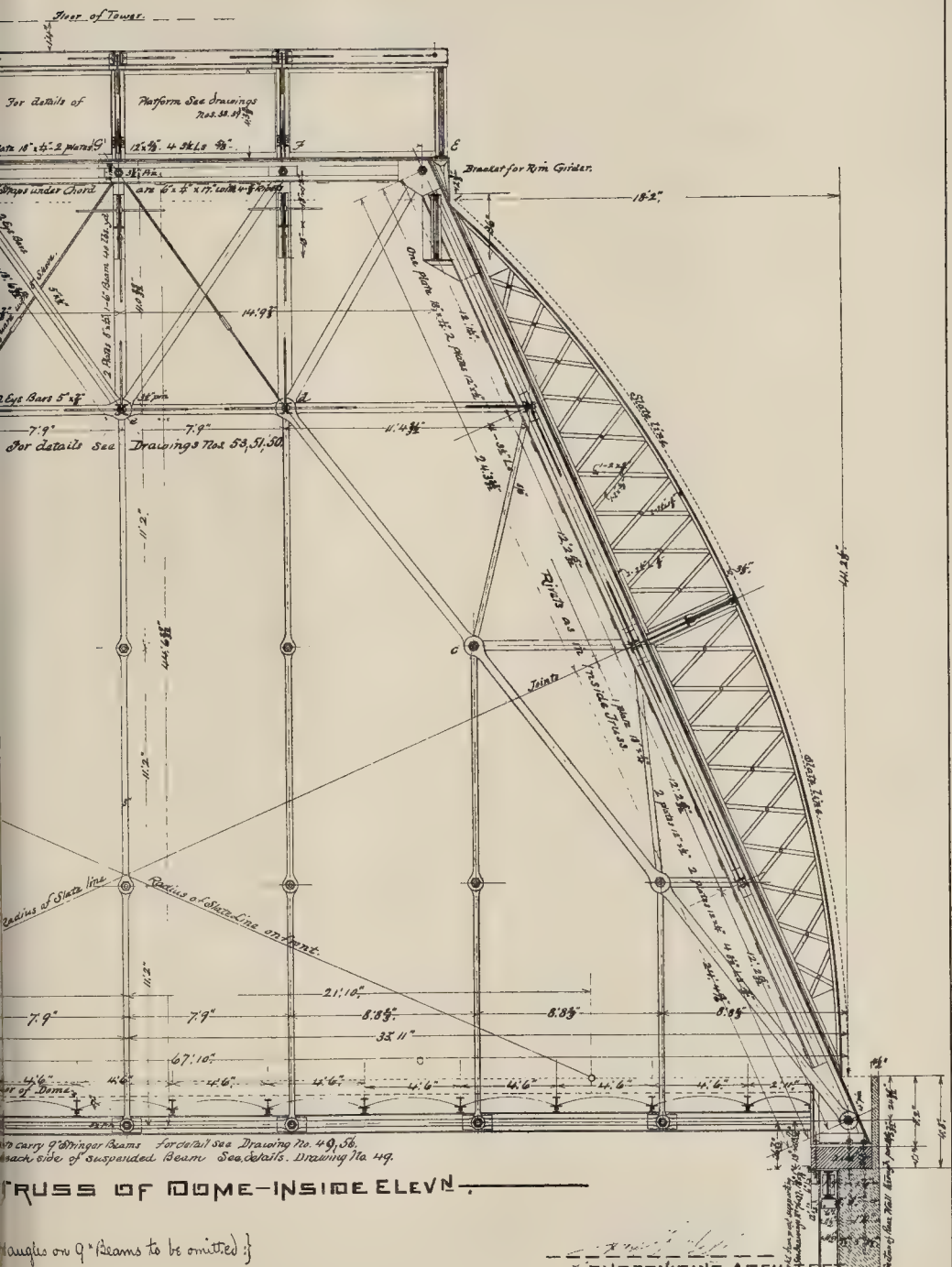
Concerning Bartholomew's works, Morelli also remarks: "The pictures painted wholly by the master himself, or at least for the greater part, never have landscape backgrounds, but either gold or air, and are besides easily discerned, by the accuracy and fineness of their contours and execution, from those painted by his assistants from his cartoons; while the latter are furnished with the inscription, "Factum per Bartholomæum"; the former, — viz., the works of Bartholomew himself, — bear either the inscription, "Bartholomeo de Muriano pinxit," or "Opus Bartholomei de Muriano" (the Venetian School).

The Pepps Memorial.—A mural tablet, placed in the Church of St. Olavo, Hart-street, City, and surmounted by a bust of Samuel Pepps, Secretary to the Admiralty in the days of Charles II., was unveiled on Tuesday last. The American Minister, in a brief address, spoke of the character of Pepps and of the ever-entertaining diary which he had left of his times. The memorial was designed by Mr. A. W. Blomfield, architect, and executed by Messrs. Barry, Son, & Hobbs, of Lambeth.

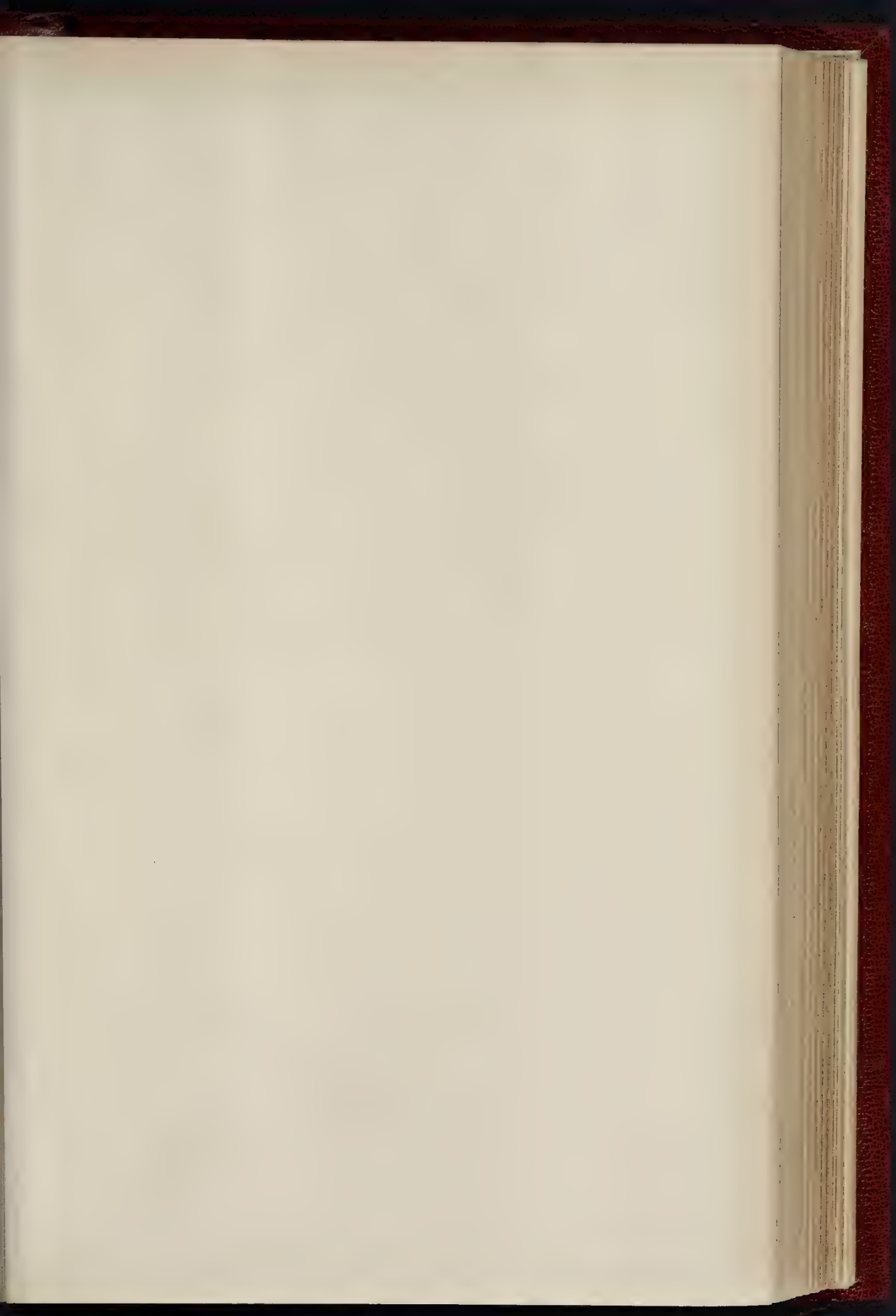
* See *Builder*, pp. 315, 332, ante.

† When the window is uncovered, and I can examine it.





SUPERVISING ARCHITECT
TREASURY DEPARTMENT

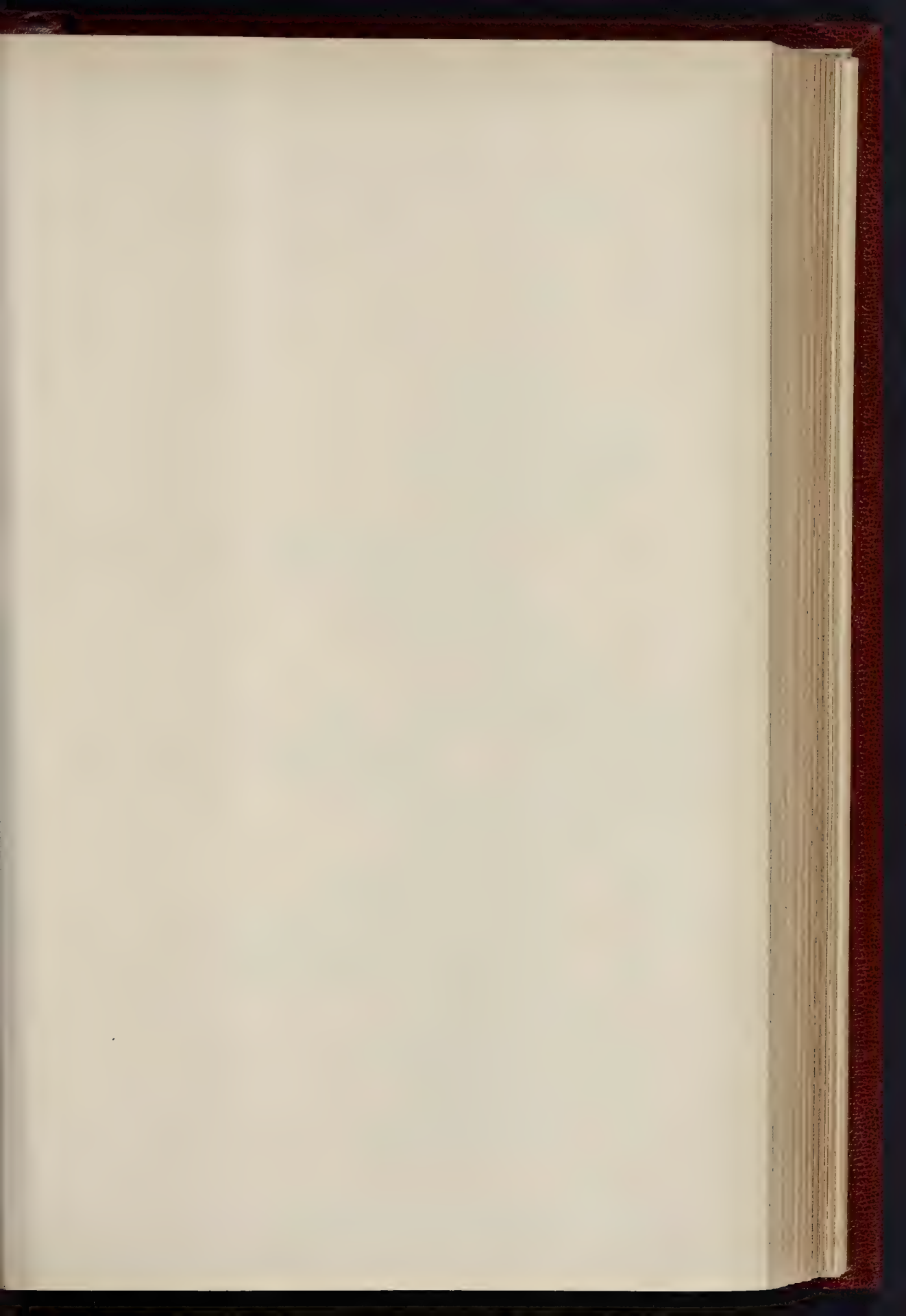


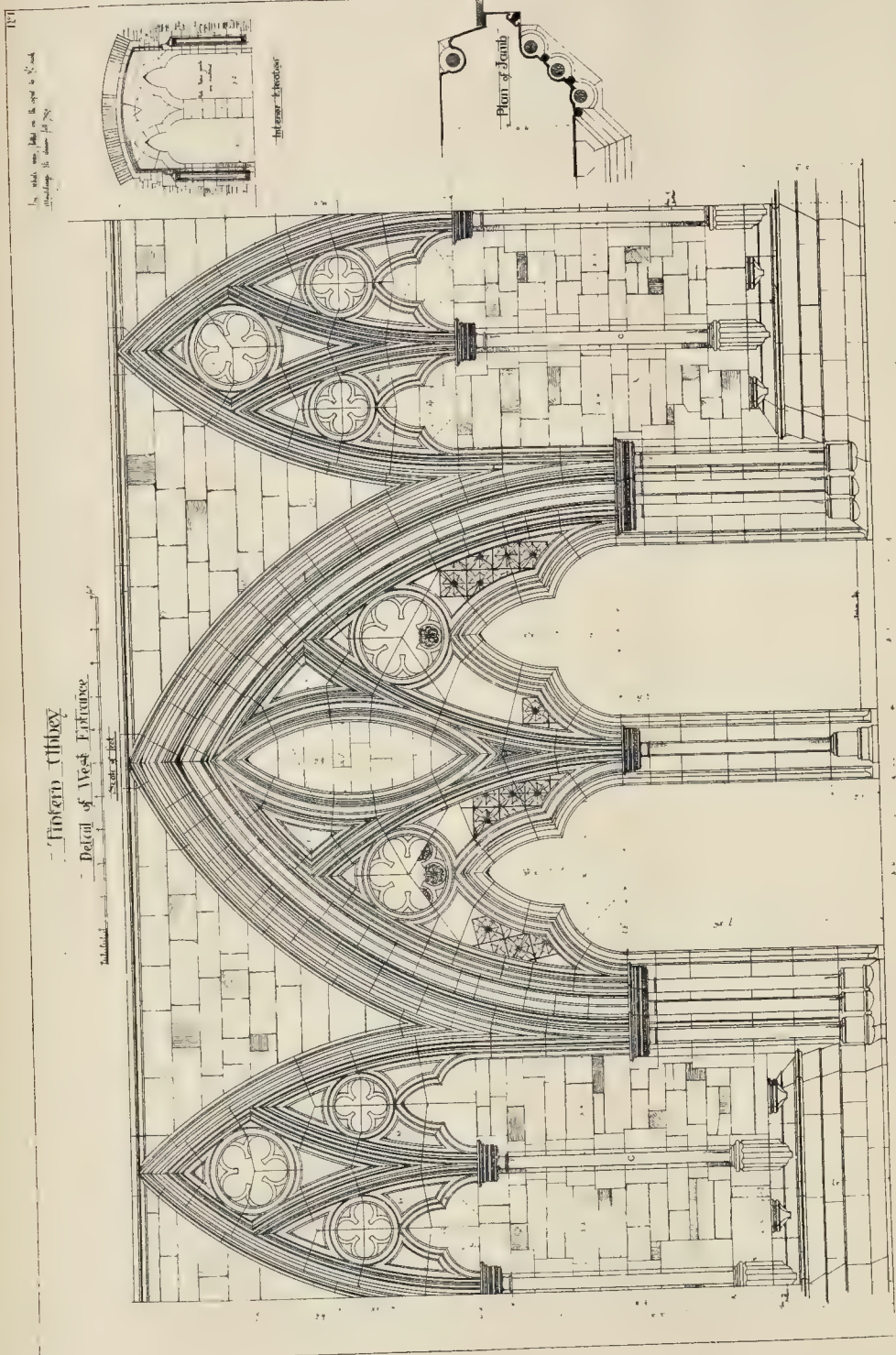


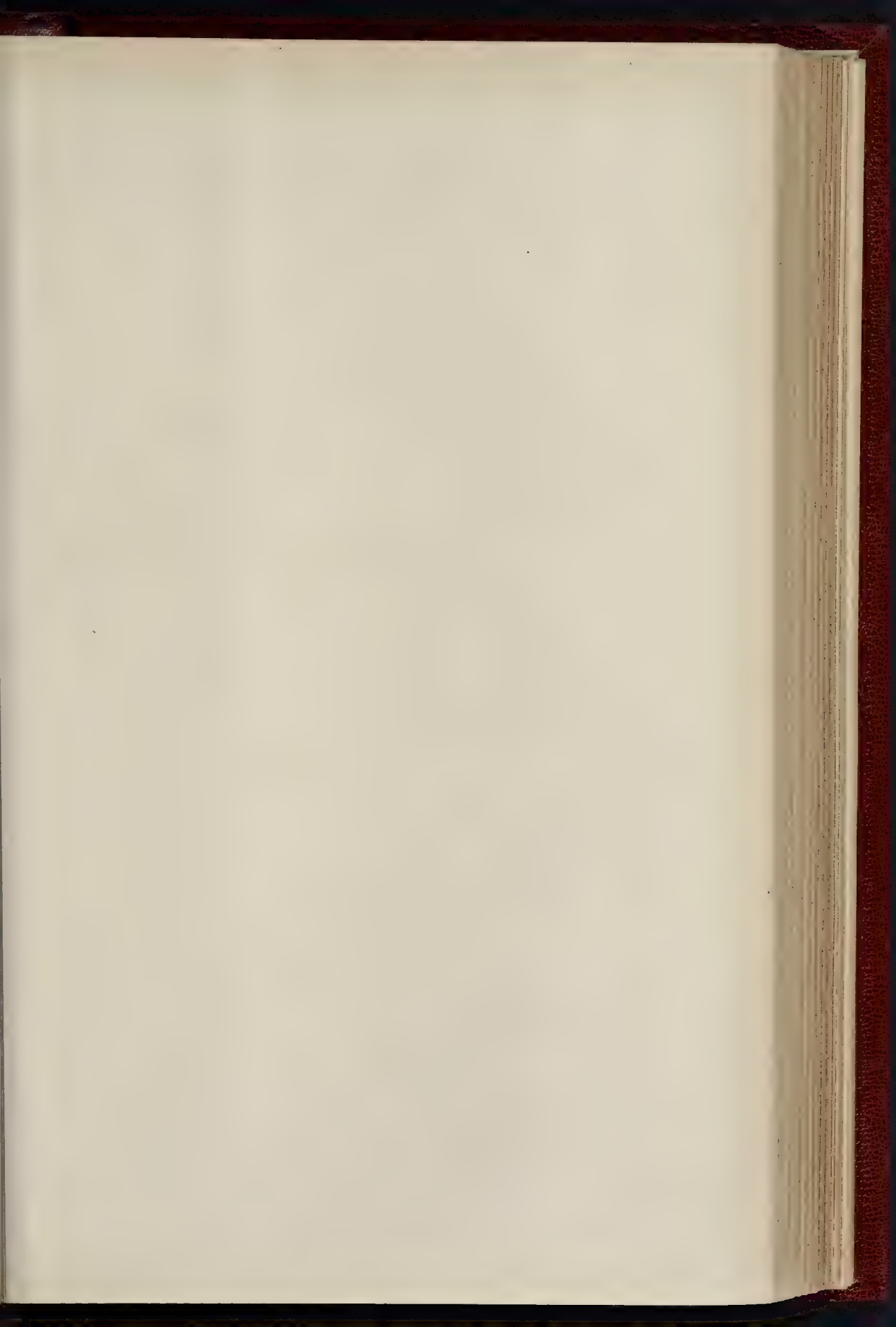
DRAWN FOR LITH.
W. R. LETHABY

FROM A WATER COLOUR DRAWING
BELONGING TO G. AITCHISON ESQ. ARAB.

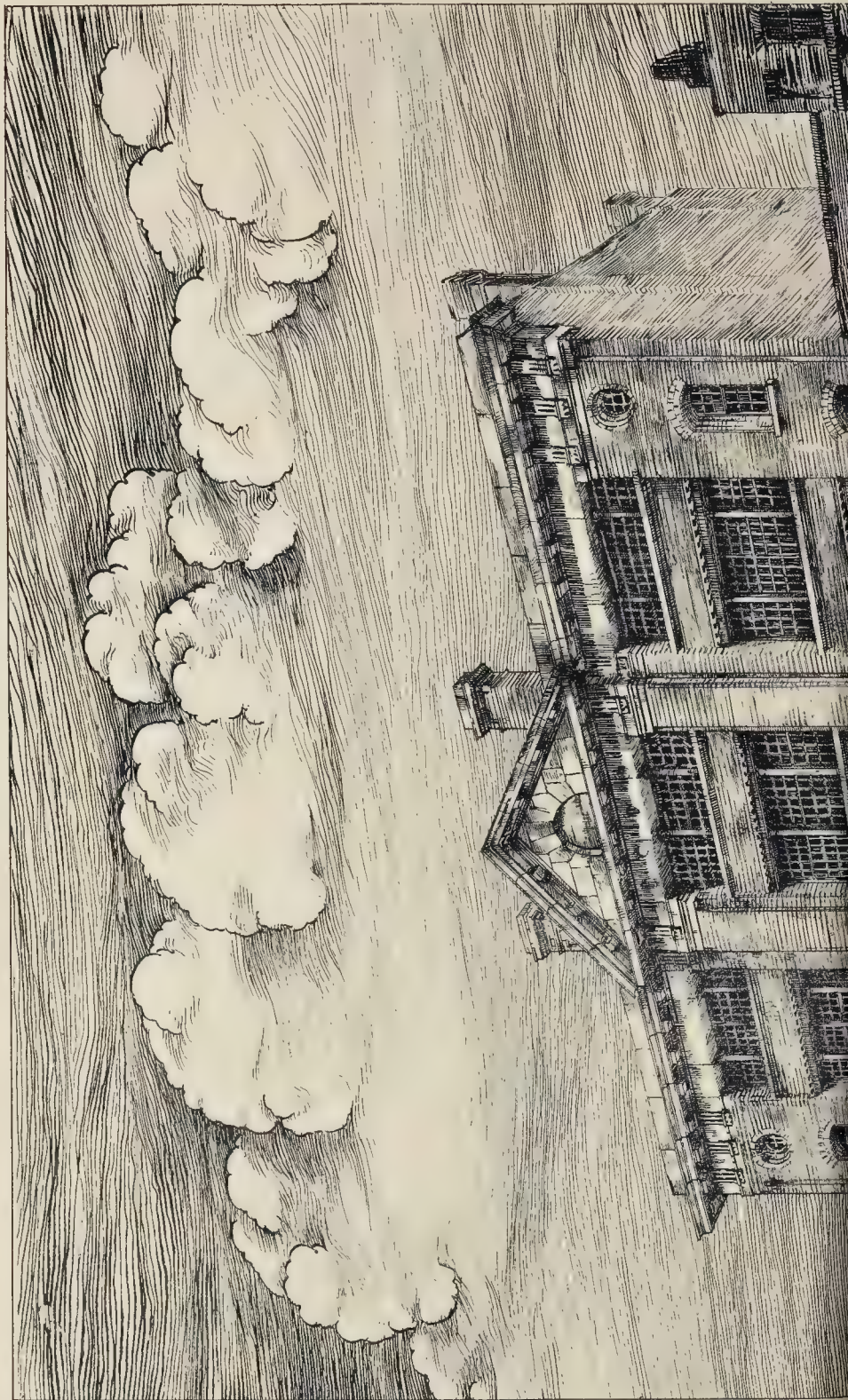
CLERESTORY WINDOW IN SS GIOVANNI E PAOLO, VENICE







THE BUILDER, MARCH 22 1884.





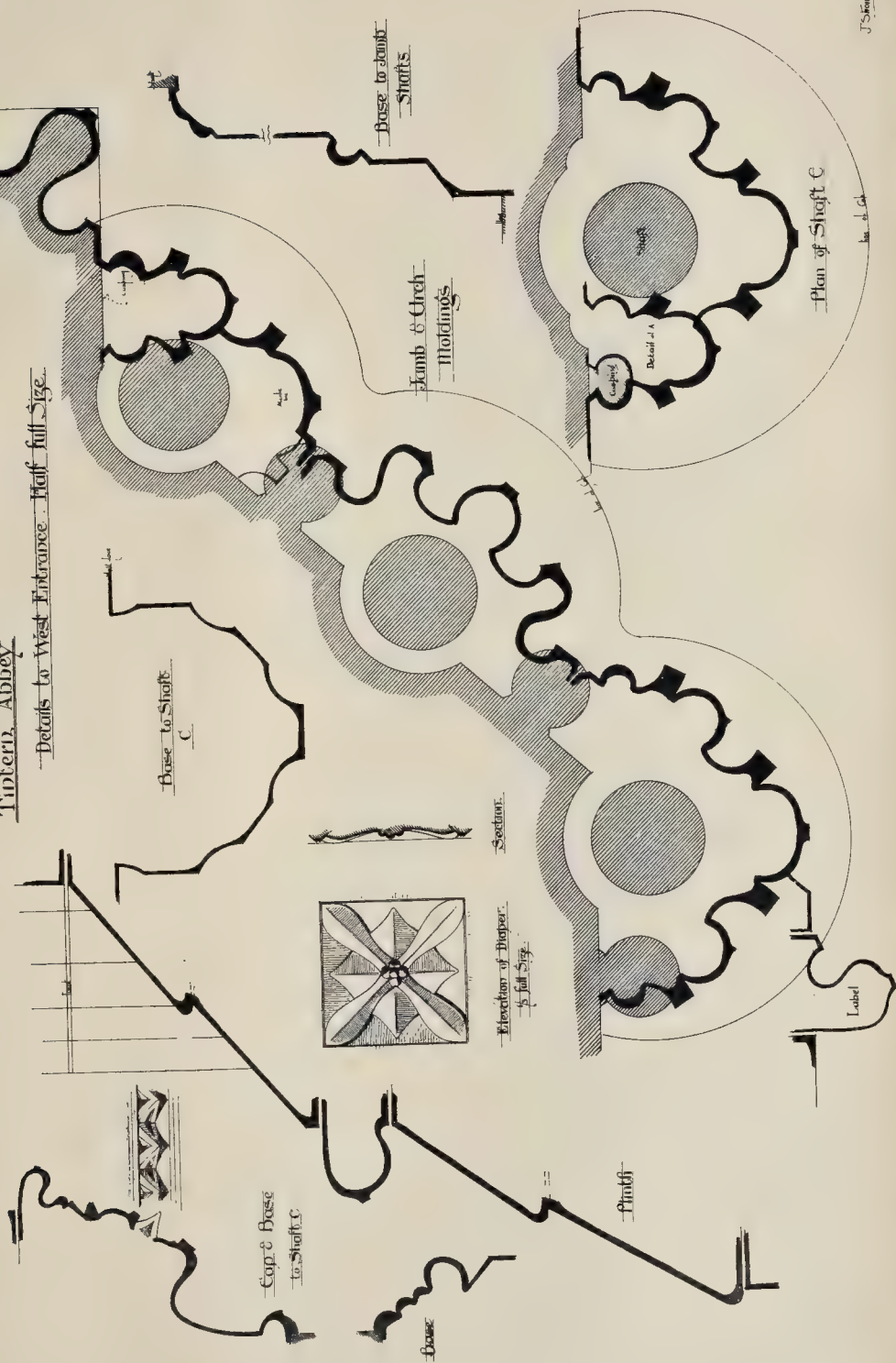
WAREHOUSE, BROAD STREET, BLOOMSBURY.

Designed by H. H. Peacock, Esq.

MR JOSEPH PEACOCK,
ARCHITECT

Tintern Abbey

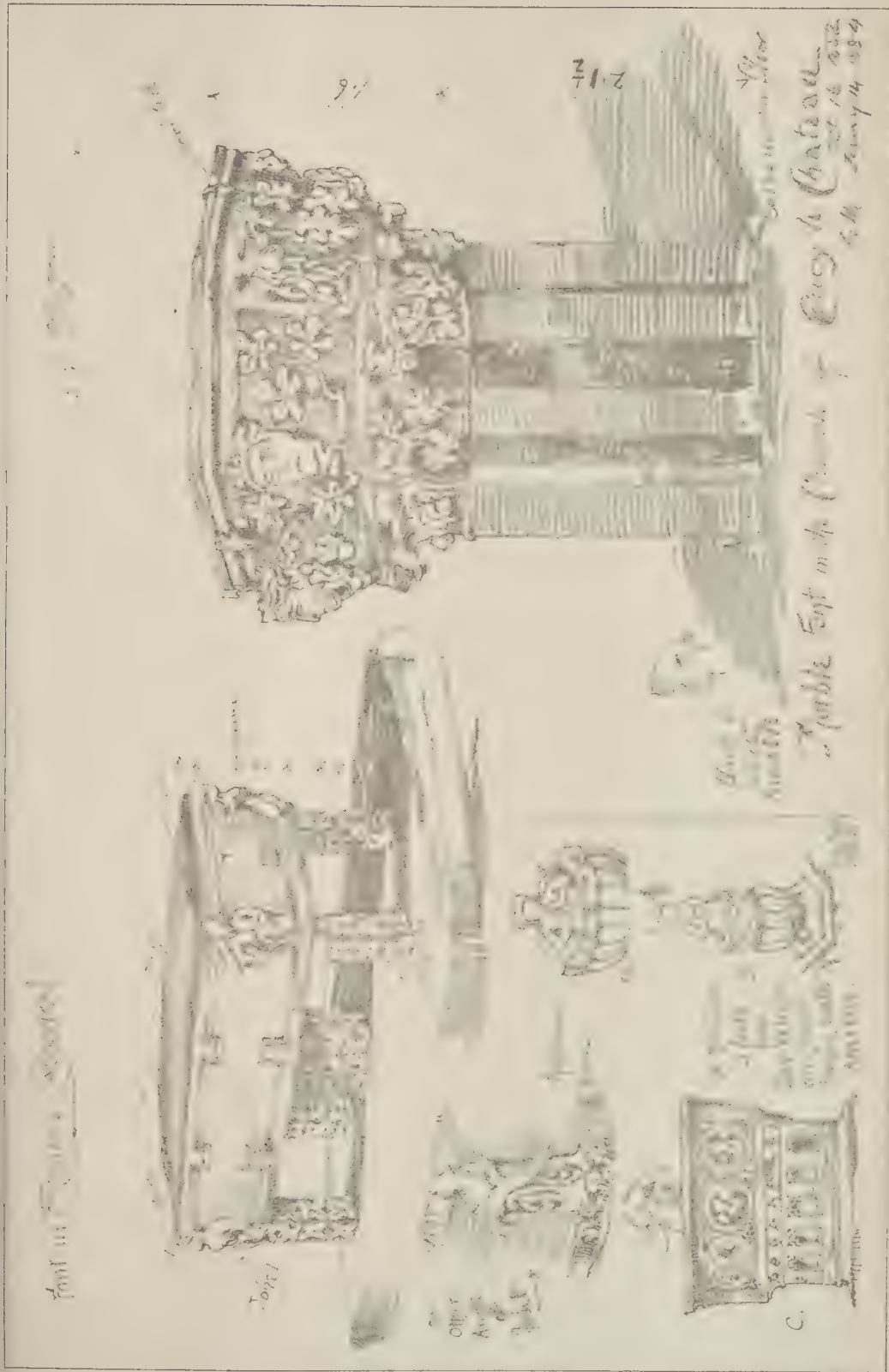
Details to West Entrance. Half full Size.



J. S. Wong

— 300 —

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SKETCHES OF ANCIENT FONTS

AMERICAN CONSTRUCTIVE DETAILS.

This section of the cupola of the St. Louis Post-office forms one of several drawings which we propose to publish from among the numerous illustrations used by Mr. Gale for his paper read at the Civil and Mechanical Engineers' Society, part of which is printed elsewhere. The present one does not illustrate so much what is peculiar to American work as one or two others we shall give in other numbers, except as regards the iron and concrete flooring hung at the base of the roof construction; but it is a good piece of practical ironwork, and may be of value to students. Above this portion is a lofty and weighty lantern, constructed in the same manner with internal trusswork, and an outer (supposed) "architectural" skin. We are bound to say that the external treatment of the lantern (not shown in this drawing), in which iron plate-work is fashioned into the semblance of stone columns and architraves, is about as despicable a sham as ever was perpetrated; but that does not affect the question of construction.

This and other details we shall give are not drawn by Mr. Gale (a point on which he requests us to be explicit), but are from photographic reproductions of American working drawings, very liberally given over to him for the illustration of his subject.

WEST ENTRANCE AND DETAILS,
TINTERN ABBEY.

The elevation and mouldings of this beautiful piece of Geometric Gothic work were measured and drawn on the spot by Mr. J. Strong, as part of his series of drawings sent in competition for the Pugin Scholarship. The Gothic *furors* has now abated, and the time when work of this class was regarded as "the be-all and the end-all" of artistic architecture has passed away; but design so beautiful and refined as this remains "a joy for ever," amid all the changes of architectural fashion. The sections of details show some curious features: the fluting of the bases of the shafts, below the base-mouldings, in particular.

WAREHOUSE ARCHITECTURE.

The building in Broad-street, Bloomsbury, designed by Mr. J. Peacock, F.R.I.B.A., is a specimen of the solid and massive effect which may be produced by very simple but frank treatment of the main elements of constructive strength in such a building, with scarcely the slightest pretence at ornamental embellishment. The building consists of basement and five floors, all of which are on framed girders carried on cast stanchions, with rolled joists and concrete floors. The yard behind is inclosed and covered with a glass roof. The walls are of brick and Douling stone. The contractor was Mr. Chappell, and the cost of the whole 10,500l.

The stern simplicity of the structure might perhaps have been still more consistently carried out had the triglyphs over the main piers been omitted, or their place taken by some more original and characteristic detail. They seem a little out of place in a warehouse.

SKETCHES OF ANCIENT FONTS.

The font from Amiens at the left corner of the sketch is a curious example of the occasional eccentricities of French Gothic work. The proper or usual disposition of decoration seems capriciously inverted in it, the body being left square and almost plain, the supports covered with carved ornament. The treatment of the moulding at top and bottom of the cistern (rather than bowl), with its square projection at intervals, is Classic rather than Gothic. The picturesque example from Coucy le Château is of more usual type. The small illustrations of fonts from bas-reliefs at Amiens are of some interest. Two of them show something like Classic ornament under the bowl, and may have been rude representations or recollections of early Romanesque fonts that had existed in the district.

Fret-saw Arm for Lathe.—In giving, a fortnight ago (page 354, ante), a description of a mechanical improvement under this title, we inadvertently omitted the name of the makers, viz., the Britannia Co., of Colchester.

AMERICAN CONSTRUCTION.

UNDER this title a very full and interesting paper was read on Wednesday, the 12th inst., at the ordinary meeting of the Civil and Mechanical Engineers' Society, by Mr. A. J. Gale, who, it may be remembered, was the first holder of the Godwin Bursary, and devoted his opportunity to the study of American practical architecture. A good deal of the substance of the paper has appeared in our pages in a slightly different form; but it was illustrated with a number of diagrams, a few of which we shall be able to reproduce in this and one or two subsequent numbers; and we print here such portions of the paper as refer more especially to the illustrations we are able to find space for:—

As to Fireproof Construction.—Boston and Chicago are both, as might be expected after their experience of disastrous fires, fully awake to the importance of this question. New York is also well to the front. Mr. P. B. Wight, originally an architect, but now devoting himself to the management of a Fireproof Construction Company, gave me some interesting particulars. His motto is:—"No building can be fireproof unless all constructive ironwork is protected." But if ironwork be not used they protect the wood floors,—in fact, they prefer this method. The joists are carefully gauged as to distance apart, varying with the thickness of joists, so as to allow of deafening with brick laid on fillets like ordinary pugging. This is carefully bedded in fine concrete, and the whole covered with a tile, concrete, or boarded floor. Underneath is fitted a ceiling of porous terra-cotta or cement tile. Counter-sunk recesses receive a plate of iron, which is screwed into the joist, thus clipping the terra-cotta or tile to the joist; the adjoining tiles, all laid dry, are thus supported. The joints are then pointed in plasterer's stuff, and the plastering finished in the ordinary way. The additional weights, over and above ordinary construction, are: floors 12 lb. and ceilings 8 lb. per foot. Fifteen to eighteen per cent. is given as the extra cost above ordinary non-fireproof construction, and existing buildings can have this method adapted to them. Furring down on the joists for the ceiling tiles is sometimes used.

The stair aprons and strings are all similarly protected, the wooden treads alone being exposed, and all the decorative finish being in Keene's cement. If rolled iron girders be used to carry the joists, they are protected with porous terra-cotta or cement blocks, which are in two or more courses, one fixed to the bottom and one to the top flange. They are both pressed to the iron in gauged mortar, and iron holdfasts have been found unnecessary, as the blocks break first, when removal is tried. Columns again, if furnished 11 in. or more in diameter, are fireproofed at the same cost as cast-iron columns of the same diameter. Mr. Wight uses a webbed column of cast or wrought iron; to this, fireproof blocks of terra-cotta or cement are attached by slips (such as are described for ceilings) screwed to the core of the column; these are finished with plaster of Paris, lime of teil, or Keene's cement. The above method is the recommended one, but where circular columns already exist the blocks are grooved at the top and bottom edge to receive a metal tongue (as in the case of a tongued floor); the joints being bedded in mortar, the band is protected, and forms a strong joint. These columns, as described, have all their ironwork covered; the covering is solidly fixed, will stand blows of falling materials, &c., and the space occupied is small. The materials described are adaptable for covering the timberwork of sloping roofs with porous terra-cotta, for furrings inside brick or stone walls, in place of the wood furrings almost universally used in America; for hollow partitions, and for attachment to floors having iron girders and segmental arches already existing.

The system of *wire lathing*, not unknown, I believe, in France, is used with advantage in fireproof work, and I have a few illustrations showing the methods in which it has been used. It admits of easy adaptation to wood floors and beams, and from its flexibility is easy of adjustment in difficult places.

The underside of floors of brick arching over iron girders is, by a simple clip arrangement, covered with the wire lathing, and in this and other cases where material subject to damage by fire has to be used, it is covered up and made proof against damage.

The American inventive genius has been busy

in devising methods by which a fire which has once broken out can be limited in its area or entirely subdued. Among these are automatic iron doors which close by the fusing of a link in a chain, thereby releasing a self-shutting door. Also an automatic sprinkler, set in motion by a similar process, which plays upon the fire by a fire-hose with constant service.

In Iron Fronts for Buildings the advantages derived are less weight during construction and less weight afterwards, far less expense than a stone front, with the same amount of reveal surface, the amount of reveal surface well used being, after all, the chief means of gaining effect, apart from all elaborate detail, which cannot always be afforded. Shadows, moreover, are in America wonderfully sharp and decided, and the air is very clear, and a small expenditure used in gaining broad shadows without carving gives far better effect than much carving and little shadow. If ornament be used, it must be sharp and easily withdrawn from the mould. Iron fronts, again, are far more durable than stone, and much more watertight, so long as due care be exercised in construction. Particularly is attention necessary to the painting of every part, inside and out, seen and unseen; also of all bolt-holes and bolts. Large glass panes should be bedded with rubber tubes; beyond this there is no fear of contraction and expansion. Owing to the air-spaces which abound in such iron fronts, they are more equable in temperature and drier than stone fronts. The paint question, again, is an important one. Stone fronts, and those of brick also, retain dirt very much, and cannot be kept clean.

There were pointed out to me three buildings all adjoining; one iron front, painted when new, still fresh; a stone one which had become dirty, which was then painted, and had again become dirty; a third in brick, which though in its original state, was very dirty and shabby-looking. Carson's anti-corrosive paint is said to be the best for iron buildings, which, after this process, will last twenty years without re-painting, and have lasted fifty years without further trouble. This is, of course, in the clear American atmosphere. As to constructive details, there are two kinds: buildings with a skeleton or framework of iron and a thin skin fitted on, and those with a strong skin and no skeleton. The construction of the latter follows so closely the detail of the front that it may be dismissed without further description; but the former will require some explanation. It seems to be the better construction of the two, as the supporting portions are much more, if not quite, protected from the action of fire. In an example which I examined the fronts only were of iron,—the building consisting of four stories, with brick side, end, and party walls. The sashes were of wood, and all the joints of the ironwork itself, and of that with other materials, were carefully checked or lapped. The cornices were of galvanised iron, a material frequently used for the purpose, and almost a trade in itself. The foundation-wall of the front is brick, carried up in piers to receive the round cast-iron columns which are the vertical members of the skeleton. Across these, at the first-floor level, are rolled-iron riveted girders, and above are columns again. On the floors above the first, channel irons as lintels, laid with the back downwards, are placed, all bolted together. The columns are cased with brickwork, leaving a space between the outside of the brick and the ironwork shell; on the lintels or channel-irons, too, is 12-in. brickwork as high as the window-sills. The columns are continuous in height, and have brackets for the reception of the channel-iron, which in its turn carries the floors, which are anchored to the front. The metal is about three-eighths of an inch thick for the shell, which (surrounding the constructive skeleton) takes any form of detail required.

Iron fronts are said to be 40 per cent. cheaper than unpolished white marble, which may perhaps be regarded as equivalent to Portland stone in this country.

Though not an iron building in what may be called the ordinary sense, that is to say in a street front, the U. S. Barge Office at New York is well worthy of notice. It is a structure intended for landing passengers and examining baggage from ocean steamers, and consists of a stone building of several stories with a one-story iron building attached. The points of support, the nature of the roof plan, and the construction of the enclosing ironwork

of the sides can be seen from the large and small scale details.

The staircases are almost entirely framed in iron, with slate treads and detail of a rather intricate character. The means of affixing the plaster to the iron offers no difficulty, as either corrugated iron lathing or wire cloth can be easily attached to the structural iron supports. The building was in progress at the time of my visit.

At the St. Louis Post Office the central feature on the principal front is a dome, about 70 ft. by 80 ft., a parallelogram in plan, crowned with a cupola. The whole of the upper part is of cast iron upon wrought-iron skeleton framing. The dome itself is covered with slate, and has large wrought-iron ribs and bearing girders to distribute the weight.

The main roof is in deck form, with cement covering and cast-iron cappings to ridges and hips, &c. This roof terminates with a slated slope towards the streets. The methods of uniting the various materials are ingenious. The cement roof is carried on concrete, which rests on arched corrugated iron sheets.

At a large office building in New York called "The Mills Building,"* the roof is flat, carried upon rolled iron beams filled in with flat arching in hollow terra-cotta arch bricks; upon this a surface of asphaltic cement is laid, then four or five layers of roofing felt, each laid and finished in asphalt. Finally, the roof covering of bricks, either flat or, as in this case, edgewise, is laid in Portland cement. The patentee, Mr. T. New, of New York, recommends English or German cement, one part to two of sand. I may add that the bricks are, of course, the hardest and soundest to be procured, and the best judgment that can be obtained upon these roofs is their use in New York in almost all recent buildings of large size which have flat roofs, and they are numerous. The main staircases in this building are entirely of cast-iron, except the treads, which are of slate, in large slabs, about 14 in. or 14 in. thick. Iron takes the place of wood in the construction of newels, strings, risers, balustrades, &c. The slate landings are in two pieces resting (with the underside visible from below) upon the cast-iron bearers, of small deep girder section, which run from riser to wall. The internal partitions of the building are of hollow terra-cotta bricks, which are corrugated to receive the plastering. In the corridors the walls and ceilings are plastered, and the floors tiled; this allows of good washing; and to preserve the handsome hardwood dados (3 ft. high) from decay, they have a strip of marble 4 in. high as a plinth to the skirting. There are also holes at intervals to carry off the water during cleaning.

At the New Public Buildings in Philadelphia the floors are of rolled iron I-beams, and 4-in. hard brick segmental arches, with an extensive use of immense built girders. It has not been attempted, as far as I saw, to make the building generally fireproof, in the sense of protecting all constructional iron-work. The roofs are noteworthy; the trusses are of rolled iron I-beams connected by iron cleats; the rafters or trusses are crossed by I-irons laid back to the rafters and bolted on.

The slates are 18 by 10, all uniformly sawn, $\frac{3}{4}$ thick, and bolted to the I-irons with brass screw bolts and nuts of peculiar construction. The flashings and roof dressings are of tinned copper.

The Post-office and Court-house at Philadelphia are interesting as a typical example of Government buildings generally. The fine granite fronts, cut and fitted entire at the quarries, are put together on the building without the use of chisel, so accurate is the fitting. The granite for the lower story is from Dix Island, Maine; that for the upper stories from Richmond, Virginia. The staircase is an example of its peculiar type, with rolled iron carriages and cast-iron casings, and tile treads. The roof over the sorting-room, which has necessarily a large amount of glass, is constructed of cast-iron frames laid on bearers, and carefully lapped at the joints, and filled with glass bulls'-eyes bedded in putty, and grouted with a mixture of coal-tar and brimstone. The Philadelphia bricks used for the backing of the walls in this building, and also in the New City Buildings before described, have stood a crushing test of 500,000 lb. uninjured for five minutes. They

are the usual size of American bricks, 8 in. by 4 in. by 24 in. Cast iron is used very largely in the window and door finishings of this building. Other parts also of the construction are interesting, the idea, apparently being to give as little material as possible of an inflammable nature, to fall a prey to fire. The method of roofing with slate and copper is interesting, and the large four-sided dome as a central feature. The latter is upon iron framing, and covered with slate and copper.

Before leaving this part of the subject it may be as well to call attention to the varieties of treatment noticeable in the iron staircases. The treads are variously of cast iron roughened, cast iron filled with asphalt, tiles, or slate. Sometimes slate is used, merely screwed upon the ironwork, and not let in.

The roof of an apartment house which I visited is noticeable. It is, in the first place, very steep, and there are two floors in the roof, and an ample gable space above, also floored, the two former having hardly any floor-space covered by lean-to roof. At the three floor levels (that is at the top of the walls and at two points above), the rolled-iron joists of I section cross the span from roof-slope to roof-slope, and on these the floor rests. The roof is straight-sided, and not a mansard. The sides are constructed as follows:—The ends of the rolled iron joists of the floors are clasped by two channel-irons, which form the rafters, and are bolted together, with a thimble between. To these, on either side, is bolted a cleat or corbel, and on this rests, bolted to it, another I-iron, which forms a stiffener, or longitudinal brace, but can hardly be called a purlin, as it does not support rafters. The horizontal rafters, as one may call them, are I-iron, bolted flat downwards to the double channel-irons, and between these I-irons blocks of porous terra-cotta are dropped in and bedded in cement. On the outside of this, without further trouble, the slates are nailed, and the flats of the I-irons underneath are plastered up level with the porous terra-cotta, which is rebated, to allow it to come down rather more than flush with the under-side of the I-iron, and affords a key on either side. Thus the iron is carefully embedded in the porous terra-cotta, and preserved from possible contact of flame or excessive heat.

NEW REGULATIONS IN SWITZERLAND FOR TESTS OF CEMENT.

THE associations which represent the cement manufacturers and the architects of Switzerland have recently agreed to a series of regulations drawn up by Professor Tetmajer for the testing of hydraulic binding substances. That various points in them are of value would be inferred from the prominence which the *Thomindustrie Zeitung* of Berlin gives to these rules on the ground of their being worthy of consideration in such a revision of German regulations as would correspond with the technical progress attained by the cement industry. The passage referring to the time of setting is considered of special interest by the journal in question.

The following are the principal features of the regulations:—

1. *Definition.*—According to the uniform nomenclature, there belong to the category of hydraulic binding substances:—

Hydraulic Lime.—(a) As light hydraulic lime; (b) As heavy hydraulic lime.

Roman Cement.—(a) As quick-setting cement; (b) As half-slow setting cement.

Portland Cement.—(a) As natural Portland cement; (b) As artificial Portland cement. *Hydraulic Fluxes.*

2. *Packing and Weight.*—All hydraulic binding substances are to be in the form of powder, packed in sacks or casks, and are to be sold at a price per 100 kilos (220·46 lb.). The gross weight of a sack is to be 50 kilos (110·23 lb.), and that of a cask 200 kilos (440·92 lb.). For hydraulic lime and Roman cement the question of a definite weight for casks is at present left undecided. Sacks with cement are to be sealed with lead, and the seal is to bear the designation.

Remarks.—The proposed normal weights answer best as regards present usages, as 200 sacks = 50 casks = 10,000 kilos (nearly 10 tons), the latter forming a truck-load. All different forms of packing are understood to be given up after the 1st of January, 1884.

3. *Time of Setting.*—According to their uses, cements may be required to be quick or slow setting. Quick-setting cements are those in which hardening commences within ten minutes. If it commences after thirty minutes, the cement is slow-setting. If between the two, it is half-slow setting.

Remarks.—For defining the commencement of hardening and the time of setting of a hydraulic binding substance, a sufficient quantity of it without the addition of sand is stirred into a stiff paste, and a metal box (1·57 in. high, and 3·14 in. diameter), placed on a glass slab, is filled with it. The moment when a normal needle of .0015 square inch section, loaded with a weight of 0·66 lb., can no longer entirely penetrate the hardening substance, marks the commencement of hardening. Within the time from the filling of the box to the commencement of the hardening every cement is so far worked. The interval until the cake is so far stiffened that the normal needle no longer leaves any perceptible impression, is called the time of setting. For most technical purposes slow-setting cement is preferable on account of its easier and more certain working, as well as the higher grade of strength attained.

4. *Consistency of Volume.*—Hydraulic binding substances must in hardening, in the air as well as under water, not vary in their volume.

5. *Fineness of Grinding.*—All hydraulic mortar substances are to be ground as fine as possible, and must not leave behind more than 20 per cent. of coarse portions on a sieve with 900 meshes per square centimetre (0·155 square inch), the thickness of the wire being .0039 of an inch.

6. *Testing of Hydraulic Binding Substances.*—The binding power of hydraulic binding substances is to be ascertained by testing the strength by means of mixtures with sand. One part by weight to three of sand is to be considered a normal proportion for mixing. Normal sand is pure washed quartz sand, sifted in a sieve of 64 meshes per 0·155 square inch, for the removal of the coarsest portions; the finer portions being then removed by means of a sieve with 144 meshes per 0·155 square inch. The residue on the sieve is normal sand. In the preparation of the mortar the addition of water is in proportion to the weight of the dry substance. If a manufacturer does not recommend any other proportion for his product the addition of water is understood to be as follows:—

	Extension	Pressure
	test.	test.
	Per cent.	Per cent.
For normal Portland cement mortar	10	8
" Roman "	—	—
For quick-setting material	13	12
For slow-setting material	11	9
For hydraulic lime mortar	12	10

The percentage quoted indicates the proportion of the weight of the dry substance. As the duration of the working of the damped mortar has an influence upon the results of the trials for strength, the duration of working for quick-setting cements is fixed at one minute, and for slow and half-slow kinds at five minutes. All the specimens must be kept for the first twenty-four hours in the air, but in a position sheltered from draught and from the direct influence of the sun's rays; for the remainder of the time until immediately before the test they are to be kept under water.

7. *The Test of Extension.*—For ordinary samples of quality the twenty-eight days' test for normal water-hardening is decisive. In this the following minimum strengths of extension are fixed:—

	Minimum resistance to pressure.
Hydraulic lime	113·78 lb. per square inch.
Roman cement	142·23 " " "
Portland cement	213·34 " " "

8. *The Test of Pressure and the Classification of Hydraulic Binding Substances.*—The test of pressure after twenty-eight days' normal water-hardening is a definite and reliable standard, and the following classification of hydraulic binding substances is based on it:—

	Minimum resistance to pressure.
Portland cement	139·40 lb. per square inch.
Roman cement	137·80 " " "
Hydraulic lime	71·15 " " "

The above are the leading features of the code of regulations in question. Various details are also given bearing on the exact manner recommended for carrying out the various tests to which reference has been made.

* Plans of which were given in the *Builder* a year ago, viz., March 19, 1883, p. 318.

† For sections of which see *Builder*, March 19, 1883, p. 319.

TAUNTON CASTLE.

A CONSPICUOUS feature of this ancient castle, which was a fortress as early as the seventh century, has just been reinstated at the cost of Colonel Finney, of Somerset Erleigh. The turret attached to the south entrance gateway, next the inner courtyard, has been rebuilt. The original turret was probably erected about the time of Bishop Langton, whose arms, together with the date 1490, are over the south gateway, part of which he is known to have built. The blue lias used was of a very perishable kind, and was crumbling to pieces. The foundations were bad, and the bond very indifferent; the Ham Hill stone had decayed in many places, so that the turret was in a dangerous state. Some portion of the newel steps have been left *in situ*, and nearly all has been re-used, as well as some parts of the freestone work.

Evidences of the lost base-moulding and plinth were found, which have now been restored. The upper portion of the turret had been truncated, and was covered with a plain lead flat, without any string or parapet.

A battlemented parapet, partly of Ham Hill and partly of Pilsbury blue lias, has been added, so that the turret now has some of its former elevation, and can be well seen from the large open space to the south.

The work has been carried out by Mr. Henry Davis, of Taunton, under the direction of Mr. B. Edmund Forrey, F.S.A., the architect to the Somersetshire Archaeological Society, to which the castle now belongs.

THE PARIS ROOF-COVERERS.

THE Commission of the Forty-four still continues holding its inquiry into the causes, &c., of the depression of the French industries, and the amount of evidence collected is now assuming formidable proportions. Not only are workmen examined, but their employers also are cross-questioned; and, as in France, the employers were first to form trade unions, they can give evidence in a collective as well as in an individual sense. Thus the corporation of master-plumbers and zinc or lead roof-coverers consists of 720 employers for Paris and the Department of the Seine. Many of these firms do not employ more than one or two journeymen, and it is only the more important houses, 110 in number, who found it advantageous to create a Syndical Chamber, or *masters' trade union*. We might, in parenthesis, explain that it was the constitution of *masters' unions* in a great variety of trades that rendered the creation of workmen's unions possible. These latter were, and are still, illegal, but the Government could not logically interfere with the workmen while combinations among the masters were tolerated. Thus, the workmen's unions grew up side by side with the masters' unions, and now the Legislature is seeking to legalise both. According to the evidence given by the members of the employers' union, there are about 7,500 workmen engaged for zinc-roofing, &c. Of these the greater half are journeymen, as those who work in factories do not require assistants. From the 15th of February to the 31st of October the day's work is of nine hours' duration; while in winter, from the 1st of November to the 14th of February, it is not usual to work more than eight hours. Those who work on the roofs of houses are of course obliged to remain idle when the weather is exceptionally unfavourable, and it is calculated that, on an average, thirty days are lost in the year. The wages amount to 6s. per day for the journeymen and 4s. for their assistants, the same sum being paid both in summer and winter. When there is no work, or slack work, the wages are not reduced, but the employers are more severe in the selection of the men, and those who display but inferior skill are likely to lose their berths. In 1852 the wages given to the tilers was equal to 4s. 7d. per day, the plumbers 3s. 2d., and the assistants 3s. In 1862 these wages were raised to 4s. 10d., 4s. 5d., and 3s. 7d. respectively. After another decade, in 1872, the wages had reached the figures of 5s., 4s. 10d., and 3s. 10d. Finally, in 1882-83, the wages were 6s., 5s. 5d., and 4s., respectively.

The employers, after submitting the above figures, urged that though there evidently was some depression, this had been greatly exaggerated. According to the register kept by the Syndical Chamber of the sums deducted from wages to form a benefit fund, the falling off in

1883 was only equal to 8 per cent. when compared to the results attained in 1881, which was a very prosperous year in this trade. Nevertheless, it is estimated that the cessation of great public works will cause a reduction in the amount of wages paid during the present year variously estimated at from 15 to 20 per cent. This unfortunate state of affairs the witnesses attributed to the recent exaggerated speculations in building, which have absorbed in two years the work that might have been spread over five years. The financial societies are blamed for having at first encouraged this building fever, and then suddenly reversed their policy, and refused to advance funds. Finally, the Municipal Council is accused of paying the workmen it employs unreasonably high wages. This has led to the importation of manufactured articles from abroad which were formerly made in Paris, so that the workmen, instead of getting high wages, have in many instances found themselves without any wages whatever. The workmen in the plumbing and zinc roofing trades have never cared to create a sick benefit club of their own. The funds that exist for this purpose were organised some fifteen years ago by the employers, the amounts reserved being in proportion to the wages earned, and the benefits paid amounted to 754l. in 1881, and to scarcely 300l. in 1883. Some of the firms allow their workmen to participate in the net profits, but this is very exceptional. Such, according to the masters, is the position of this branch of the French building trade, and we shall soon have before us every phase of an industry which has nowhere been more actively pursued than in France.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the above Association was held in the Professional Hall on the 12th inst., the president, Mr. David MacGibbon, in the chair.

After some preliminary business had been disposed of, and after several gentlemen had been balloted for and admitted to the membership of the Association, the President called upon Mr. W. W. Macfarlane, who then read a paper entitled "Some Notes, Thoughts, and Sketches on the Decorative Arts,"—a "Pot-pourri," in which he endeavoured to show that good decorative work was not necessarily the outcome of lavish expenditure. Hints were given as to some simple and artistic modes of treating the interiors of town houses. The decorations and furnishings of an ideal bedroom were sketched, and other topics of importance in decorative matter discussed. Mr. Macfarlane thought that a practical demonstration on the use of colours, &c., would be of much more value than easy reading, and expressed his willingness to give this at some future time, provided a subject could be procured, and the necessary daylight. The paper was illustrated by numerous sketches.

LIVERPOOL ENGINEERING SOCIETY.

THE fifth meeting of the session was held on Wednesday evening, March 12th, at the Royal Institution, Colquitt-street. The president, Mr. R. R. Bevis, jun., in the chair, when a paper entitled "Compressed Air in connexion with Sewerage Works" was read by Mr. T. Longdin.

The author commenced his paper by pointing out that owing to the rapid increase of population in this country, it has become the duty of all authorities having the carrying out of the Public Health Acts to provide good and sufficient sewers to carry away the liquid residuals from their districts. In designing schemes of drainage many difficulties met the engineer to prevent his obtaining those gradients which are absolutely necessary to permit rapidity of movement of the sewage, but this can be overcome by the application of "Shone's Ejectors" which have for their motive power compressed air, which can be conveyed in iron mains to any part of the town or district, where ejectors receiving the sewage would be placed, working automatically, and accommodating themselves to the flow of the sewage. By this means difficulties caused by the physical outline of any town or district may be overcome, and gradients got which will permit of those velocities being obtained which are requisite to keep the sewers free from deposit.

MACCLESFIELD HOUSE.

MACCLESFIELD HOUSE, Gerrard-street, Soho, the residence of Gerard, Earl of Macclesfield, from 1680 to 1694, was put up for sale by auction, at the Mart, on the 6th inst. The house is an interesting specimen of the architecture of the age of Queen Anne, and has a handsome staircase, and a fine ceiling on the first floor. It has undergone various vicissitudes, and has been of late years used for business purposes. The notorious Lord Mohun, who killed Mountford, the actor, in a duel resulting from an attempt on the part of the nobleman to carry off Mrs. Bracegirdle, the actress, and who was himself killed in a duel by the Duke of Hamilton, expired in this house. It was also for some time occupied by Lord Lyttelton. The premises occupy an area of 3,480 square feet, and have a frontage of about 52 ft. on Gerrard-street.

In the auctioneer's advertisement the premises are described as presenting an admirable site for the erection of a first-class modern structure, and as much space is at present occupied by heavy chimney-breasts and thick walls, it is not improbable that the house may be rebuilt, and an interesting relic of London in the time of Queen Anne will disappear.

WESTMINSTER TRAINING SCHOOL AND HOME FOR NURSES.

THE Westminster Training School and Home for Nurses, which was opened on Wednesday by the Prince and Princess of Wales, was founded by Lady Augusta Stanley in 1874, and has occupied No. 8, Broad Sanctuary for some years, but as the public began to appreciate the benefits derived from the private nurses provided by the institution, and from their being so ably trained at Westminster Hospital, it was felt that a larger building was required, and after the death of Lady Augusta Stanley it was proposed that it would be a fitting memorial to her to erect a new building suitable for the requirements of the school and home, and after considerable time the present freehold site in Queen Anne's Gate, Westminster, was obtained, and the new building has been erected at a cost of 7,800l. (about).

The home is replete with every comfort for the nurses, and contains in the basement the usual kitchen offices, with ample store-rooms, box-room, and other conveniences; on the ground-floor a hall and staircase, with a stained-glass window, with portraits in it of Lady Augusta Stanley and the late Dean of Westminster, and the hall is laid with encaustic tiles; on the left of the doorway is the matron's room, overlooking the street, with telephonic communication with Westminster Hospital, and to the right the nurses' day-room (24 ft. by 16 ft.), also overlooking the street; the fireplace has a marble and carved oak mantelpiece, with the badge of the institution carved over it. On the side of the staircase is a waiting-room, and there is a good lavatory and cloak-room, with every convenience provided at the side of the passage for the nurses. The refectory for the nurses is at the back, and is 30 ft. by 16 ft., and adjacent to it is a serving-room, with lift from the kitchen, and also a serving staircase; in the passage also is a lift for coals and luggage, which goes from the basement and delivers at every floor to the top of the building. On the first floor is the matron's bedroom, which has a speaking-tube and bell from the front door for night applications for nurses. There are also on this floor a good linen-room and eight bedrooms for nurses, with bath-room and other accommodation. On the second-floor are ten bedrooms for nurses, with bath-room and other accommodation as below, and on the third-floor nine bedrooms, housemaid's closet, sinks, and other conveniences. At the back is a small detached building, for the reception of nurses who may return from infectious cases, with bath-room and other conveniences; there are also a disinfecting room and apparatus in the back yard.

The rooms are ventilated by Tobin's tubes and ceiling ventilators. The sanitary arrangements are of the best kind, the drinking-water being entirely separated from all other water. The drains are most carefully constructed on the most scientific principles with air inlet, ventilation, and automatic flushing tank.

The style adopted is "Queen Anne," in character with the houses in the neighbourhood, and the internal finishings are all carried out in

the same style. The woodwork is stained and varnished, and an air of old-fashioned comfort pervades the whole building. The builders have been Messrs. Adamson & Sons, and the architect is Mr. Stephen Salter, F.R.I.B.A.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—The gentlemen who are clamouring for a rival to the Institute do not show the sagacity of their countrymen,—a sagacity which has kept England free from many of the troubles that have afflicted other nations.

The Institute has now been in existence nearly fifty years, and, till comparatively lately, has had but a struggling existence. It is more or less known to the public and to foreign architects; it is beginning to exercise a beneficial influence on public opinion; to be consulted by the Government when it wants to know the opinions of the profession; and it is generally admitted to have raised the position of architects. Is the profession so powerful and independent that it needs no aid? Are its members so wealthy and so highly esteemed that they can always dispense with corporate assistance? My conclusions lie in the opposite direction. It seems to me that all who now stand aloof should enrol themselves in the ranks of the Institute, and thus form a powerful and organised body to act in case of need, and to prevent isolated resistance from being overcome, rather than lessen the little corporate power we have by schism.

If there are grievances they can be clearly stated and temperately argued, and I should think, if found to be real, must certainly be redressed; for every member who fulfils any duty does it purely for the benefit of his profession: he gets neither pleasure nor profit. Want of space, want of time, and want of funds check many improvements that are needed. Could a lowering of the subscription be afforded, it would doubtless greatly increase the number of the members.

We have no Parliamentary representative, so every possible architectural work is given by the Government to a military engineer or to the Board of Works. It would be interesting if we could know what the percentage on the outlay is at the Board of Works; if the real cost of design and supervision could be known; if we knew the present value of the land on which the offices are built; what the rent and taxes would come to, and what the expenses, salaries, and the like really are. I am told that in India these amount to 200 per cent. in the Public Works Department, i.e., that when all works are stopped only one rupee is saved out of three; yet when independent architects are employed by Government, the ordinary starvation pay of 5 per cent. is refused. Were the architects a powerful body these abuses would be stopped.

GEORGE ARCHISON.

150, Harley-street, W., March 19, 1884.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS, AND ITS CHARTER.

SIR,—The first step for the formation of the Royal Institute of British Architects was taken by the holding of a meeting at the Thatched House Tavern, on July 2nd, 1834, when twelve architects were present. Now, nearly fifty years after, that body numbers over 1,280 members of all kinds: thus it has increased numerically, and, it might be said, even to the same degree in power and influence. Yet, notwithstanding, many noted architects still hold aloof, as they and others have done in its previous history. In your number for Feb. 9 last, you referred to this in your "Notes," whilst mentioning the fact of the nomination of Mr. Butterfield, an outsider, to be the recipient of the Royal Gold Medal for this, the Jubilee Year. You referred to the "liberal-minded and dignified spirit" of the Institute, shown by this action, and rightly called on the outsiders "to reconsider their ways and join hands." Another important instance of this liberal-minded spirit was shown by the institution of the Pugin Travelling Studentship, for Pugin himself, unless I am mistaken, never joined the Institute. Besides, many other instances can be cited where liberality has been shown, and where great efforts have been made by the same body for the good of architecture and those con-

nected with it. It has moved in the questions of preserving ancient monuments, of improving building legislation, and of improving the streets and places of London; it has examined candidates and granted certificates under the Metropolitan Building Act, and has now fairly started an Architectural Examination without passing which no one is now permitted to become an Associate of the Institute, thus raising the dignity of the profession.

Inside the house the same improving tendency may be seen; the ordinary meetings for the reading of papers may no longer be disturbed and cut short by the starting of discussions on new patents, or even on professional business, or for the election of members, special meetings being now reserved for such business. Proceedings of the meetings are pretty fairly reported and sent round to all members after a few days; journals of the meetings and of the Council and committees meetings are also printed, and issued at intervals, besides the annual reports of the Council. Many of these were not even thought of a few years ago. The opinion of the Associates has been taken so far that it is now usual to place one or two of these on all or most of the business committees. The papers read are printed and illustrated in detail with the discussions, and issued twice a year to members if desired, the only apparent fault to be found with this being that too much is given at one time for some to digest, and they would prefer to have printed copies of each paper with the discussion in time to read on the evening of the meeting at their own firesides, instead of having to go to Conduit-street; many even are ready to wait; they know the papers will ultimately come to them.

Still, much yet remains to be done. The Council on laying "the Charter of Incorporation" before the members on Feb. 6th, 1837, stated in their address "the Charter is not the ultimate point of our hopes. It is but the first step in an enlarged sphere of action." Also in taking action on a resolution, calling for some improvements, passed at the annual general meeting, May 7th, 1849, the Council said in their report thereon, "they considered the resolution of the general meeting as most expedient and likely to lead to very useful results; for in the existence of all societies of a practical nature it is most expedient periodically to look back upon the past,—to consider what may have been effected, to what extent the original purpose of the institution may have been realised, and in what points it may have fallen short." If this were so then, is it not much more so now? In this the jubilee year, required improvements and alterations should be made, and fetters should be broken, or, if necessary, should be lightened.

The Charter is now forty-seven years old, and is a most honourable token of the standing of the Institute. It contains many excellent provisions, but, viewed according to the requirements of the present day, it omits some clauses which should not be omitted, and has some which should be. Were it not for the Charter I believe the alterations required would have been carried into effect before this, but as it stands this may not be done. A remedy is possible: let the Institute decide on the alterations required in this and the by-laws, memorialise Her Majesty for the alterations in the former, have both legally carried into effect, and pay the necessary sum required therefor. This may be somewhat considerable, but the money spent may be reconquered in various ways.

Some may not know how the Charter fails in these points; it is therefore necessary to show a few of its faults. When the Architects' Benevolent Society was instituted, the Council found that it could not be taken in hand by them, as the Charter did not provide for it; it has therefore been always separated from the Institute itself, and without doubt has suffered thereby, for the Council could only help it indirectly. The questions of the Architectural Examination and diploma were also without doubt delayed owing to this; the Charter does not provide for them. Certain disabilities were attached to the class of Associates, so that that class have never had the power of voting at the general meetings, and are thus placed at a disadvantage when compared with the same classes in the Institution of Civil Engineers, the Surveyors' Institution, and the Society of Chartered Accountants. It would be interesting to know whether Associates, when members of com-

mittees, have voted, and if so, whether their votes were legal.

Moreover, it appears doubtful whether by the Charter it is legal for the Institute to have a class of *honorary associates*, and for there to be associates who have been in practice more than seven years. It would further appear that by it any three members of Council could, at a subsequent meeting, upset a previous decision of the whole Council, and that by it the Fellows could decide on selling the whole property of the Institute without any hindrance from the other members. These things should not be, the by-laws have been altered, and, if the alteration has been found unadvisable, have been altered back again; a royal charter must, from its nature be more steadfast, but it should not be as "the law of the Medes and Persians, which altereth not."

One other fault of the Charter: the Royal Institute of Architects in Dublin formerly wished to be connected with the Royal Institute of British Architects; the Council of the latter body consulted the Charter and found they had no power.

In conclusion, my motto is "Improvement with the Times, but not Revolution."—I would even have said reform. Let the council look to these matters; let the outsiders come in, and let the Royal Institute of British Architects be not only the guiding body of the Profession throughout Britain, but even throughout the world.

HUGH MCLACHLAN.

SMOKE ABATEMENT.

SIR,—Many of your readers may be glad to know whether the smoke abatement movement is advancing satisfactorily. We had a year or two ago a smoke-abatement exhibition; meetings were held at the Mansion House and South Kensington, some hundreds of fireplaces were tested, as it was termed, and the whole terminated in a distribution of medals and the publication of a volume of reports. I pointed out in your pages as soon as the reports appeared, that they could not be relied upon, because they were vitiated by two blunders, which it was too late to retrieve. One blunder was testing all grates, stoves, and even, I believe, all kitchen fireplaces, with flues contracted to 6 in. in diameter, or, to use the technical term, "throttled." The second blunder was testing them for a few hours only, instead of relying upon the careful observation of months with proper chimneys. Can we wonder if the reports give remarkable inconsistencies, are bewildering to experienced men, and not to be relied upon by any, be they experienced or inexperienced? The only explanation or defence which has been offered will not bear investigation.

However, to leave this alone, are the essential principles of smoke abatement so extremely simple that they can be very readily understood? They certainly are. I leave alone all speculative matter, whether as regards the general use of anthracite, the economical and innocuous use of gas or gaseous fuel, as some call it, and still more ambitious schemes. I wish to confine myself to the simple means of burning our bituminous fuel without smoke. This is the most practical way of dealing with the subject at present, whatever the future may bring about.

It is open to daily observation that we have little or no visible smoke when a good fire is burning, and that there is an instant ascent of smoke whenever fresh fuel is supplied at the top. Now the principles of burning the fire without smoke are essentially only two. The first is that of supplying fresh fuel on the top so gradually, and in such small quantities, that the carbon of smoke is at once arrested and burned. This either involves a great deal of personal attention, which none would give, or the use of a hopper and assisting machinery, which would allow fine coal to descend on the fire at frequent intervals.

The second principle is, never to throw coal on the top of the fire, but either to burn a body of coal to last the day from the top downwards, or to introduce coal in small quantities below the fire. By both systems the carbon of smoke is arrested and burned in its passage through a superincumbent layer of burning fuel. A mode of accomplishing the same object is by the use of reversible grates, as they are called; a fire-pan or basket being charged with fuel at the top, and turned over so that the fresh fuel shall be below the burning fuel. Now it is desirable

the public should become very familiar with these four systems, founded on the two leading principles I have mentioned, viz.:-

1. Supplying a fire very gradually with small coal.
2. Burning a body of fuel to last the day from the top downwards.
3. Systems of underfeeding by shovels or otherwise.
4. Reversible grates.

It will now be seen how thoroughly simple the whole question is when divested of extraneous matter. The public want no medals or elaborate reports to guide them, but simply the exercise of sound discernment and common sense. My own opinion is that the first system is complicated and costly; that the third system is too troublesome for general use, as the coal must not only be broken small, but the requisite amount of care and force must be used to introduce the fresh fuel; the second and fourth systems appear to be the simplest, and both have been known for about seventy years. The second system has been persistently advocated in your pages for thirty years past, as used in a common fireplace, and, in my opinion, it is the system which is certain to supersede in time our present wasteful and smoky manner of burning coal. Will it be believed that by the misleading reports this system would appear to be smoke-producing instead of smoke-consuming, and yet it can be proved by overwhelming evidence that it only gives occasion for chimney-sweeping once in ten years, and that even then there is but little soot. What are we to trust,—a few hours' testing with throttled chimneys, or the experience of from twenty to thirty years with unthrottled chimneys?

It has been used for that period in a large number of instances, among others by Messrs. Burgoyne, corner of Stratford-place and Oxford-street, throughout two large houses, and by Sir William Gull and his predecessor Dr. Todd. The late Mr. Thomas Burgoyne told me that in fuel alone he had saved the cost of his grates over and over again. The well-known firm of Messrs. Benham & Sons have adopted the principle as offering in their opinion the most simple, practical, and efficient method of burning a smokeless fire. However, the course which should be pursued is a very simple one. We are shortly to have a "Health Exhibition," amply supported by funds. Let the systems I have described be fairly tested with unthrottled chimneys, and the public will begin to learn the benefit of using smokeless, sootless, and economical fires. FREDERICK EDWARDS.

ADDITIONAL LIABILITY FOR BUILDERS.

SIR,—As it is now the fashion to put as much responsibility as possible upon builders and contractors, I think that any new experience should be made known as widely as can be through the trade publications, and with this object I detail a recent example.

Some three months ago I contracted to 'build a suite of offices in the City. The specification provided a sum of money to be paid to a particular ironfounder, who was to provide and fix the cast and wrought ironwork, and whose account I was to pay on the certificate of the architect. During the progress of the work I considered that the tackle which the ironfounder was using in hoisting and fixing the columns was not sufficiently strong, so much so that I began to think who would be liable in case of accident. I referred to my contract, the conditions of which are those agreed between the Institute of Architects and the Builders' Society, but failed to discover any clause which expressly indemnified me against any liability for accidents resulting from the negligence of sub-contractors appointed or nominated by the architect or by the building owner.

I then submitted the question to my solicitors, and they advised me that as the work was included in my contract, and I was to pay the ironfounder, and the work was being done at the same time as my other work, upon premises which were under my control, I should probably be held liable, under the Employers' Liability Act, for any injury caused by the ironfounders' men either to my own men or to the sub-contractor's men.

Now this appears to me to be such a serious responsibility that I think all contractors should be made aware of the risk which they may incur by allowing workmen belonging to sub-

contractors to be on their works without having sufficient indemnity either in their original contract or from the sub-contractors.

The modern habit of introducing provisional sums to be paid to various specified tradesmen, and forming part of the contract-price, is becoming so general that in view of the new liabilities imposed upon contractors by the Employers' Liability Act, great care is necessary before signing the contract in order to ascertain that the liability to which I have referred, and which, I feel sure, neither the architect nor the owner wishes the builder to incur, is not thrown upon the contractor.

I will only add my acknowledgment of the fairness of the ironfounder in question, who gave me a letter of indemnity against the result of any accidents which might occur, for which his men or machinery might be responsible.

EDWARD CONDER.

DERBY ASYLUM COMPETITION.

SIR,—Referring to the letter of Mr. R. Stark Wilkinson in your issue of the 8th inst. [p. 355] I should like to make a few remarks.

The question of modern lunatic asylum planning is one that of late years has made considerable progress, and with which comparatively few members of the profession are practically acquainted.

Those who are acquainted with the work will naturally send in competitive designs, and the difficulty at once arises how to find a competent arbitrator. I maintain that a practical knowledge, not a theoretical one, is necessary. It is a question of plan and arrangement, not one of design and art, and a practical committee who, as visitors of the Asylum, are well acquainted with lunacy requirements, assisted by their medical officers, are likely to select a better plan than an ordinary professional referee.

To cite an instance. In the spring of 1882 a competition was invited for a lunatic asylum at Exeter with the usual double competition (an absolute waste of time and trouble), professional assessor, &c. The result of this appeared in your illustration of September 16th, 1882. Those who understood the subject saw at once that here was a plan which could not be approved by the Lunacy Commissioners unless all the new ideas of the last twenty years were to be ignored. It contained all the faults of the antiquated system, and it was difficult to see upon what ground it had been selected, except on the charitable hypothesis that both arbitrator and designer were about on a par as regards knowledge of the subject.

That this was so is proved by the following extract from the "Commissioners' Annual Report" of 1883:—"Plans for an Asylum for Exeter selected after open competition were submitted to us in the autumn. These plans were found to be unsuitable in many particulars, and have required much revision, so that up to the end of the year it had not been possible to submit them to the Secretary of State."

The arbitrator in the case mentioned was a well-known Professor of Architecture, and the selected architect your correspondent of the 8th.

I venture to think, sir, that I have made out a case not altogether in favour of the system adopted in the Exeter competition, and which your correspondent advocates. A.R.I.B.A.

CLOISTERS AT RATISBON.

SIR,—The illustration by Mr. Wm. A. Pite, in the *Builder* for March 15th, includes a very curious "chevron" ornament (called in the sketch a dog-tooth). It was used with very good effect in the chancel arch of the partly-destroyed Lady-chapel at the north side of Tewkesbury Abbey Church; it is also found in Selby Abbey Church, and in Normandy, at the Church of St. Contest, near Caen. It is one of those mouldings which are sufficiently rare to be of interest, as showing that there must have been some special connexion or means of communication between the buildings where it is used. The above-named buildings are of the best thirteenth-century type, and, although Mr. Pite puts the Ratisbon work down as of the fourteenth century, I venture to suggest that it is a century earlier, as the mouldings and ornament would indicate. The capitals remind me of work at Dore Abbey which is as early as 1187.

THOS. BLASHILL.

THE LONDON FEVER HOSPITAL.

SIR,—As an active member of the House Committee of the London Fever Hospital, I trust you will allow me to invite the attention of architects, builders, and all interested in hospital construction and management, to this institution.

In the past the hospital has done good service not only in the treatment of vast numbers of patients, but in increasing our knowledge of febrile diseases and the conditions best suited for promoting recovery from them. It has thus served to illustrate many features deserving attention in the construction and arrangement of hospitals for infectious fevers.

The main portions of the present buildings, as may be judged from their age (nearly forty years), are not by any means of the kind best adapted to the purpose, nor, indeed, are they so good, in many respects, as the more modern buildings that have been, and still are being, erected in different parts of the metropolis and its suburbs for the treatment of paupers suffering from infectious diseases. The Committee have lately made an effort to re-arrange the hospital-buildings so as to bring them up to the proper standard of modern hospital construction. A commencement has been made by the erection of a portion of a new block of isolation rooms, which you recently illustrated and described (*Builder*, Dec. 22nd, 1883, p. 820), but further progress is arrested through want of funds. The new rooms have proved of the utmost value,—so much so, indeed, that we wonder how we got on at all without them. They are, I believe, very nearly perfect for their purpose, but the usefulness of these new rooms demonstrates more clearly than ever how necessary it is to complete the entire block and to effect the other much-needed improvements.

Under these circumstances, and partly with the object of making the hospital an example of what such an institution ought to be, I am induced to appeal to my brother architects all over the country, to builders and all concerned in building operations, as well as to those interested in hospital construction, to assist us to complete the gradual reconstruction of the hospital. We want to provide for the most complete isolation of five or six diseases, to arrange for the subdivision of the patients into smaller groups than at present, to provide wards of improved arrangement, as regards warming and ventilation, to provide improved administrative offices adapted to the modern requirements of the institution, and to afford better accommodation for the nursing and domestic staff.

The lack of money for building purposes stands in the way of our carrying out these further improvements, and it is with the object of increasing our fund for this purpose that I now write. I shall be pleased to explain our objects more in detail to any one specially interested in the undertaking, and will only add that any sums that may be forwarded in response to this appeal will be gratefully acknowledged. P. GORDON SMITH.

Whitehall, S.W.

BELGIAN GRANITE.

SIR,—Being proprietors of Belgian granite quarries, we have much pleasure in giving your correspondents information with regard to this material.

It is not an artificial stone, but is quarried in Belgium and extensively used there, being well known all over Europe as one of the hardest and most durable of building stones.

We may mention that the Church of Wellin, Belgium, built of this stone during the thirteenth century, still shows the tool marks on it as if only just made. It is also used at the new Palais de Justice at Brussels, and the large and extensive new docks at Antwerp.

It has been introduced into this country for the first time at Bristol, in the erection of the Capital and Counties Bank, by the architect, Mr. Frederick Mew, of Doughty-street, Mecklenburg-square. This building has two frontages, in which the granite is used both fine-grained and polished.

AD. TACKON & TACKON BROS.

A CORRECTION.

SIR,—May I correct a little error in your last number? Two of the paintings which I have executed for the Marquis of Bute are recorded under "Stained Glass." They are panel pictures. N. H. J. WESTLAKE.

THE LATE MR. R. S. POPE.

SIR,—On the 10th of February, died at Bristol, within one month of his ninety-third birthday, Richard Shackleton Pope, for many years City Surveyor of that city. Early in life he was employed as surveyor to measure up the work done in erecting the Royal Mint, Tower-hill, at about his fifteenth year, his father being then clerk of the works to that building under the late Sir Robert Smirke. Mr. Pope was also connected with Sir R. Smirke's office when the late Mr. Vulliamy was there, and also with the late Professor Cockerell, and his father, the elder Mr. Cockerell. He was fond of telling tales of the old Mr. Holland, who owned the borough of Oakhampton, in Devon, for whom Mr. Pope's father was engaged in the erection of the Marble Gallery at Woburn Abbey, Beds. Mr. R. S. Pope afterwards came to Bristol to superintend the erection of the Philosophical Institution, for Mr. Robert Cockerell, having about the same time been offered by Mr. Cockerell the post of clerk of works to his church in Regent-street, London. After completion of the Philosophical Institution in Bristol, Mr. Pope became City Architect and City Surveyor, and most of the public buildings in Bristol were during that time erected by him. The Bridewell Police Stations, Guildhall, Catle Markets, some of the other markets, St. Mary's R.C. Church, the Royal Western Hotel and Horse Bazaar in College-place, Stuckey's Bank, Jones's shop in Wine-street, Acraman's tea-warehouses on the Quay, ironworks for the same firm in St. Philip's Marsh, ditto at their Anchor Works; also buildings and docks at Clift House; in all two hundred buildings of a good size in and about Bristol, besides a large proportion of the surveying buildings in Gloucestershire, Somersetshire, and Devonshire, around Bristol, were erected under his superintendence. He also erected the warehouses at Bridgewater and Chard for the Canal Company, Mr. Ward's mansion at Olveston, Mrs. Miles's picture-gallery, and many other buildings, and I believe never had a failure in his buildings, being to a very great extent his own clerk of the works; for this simple reason, he knew more than any clerk he could employ. Mr. Nelson and the founders of the Institute pressed him much to join, but he considered his time too valuable, continual arbitrations and business paid him better. His memory up to his death was astonishing, and his tales of older generations of architects would have filled up many of the pages of your paper; viz., the old architect who received his commission upon all the barrack-buildings during the war and only signed the accounts; the old clerk of works to Carlton House and the favourite of the Prince Regent, the old King George III. As a young man he joined the Surveyors' Club, and kept account of the port wine which they imported themselves, and to a few days from his death he never failed to take that much-abused wine. J. S. POPE.

CREMATION.

SIR,—In the *Builder* for Feb. 16th [p. 253, ante] you announce that "Dr. Cameron has secured the 30th of April for the second reading of his Bill regulating cremations."

It is to be hoped that clauses will be inserted in the Bill enforcing coroners' inquests and post-mortem examinations of all subjects about to be cremated. It has always been a popular idea (whether right or wrong, I do not know) that our bodies, after death, become the property of the Home Secretary for the time being, who can have them exhumed, or examined, or subject to such processes as he may think fit. What becomes of his "vested interests" after cremation? I care not what becomes of my body after death,—it may be served as Charles II. served those of Cromwell and Bradshaw, or "cremated," if my heirs think proper, only I ask to be allowed to depart in peace first. I should say, if they could be consulted, the late Dr. Palmer, of Rugeley, and Dr. Lamson, would prove advocates of cremation, but if we had received their "prescriptions," and then been cremated, those gentlemen might have been giving the world their opinions on the subject now.

W. F. PUTTER.

PIPES v. FAÇADES.

SIR,—The letter from Messrs. Banner Bros. & Co. on p. 390 may mislead. I do not claim to be the inventor now of "disease-germ filters," for the cutlet ventilating pipes of drains, sewers, &c., for many such, with charcoal, are illustrated in Mr. Baldwin-Latham's "Sanitary Engineering" (1878). On pp. 404 and 405 of this work are illustrated what I suppose Messrs. Banner Bros. & Co. "adopted" or "invented," but philanthropically refrained from patenting, in 1883.

As Messrs. Banner Bros. & Co. say they only "thought" lately of using asbestos or cotton, neither the Commissioners of Patents nor I have anything to do with prior "thoughts," but only with prior publication or use of plans or appliances. Filtering of the fresh air entering rooms, &c., has nothing to do with what is above referred to.

W. F. BUCHAN.

THE VICTOR EMANUEL MONUMENT COMPETITION.

SIR,—Foreign competitors may well be dissatisfied with particulars of the Victor Emanuel Monument Competition. Your correspondent last week [p. 390] complains of one broken rule, but I see much worse things than that. The three designs you have published equally and utterly ignore the imminent exigencies of the site. No one would suppose from these views that there were roads passing up on each side bounding and dominating the situation. The perspective views are simply impostures pretending to display the buildings, &c., as they might and would be seen, they being really from impossible points of view. If these designs were depicted from real points of sight, they would be so utterly altered that their own authors would not recognise them. It is said these designs are being modelled, but that will not better the matter, since people are not limited in viewing such things as to position.

The wholesale distribution of medals to native designs was an insult to foreign competitors, whose claims were sacrificed to feed the national vanity.

PHILIP E. MASEY.

MECHANICAL AIDS TO SCULPTURE.

SIR,—I regret to find that in my letter (p. 320, ante), with reference to Mr. Simonds's pointing machine, I have referred to the catalogue of the Exhibition of 1851, whereas it should have been that of 1862.

I have read with pleasure Mr. Simonds's letter (p. 355), and am glad to learn that he does not claim the principle of his machine as new, but rather its adaptation to a new purpose, as his previous letter had led me to a different conclusion.

It was by no means my intention to suggest that any machine could confer artistic excellence upon a copy, but simply to draw attention to the apparatus previously invented by Mr. Shaw.

In conclusion, I beg to thank Mr. Simonds for his courteous invitation to inspect his machine, which it will give me much pleasure to avail myself of.

HENRY D. CROZIER.

P.S.—The following errata occur in my letter (p. 320). "Lishamle-street" should be "Fishamble-street." In line 8 of the 2nd col. "point" should be "joint."

A WOULD-BE ACADEMY STUDENT'S DIFFICULTIES.

SIR,—I write to ask the advice of your readers on the subject of Probationary Drawings for admission to the Royal Academy Schools. Where can I obtain plan, elevation, and section of an existing building sufficiently good to copy? I have asked for such things at every print-seller's I know, walked in countless booksellers' shops, worried my friends nearly as much as myself, but am still without that plan, elevation, and section of an existing building. It is true there are many books which are illustrated with accurate and exquisite engravings of noble buildings, but they are in price far beyond my resources. In despair, I made duplicates of some drawings I had prepared in the office where my daily lot is cast, sent them to Burlington House, and in due time had the honour to learn that they were rejected. I went to recover them, and had an interview with the Instructor, who informed me that the architectural sculpture and the perspective (the other specimens of the applicant's ability) would "do," but that the drawings of the existing building were executed in a manner not in accordance with the taste of the Council, and that the design was, artistically considered, hopelessly horrible. In answer to his first objection, I pointed out that all the printed rules were scrupulously complied with; and with regard to the second, though concurring in his depreciation of the design,—all artful pupils disown their masters' works,—I ventured to think that an inferior building could be as well delineated as a good one, asking him to bear in mind that the rules precluded applicants from being responsible for anything but the draughtsmanship. Well, I was snubbed, and retired with my unwelcome burden, which I savagely destroyed. After more research, I discovered a publication issued some thirty years ago,—the cheapest, I think, in Mr. Batford's collection,—from which I copied a plan, elevation, and section of an existing building, which was unfortunately in the Italian style, and finished them in the manner kindly recommended by the Instructor. Again rejected, doubtless owing to their demerit; but that the fact of their being combinations of a taste long since decayed contributed to their failure and my great discomfort.

The question propounded above at first sight appears to present no particular difficulty, but under certain circumstances it does. One must be the possessor of drawings which to copy will occupy his leisure time for weeks, and those that are small, or not engraved in a clear and accurate way, are valueless. What is wanted, I am convinced, are designs by some eminent hand, of a building in the "modern" style, and the difficulty to one who has not the entrée of an office ruled by one of those eminent hands is where to get them.

IMPROBATUS.

CHURCH BUILDING NEWS.

Monkwood.—The Bishop of Llandaff opened Monkwood Church, Monmouthshire, on the 11th inst. It is built with hammer-dressed local stone, relieved by Westwood ground dressings, and the roofs are covered with silver-grey slates. The style is that of the early part of the fourteenth century, accommodation for 130 worshippers being provided, at a cost of about 1,000*l*. The fabric consists of a nave, with double bell-turret at the west end and an open-timbered porch on the south side; a chancel, screened off from the nave by a dwarf wall, and having a lofty arch, with sub-arch, supported on red Mansfield responds; and vestry, leading from the chancel, on the north side. The chancel roof is boarded in an arched form, and the nave is open to the ridge, plastered between the rafters, and having arched principals supported on carved stone corbels. The cathedral rolled glazing was supplied by Mr. Ben. Gay, of Bristol. The wrought-iron altar standards, door hinges, and candle corona in the chancel came from Brawn's Birmingham Art Metal Works; and the duplex oil corona in the nave from Barratt, of Birmingham; the hot-air heating apparatus being by Porritt, of Bolton. The old font has been cleaned, raised, and re-fixed, and a recessed credence provided in the north wall of the chancel. The carving, by Mr. J. T. Davies, of Brynmawr, is principally in imitation of natural flowers, foliage, and fruit. The porch, nave passages, and chancel are all laid with Webb's Worcester encaustic tiles, glazed ones being introduced in the east end. The architect was Mr. E. H. Lingen-Barker, of Hereford; and the builder Mr. E. Giles, of Little Mill.

St. Ives.—The parish church of St. Ives, at St. Ives, in Cornwall, has just been restored, from the designs of Mr. R. Medley Fulford, architect, Exeter. It is an ancient edifice, dating from the fourteenth and fifteenth centuries, and built in great part of grey granite. The roofs have been overhauled and made good, and the windows renovated, and the whole edifice rebathed with oak seats. The interesting fourteenth-century sedilia has been well cared for by Mr. Harry Hems, of Exeter, who has also made, from the architect's design, a handsome lectern of carved oak. The passages are laid with encaustic tiles, from Messrs. Maw & Co.'s factory at Ironbridge, and Mr. Porritt's system of warming is used. The expenditure has been over 1,000*l*. Mr. Blowey, of Plymouth, was the contractor.

Combs St. Mary (Suffolk).—The parish church here is about to be entirely restored under the superintendence of Mr. Herbert J. Green, architect, Norwich. The fabric, as it now exists, is in a dangerous condition. The new rector, the Hon. and Rev. A. C. Baillie-Hamilton, is endeavouring to obtain the necessary funds to carry out the work. The church is one of the most interesting in the county. The windows in the south aisle still retain a large portion of the old fourteenth-century stained glass.

Barney St. Mary (Norfolk).—The whole fabric of this beautiful little parish church is in a most dilapidated state. The roof over the nave is one of the best examples of woodwork in East Anglia, and the church generally has many features of interest. An effort is now being made to raise funds for the entire restoration, under the superintendence of Mr. Herbert J. Green, architect, Norwich.

Sheffield.—The large Church of St. George, built in the beginning of this century, has had its eastern end beautified, and new altar-rails of polished brass added, under the supervision of Mr. Webster, architect, of that town. A large pulpit (10 ft. 6 in. high), a double prayer-desk, and Litany desk, the whole in carved oak, and of the Perpendicular type, have been added. These are the work of Mr. Harry Hems, of Exeter.

Buckfastleigh.—Tourists in this sunny spot in South Devon will remember the ruins of Buckfast Abbey. The Benedictine Monks have recently re-acquired their old home, and are now restoring it. The Abbot's Tower, a fifteenth-century structure,—has just been taken in hand. The masonry is being made good, new windows put into the gable holes in the sturdy walls, a new roof and parapet placed over the whole, and the interior made seemly with oaken floors and fittings. Mr. Harry Hems, of Exeter, is doing the work, under the immediate direction of Mr. F. A. Walters, A.R.I.B.A., architect, of Great Queen-street, Westminster.

Ashton, Breage (Cornwall).—A new mission church, erected by the Rev. E. M. Fridmore, vicar of Breage, to the memory of his wife, at Ashton, has been formally dedicated by the Bishop of Truro. The church is in the Early English style, and has been designed by Mr. Piers St. Aubyn. During week-days a portion of the building is to be used as a school-room. The roof is of pitch-pine, and the windows are of cathedral glass, by Messrs. Fouracre & Watson, of Plymouth. The seats are of pitch-pine. The contractors were Messrs. W. Carah & W. Edwards, of Crowan.

DISSENTING CHURCH-BUILDING NEWS

Ramsey (Isle of Man).—A new church to seat 350 persons is now being erected by the Presbyterians of Ramsey. The site is in Waterloo-road, near the entrance to the new pier, and opposite to the Pavilion. Messrs. T. D. Barry & Son, of Liverpool, who have carried out other works on the island, are the architects. The building will be of stone, pointed with cement, with cement dressings. A school-room, capable of holding 350 scholars, will be placed in the basement. Messrs. Boyde Bros. are the builders.

Plymouth.—The Presbyterian church in Wyndham-street, Plymouth, which was burned down fifteen months ago, was re-opened on Sunday last, after restoration. The new building is described as being a great improvement on the old one, the architect having (we are told by the *Western Morning News*) conceived the "happy thought" of adding an exterior portico and pediment to the building, of which he was the original architect. Internally, the side-galleries have been removed, and the gallery at the end of the chapel has been lengthened to make up for it. Ventilation is provided for by three or four grated apertures in the roof and through the casements of the windows, and the chapel is to be warmed by a hot-air apparatus, by Haden, of Trowbridge. The church will now seat about 800 persons. It will be cushioned throughout in the basement. The gallery is set apart for the military in the morning,—the minister being chaplain to the Presbyterian troops in garrison,—and in the evening it will be open for the accommodation of the general public. Beneath the chapel, as before, there is a spacious schoolroom. The architect for the restoration was the architect of the original building, Mr. J. L. Hodge, of Courtenay-street; the contractors were Messrs. Palk & Partridge; Mr. Rowe supplied the gasfittings; Messrs. Randle & Prowse were the painters; and Messrs. Harding & Sons were the upholsterers.

STAINED GLASS.

Donington (Lincolnshire).—This old and recently restored church has just been further beautified by the addition of four memorial windows. The east and south-east windows are in memory of the two sons of the late Dr. Frere, and have been erected in obedience to the bequest of Mrs. Frere, whose death occurred recently. The subject chosen for the east window is the Ascension; the subject for the south-east window are water scenes both of the Old and New Testament, appropriately chosen as both the sons were in the Navy and died on board ship, one at Bermuda and the other at Bombay. The artists are Messrs. Hardman & Co., who have carried out the work under the executors of the will, Dr. Jollye and Mr. R. Bothamley, of Donington. The window placed in the south side of the chancel has been erected by the present vicar, Rev. J. D. Grenside, in memory of his first wife. It represents the Bethany family in the scenes of their history, as related by the Evangelists. The west window is in memory of Mr. Enoch Millson, for many years a resident in Donington. The subject is the Last Judgment. Near the window is a brass tablet of elaborate design, with the name, age, and death of Mr. Millson, who will be remembered not only by the window, but by his munificent charity in the district.

Act., (Middlesex).—The clearstory windows on the south side of All Saints' Church have been filled with stained glass. The illustrations are confined to figures of saints specially commemorated in the Church services. Each window (there are five on each side) is of two lights, and the figures with their emblems are richly coloured, and, for the better transmission

of light, stand forth from a plain white quarry background. Messrs. Powell Bros., of Leeds, executed the work.

Sharrow.—Two stained-glass windows, the gift of his former parishioners, have been placed in the Church of St. Andrew, Sharrow, in memory of the late Rev. Edmund Boteler-Chalmers, D.D., the first vicar (1869-1879), but who was at the time of his death Vicar of Rammoor. One window is a side chancel window of two lights, embodying one subject, viz., Christ's Charge to St. Peter. The other window is a rose-window over against the font. The artists are Messrs. Powell Bros., of Leeds.

Harrogate.—Trinity Chapel (Wesleyan) has just been presented by Miss Kay, of Harrogate, with stained-glass illustrations for the two windows which, one on each side, flank the organ in rear of the pulpit. These windows are of richly-floriated ornamentation in the Decorated style of the building, environing various blazoned texts. They are by Messrs. Powell Bros., of Leeds.

Selby (Yorkshire).—Selby Abbey Church has recently had a window on the north side of the choir filled with stained glass. The window consists of four main lights and several openings in the tracery, which are filled with old painted glass, which has been carefully restored. The large openings have each a foliated canopy, partly old glass within a border of small figures of the twelve Apostles and twelve of the principal martyrs, with a large figure beneath on a ruby ground, diapered with the initials of the figure, and a subject beneath under a canopy relating to the history of Benedict, the first abbot of the abbey. The window was the gift of Mr. W. Liversidge, J.P.

Exeter.—A committee of ladies, headed by Mrs. Temple and Mrs. Morgan Cowie, is being formed for the purpose of raising a sum of about 500l., to fill the handsome window over the clock in the northern transept of Exeter Cathedral with stained-glass representations of some of the women of Holy Scripture. The Scriptural characters selected for representation in the window are understood to comprise the Blessed Virgin Mary, the Queen of Sheba, Miriam, the Jewish captive maid in the service of Naaman's wife, Lydia, Dorcas, and Eunice.

VARIORUM.

WE have received the first number of "The Encyclopædic Dictionary" (Cassell & Co.), which will comprise, when it is completed, an enormous mass of information, we hope all reliable, but as the first part, of over sixty pages, only gets us as far as "Ad," we fear the date at which the completion may be looked for is somewhere in the Greek Kalends.

From the same firm we receive Part 86 of the "Practical Dictionary of Mechanics," a useful publication, admirably illustrated.—"The Art of Soap-making" is explained in a volume of over 200 pages, with explanatory cuts and a very full index, by Mr. Alexander Watt; the book (Crosby Lockwood & Co.) may prove useful to architects who have to erect any buildings in connexion with the soap manufacture, and others may not be indisposed to learn a little about a common material which is so indispensable to us, but about which most of us know so little.—"Turning for Amateurs" (Upcott Gill), by Mr. Jas. Lukin, speaks for itself; it gives the amateur copious descriptions of tools and methods of working.—"Book-keeping no Mystery" (Crosby Lockwood & Co.), by "An Experienced Bookkeeper," may be of use to some, though we are rather disposed to think that a bookkeeper is like a poet, in one respect, at least,—*nascitur non fit*, and that success in keeping accounts with neatness and accuracy is, in part, a matter of individual character; some will never be trustworthy in it, others are so by nature in a way of their own, even without having learned the orthodox way, which would, no doubt, have assisted them.—"The Railway Companies' Directory, 1884," gives statistics as to directors and principal officers, state of accounts and balances, and other information of value to those who regard railways from the investment point of view, of all the lines in the kingdom. It is remarkable how the passenger traffic returns emphasise the importance of the third-class traffic,—a point on which we have more than once touched when urging more chivalrous and liberal policy on the part of railway companies and railway officials towards their poorer pas-

sengers. In the case of the Midland, which runs no second-class, it is not so surprising, perhaps, to find first-class tickets (for the half-year ending the 30th of June, 1883), representing 129,619l., while third-class represent 672,119l.; but the difference is even more marked on the London and North-Western, which gives very good second-class accommodation, and we find first-class tickets (for the same period as above) standing for 256,482l.; second-class, 173,909l.; and third-class, 998,782l. This admirably-managed company has now made its third-class carriages very comfortable, and some people might argue that its returns would have been increased by making it more desirable to avoid third-class for second; but we believe their policy is the right one, even in a commercial sense, and that the only difference in making uncomfortable third-class carriages is that the company carries a discontented instead of a contented *clientèle*, and reaps the curses instead of the thanks of its passengers, as we see in the case of at least one famous (or infamous) line. The "Railway Companies' Directory" is obtainable through Messrs. W. H. Smith & Son.—"The Sanitary Record," published monthly (Smith, Elder, & Co.) keeps a good running commentary on the sanitary topics of the day, besides giving special information and printing special papers on sanitary subjects.—"The Garden Oracle" (Gardeners' Magazine office) combines an almanack with its oracles, and is also a floricultural year-book, by Mr. Shirley Hibberd, editor of the *Gardeners' Magazine*.—"The Medical Annual and Practitioners' Index" (Kimpton) is, as its name implies, chiefly of value to "the faculty."—The Epidemiological Society of London send us their "Transactions for the session 1882-3 (David Bogue), also, of course, mostly medical, but including an article by Mr. Norman Chevers, "A Glance at the Sanitary defects of London and its Environs," which may be of interest to some of our readers.

—"Whitaker's Almanack" is as valuable as ever in its varied information.—"The History of a Lump of Iron," by Mr. Alexander Watt (A. Johnston) is a brief popular treatise on the subject, giving a good deal of general information in an agreeable form.—"From the Science and Art Department we receive a third and enlarged edition of "A List of Buildings in Great Britain and Ireland having Mural and other Painted Decorations," with a historical introduction in regard to mural decoration by Mr. C. E. Keyser, in which a good deal of information, in a rather dry form, is to be obtained. The book is sold at the South Kensington Museum.—"Picturesque America" (Cassell & Co.) has reached Part 34 out of its promised forty-eight parts. It is a fair specimen of a cheap popular work of the kind, but the style of the illustrations shows rather painfully one of the inevitable results of the attempt to produce works of this kind at prices "for the million," when we recall Bartlett's superb steel engravings in similar works ("American Scenery," "Canadian Scenery," &c.) in an earlier stage of the century.—"The Skeleton at the Plough" is the rather sensational title of a small book by Mr. George Mitchell, "One from the Plough," as he delights to style himself, whose trenchant letters on the wrongs of the agricultural labourer will be remembered in our columns some years ago. We do not admire the tone of all Mr. Mitchell's remarks, and we have no doubt at all that he is often very one-sided; but he has given important aid in calling attention to, and leading to the mitigation of, evils of a kind which are seldom redressed unless people who are rather one-sided speak vigorously about them, and drive the nail home with a will. Some parts of the book are a little out of date now, we should hope, but it is a plain and vigorous narrative of very sad and painful facts. The book is to be had from the *Beehive* office, and from Roberts & Co., Red Lion-court.—"The Bibliographer" (Elliot Stock) is a journal of a type which would have delighted Mr. Jonathan Oldbuck; printed on good paper in a rather old-fashioned style, it deals with subjects connected with the world of book-love in an apparently competent and interesting manner.—"The City of London Directory" (W. H. & L. Collingridge, City Press office) is an admirably got-up publication of the kind, very full in its information, substantial and effective in its binding.

Among art publications we have received vol. iii. of the *Journal of Decorative Art*, the combined numbers for the past year (Henry Vickers); the illustrations are well executed

but do not appear to us to be as good in idea as in execution, or to evince any settled conviction as to what decorative art really should be.—*L'Art* keeps up its interest and the quality of its illustrations, largely consisting of fac-similes of artists' original drawings and sketches; and the *Portfolio*, under the able editorship of Mr. Hamerton, shows no signs of falling off from its standard as a remarkably refined and high-class artistic periodical.—Mr. Edward Stanford, of 55, Charing-Cross, has sent us his annual "Map of Metropolitan Railway, Tramway, and Miscellaneous Improvement Schemes," which will be found very useful for reference now that many of the schemes marked on the map are engaging the attention of Parliament.—The *Furniture Gazette* (Wyman & Sons) has, since the commencement of the present year, appeared in a new and attractive form, the printing and general get-up of the paper being very well done. Week by week this journal gives a large amount of practical and business information, and it is very fully illustrated.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

March 7.—4,500, H. Wyatt, Redhill, Sash-fastener.—4,507, W. Johnson, Dunfermline, Self-closing Hinge.—4,533, J. King, Reading, Chimney Cows and Ventilators.

March 8.—4,569, S. Slater, Oldham, Weather Strips for Doors and Windows.—4,570, S. Slater, Oldham, Door-sill Brasses, &c.—4,572, E. McTaggart, Crossmyle, Rollers for Blinds.—4,603, W. D. Scott-Moncrieff, London, Water-closet Apparatus.—4,604, E. Newman, Birmingham, Window-fasteners.—4,607, S. Guivrey, Epsom, Sash-frame Pulley.

March 10.—4,635, W. J. E. Henley and E. J. E. Henley, London, Concrete Building.—4,646, C. J. Poole, Forest Gate, Opening and Closing Swing Doors.—4,649, G. Paine, Worthing, Opening and Closing Swing Sashes, Shutters, and Doors.—4,653, H. Thompson, London, Stoves and Grates.

March 11.—4,673, A. Swan, Greenock, Chimney-top.—4,697, T. Arnold, London, Ventilation of Buildings.—4,699, H. B. Dow, London, Cowl.—4,709, F. A. Nibbs, London, Roofing Tiles.—4,725, W. R. Lake, London, Flushing, Cleansing, and Purifying Sewers. Com. by P. Burke, Salt Lake City, U.S.A.

March 12.—4,741, F. A. Weston, Caerleon Village, Blind-roller.—4,749, F. Taylor, Chippingham, Cord Holdfasts for Blinds, &c.—4,763, G. Macfarlane, London, Trapping and Ventilating Sink-wastes, Water-closets, &c.—4,763, E. Sherratt, Swansea, Metallic Roofings, &c.

March 13.—4,810, W. H. Hindle, Blackburn, Water-closets.—4,813, R. Nunn, Glasgow, Downcast Ventilator.

SPECIFICATIONS ACCEPTED.†

March 14.—3,006, G. Deacon, Northampton, Glazing of Roofs.—3,094, H. D. Lake, London, Opening and Closing Doors, &c. Com. by L. C. Norton, Boston, U.S.A.

NOTICES TO PROCEED

Have been given on the Dates first named.

March 11.—5,270, T. Banchoff, Alloa, Ventilator (Nov. 7, '83).

March 14.—5,320, J. U. Mocratti, London, Fire-places, Stoves, &c. (Nov. 10, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending March 15, 1884.

3,399, F. Newman, Ryde, Fastenings for Doors (July 10, '83, price 8d.).

To allow the door to open outwards when pressed, the bolts at the top and bottom that secure the same are connected to a vertical tubular rod by quick-working screw-brads. An arm projects out at an angle from the rod, which on being pressed turns the rod and the bolts are withdrawn. (Several modifications are shown.)

3,510, W. Ayres, London, Sash-weights (July 13, '83, 2d.).

The weights are cast with the holes for the lines in them. (Pro. Pro.)

3,634, B. J. B. Mills, London, Hygienic Joint for Doors, Windows, &c. Com. by J. Couturier, Lyons (July 24, '83, 6d.).

This is formed of elastic bands pressed by springs against the surfaces to be closed, through which the air slowly filters.

3,647, A. Mechan, Glasgow, Ventilating Cows, &c. (July 25, '83, 6d.).

These are made in two halves, each half being stamped out of sheet metal and then joined together.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the date named.

3,648, F. W. E. Braid, London, Fire-resisting Doors or Shutters (July 25, '83, 4d.).

Inside the doors, &c. (which may be of wood or metal), is a quantity of cotton or woollen slag inclosed in wire-work, and between the slag and the casing of the door is a layer of asbestos cloth.

MEETINGS.

SATURDAY, MARCH 22.

Architectural Association.—Visit to the Scottish National Church, Pont-street, Belgavia. 3 p.m.
Royal Institution.—Captain Abney, R.E., F.R.S., on "Photographic Action considered as the Work of Radiation." (IV.) 3 p.m. 12 to 10.

MONDAY, MARCH 24.

Building Exhibition, Agricultural Hall. 12 to 10.
Royal Institute of British Architects.—Special General Meeting for Alteration of By-Laws. 8 p.m.
Surveyors' Institution.—Mr. W. Fowler on "The Ancient Terms applicable to the Measurement of Land." 8 p.m.
Society of Arts.—Professor W. Chandler Roberts, F.R.S., on "The Alloys used for Coinage." (Cantor Lecture.) 8 p.m.

TUESDAY, MARCH 25.

Building Exhibition, Agricultural Hall. 10 to 10.
Builders' Clerks' Benevolent Institution.—Annual Dinner, Ebbw Vale Restaurant. 8.30 p.m.
Institution of Civil Engineers.—Discussion on Mr. Longridge's paper on "Wire-Gun Construction." 8 p.m.
Anthropological Institute.—(1) The Earl of Wharncliffe on "A Flint Implement from Yorkshire." (2) Mr. F. G. Hilton Price, F.S.A., on "Some Ancient Egyptian Bronze Implements." (3) Dr. J. G. Garson on "The Frankfort Craniometrical Code." 8 p.m.

WEDNESDAY, MARCH 26.

Building Exhibition, Agricultural Hall. 10 to 10.
Society of Arts.—Dr. B. W. Richardson, F.R.S., on "Vital Steps in Sanitary Progress." (Sir Robert Hawkins, C.B., in the chair.) 8 p.m.
Civil and Mechanical Engineers' Society.—Mr. Thomas Cole, A.M. Inst. C.E., on "Steam Trams." 7 p.m.
The Hospitals Association.—Mr. W. J. Nixon on "Difficulties associated with the Administration of the Out-Patient Department." 8 p.m.
Royal Society of Literature.—Mr. C. H. E. Carmichael on "Crutius and the Literary History of the Law of Nations." 8 p.m.

THURSDAY, MARCH 27.

Building Exhibition, Agricultural Hall. 10 to 10.
Society of Antiquaries.—Mr. W. St. John Hope, F.S.A., "On the Architectural History of Rochester Cathedral and especially on the Norman Period of that History." 8.30 p.m.
Society for the Encouragement of the Fine Arts.—Mr. J. Forbes Robertson on "International Exhibitions, with special reference to the recent Exhibition at Munich." 8 p.m.
Society of Engineers.—Mr. J. W. Wilson, jun., on "Bridge Construction." 7.30 p.m.
Parkes Museum of Hygiene (74, Margaret-street).—Dr. Watson Cheyne on "Bacteria, particularly the Organisms occurring in Disease." 8 p.m.
Society of Telegraph Engineers and Electricians.—(1) Prof. Geo. Forbes "On the Properties which ought to subsist between the Size of Conductor and the Strength of the Currents." (2) Mr. Thomas H. Blakesley, M.A., "On the Relation which should subsist between a Current of Electricity and the Conductor employed to convey it." 8 p.m.
Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigators." (V.) 3 p.m.

FRIDAY, MARCH 28.

Building Exhibition, Agricultural Hall. 10 to 10.
Architectural Association.—Mr. W. R. L. Rich on "Water Supply to Country Houses and Isolated Public Buildings." 7.30 p.m.
Royal Institution.—Professor Osborne Reynolds, F.R.S., on "The Two Manners of Motion of Water, shown by Experiments." 9 p.m.
Society of Arts (Indian Section).—Mr. Griffin W. Vyse on "Trade Routes in Afghanistan." 8 p.m.

SATURDAY, MARCH 29.

Building Exhibition, Agricultural Hall. 10 to 10.

Miscellaneous.

A Sailors' Institute was opened at Goole, East Yorks, on the 18th inst., by Mr. W. Aldam, J.P., Chairman of the Aire and Calder Navigation. The design is by Mr. W. Alfred Gelden, architect, Hull, which was chosen in a limited competition. The style of architecture is Tudor. The building is faced with red bricks, with Ancaster stone dressings. The total cost of the building is 1,300l. The contract has been carried out by Messrs. Jackson Bros., of Goole.

The Colchester Museum.—It having been thought desirable that a complete catalogue should be made of the Roman and Mediaeval antiquities in the Colchester Museum, Mr. J. E. Price, whose name has been prominently before our readers in connexion with the Roman discoveries at Brading, was requested to undertake the task, which he has done in a very thorough and painstaking manner. His catalogue will probably add considerably to the interest and usefulness of the museum.

Proposed Monument to Coligny.—A fund is being raised for the erection of a monument in Paris to Admiral de Coligny.

Aboriginal Dwellings in Arizona.

An interesting discovery has been made by Mr. James Stevenson, of the United States Geological Survey in Arizona, where explorations have been carried on for some time. Some extensive villages of caves and houses built in the sides of cliffs were found in the same district a year or two ago, and more recent investigations have shown the existence of several others, differing in certain ways from those first observed. The most curious of the newly-discovered towns formed a group of pits, about sixty-five in number, sunk in the volcanic foot hills of the San Juan Mountains. Each dwelling consisted of a central cavity, oval in shape, and about 20 ft. in its shortest diameter, with arched roof, and surrounded by three or four smaller apartments communicating with the central hall by passages, but entirely isolated from the adjoining habitations. Access to each of these groups of rooms was obtained through a square shaft, which had holes cut in its walls to serve as steps, and a groove in one shaft entered at one side of the main hall, and the upper end was surrounded by a fence of loose stones, to guard against the entrance of unwelcome guests. About fifteen miles from this singular town was found another, consisting of a large number of butts, built of stone, in sort of horizontal crevices in the perpendicular wall of a deep cañon. The houses stood in a single row, with the back against the rocky wall, the fronts and sides only being constructed of large stones laid in clay. A narrow path extended along the front of the houses, and the deserted groups formed almost a continuous line of houses for about five miles along the side of the cañon. Many simple utensils of wood and stone were found in the butts, but no inscriptions or other indications of high civilisation.—*Scientific American*.

Demolition of Ancient Houses in Wych-street.

—Within the last few days the hand of the destroyer has been busy in demolishing five of the well-known old houses in Wych-street. The buildings, which have thus been cleared away, consisted of five houses and shops on the south side, extending westward upwards of 100 ft. from near the St. Clement Dances end of the street. The clearance likewise extends southwards into "Booksellers'-row," better known as Holywell-street, embracing a number of dilapidated and rickety structures in that once notorious thoroughfare. Although they have stood for centuries, it is said that the wooden and plaster structures in Wych-street were found to be wonderfully sound. It is stated that new buildings will be erected on the site by a company of capitalists who have purchased the old buildings and the freehold, and that the new structures will have frontages to both thoroughfares. From time to time there has been much talk as to the absorption of these two streets under some scheme for the widening and improvement of the Strand, but so far nothing definite has come of the oft-romoured project, and unless some arrangement is entered into with the parties now in possession the probability is that a few months will suffice to see the completion of new buildings on the site which has now been cleared, and which may have to be cleared again.

Ensilage.—We are informed that the Prince of Wales, after the lecture on "Ensilage" on Monday evening, at the Institute of Agriculture, South Kensington Museum, at which his Royal Highness presided, afforded Messrs. F. W. Reynolds & Co., of Acon Works, Edward-street, Blackfriars, a private interview, for the purpose of explaining to him and his suite the advantages possessed by their patent method of mechanically compressed ensilage, as compared with the use of dead weights. This method was described in detail in the *Builder* for January 5 last.

A Reform in Workmen's Swimming-Baths.

—The *Sanitary Record* mentions, in a report on Continental baths, that at the new Cologne Public Baths the supply of water is continuous, though the charge is little over a penny; and men following dirty employments are compelled to perform a preliminary ablution with soap. Such an arrangement, even where a constant supply of fresh water is not to be had, would doubtless render our own third-class public baths more popular with those of the poorer classes who value cleanliness and object to what is known amongst them as "soup."

Unwholesome Dwellings in Marylebone.—The "Sanitary Chronicles of the parish of St. Marylebone during January, 1884," by Dr. Alexander Wynter Blyth, Medical Officer of Health, contain some statistics and other matters of special interest at the present time. Dr. Blyth appears to have reported (under Torrens's Act) that sixteen houses in Devonshire-place, Lisson-grove, five houses in York-court, and No. 2, George-court were unfit for habitation. He appends the report of the surveyor (Mr. H. Tomkins), who is of opinion that certain repairs which he specifies will render the houses in Devonshire-place fit for habitation. Dr. Blyth appears to be sceptical on this point, and adds that the death-rate of Devonshire-place is, taking the average of the last seven years, no less than thirty-nine per thousand! The Surveyor, however, reports that the structural condition of the houses in York-court is such that, in his opinion, they do not admit of such alterations or repairs as would render them fit for human habitation. Continuing his process of house-to-house inspection of what may be called tenement streets, during the past month Dr. Blyth has personally visited the greater portion of East-street. East-street runs nearly parallel to York-place and Baker-street; the houses are 105 in number, and contain 940 rooms, let to 483 families; in three instances one family occupies the entire house, but the rule is that the whole is let out in rooms. The population of the street is at present 1,642, which gives for every ten rooms seventeen people, or 1·7 to a room. As a whole the population is a very respectable one, quiet, orderly, and clean; only five houses could be called dirty. Each house is provided with a 6 in. pipe drain. Nos. 1 to 19, Nos. 21, 22, 35, 54, 56, 74, and Nos. 88 to 105, have no trap in the sewer. In one house a cesspool was found; the other defects were of a minor character. The death-rate of this street for the past seven years has been 23·9 per thousand.

Cremation.—The chief value of cremation consists in its almost perfect destructiveness. This quality also constitutes its principal drawback. The very process which anticipates the changes of putrefaction and decay removes every particle of evidence derivable from tissue as to the cause of death, whether natural or the result of foul play. The Cremation Society of England endeavours to meet this difficulty by providing that the consent of relatives of a deceased person or of the deceased himself during life shall be a necessary preliminary to combustion of his body. A medical certificate to the effect that death resulted from a specified natural cause is also requisite, or, should there have been no medical attendance, an autopsy must be made by a medical officer chosen by the Society. Now, but for the nominal distinction that autopsies in the latter case are at the present time performed at the discretion of the coroner, there is no difference between these provisions and those which now regulate the burial of the dead. In consideration of the decisive effect which cremation must have on our legal as well as our social system, some further safeguard is surely necessary. Mere certification is not enough.

Resort to post-mortem section in unavoidable cases would not avail. In order to give security against possible miscarriage of justice, an autopsy should be performed in every instance where the body is destroyed by fire. This invariable preliminary, if it be adopted, may somewhat interfere with public acceptance of the society's method; but we regard it as a necessary precaution. —*Lancet.*

Lace Making in Ireland.—Mr. Alan S. Jole delivered lately two lectures on lace-making and Irish lace in the lecture theatre of the Royal Dublin Society. He said that exhibitions of Irish embroidery, lace, crochet, and similar work were held last year in York and London. Ireland possessed an unusual talent for producing such works, but whilst that talent was strongly developed, the absence of correctly-drawn patterns, and, indeed, of a supply of new patterns, was as strongly proclaimed. Without some effort to counteract that poverty in design, the workmanship, however good, must gradually cease to have any value of itself.

Rolled Girders.—Mr. Archibald D. Dawney sends us his last list of sections and weights of rolled-iron girders and joists, kept always in stock. The form of showing these, on a large sheet, which can be hung up, is convenient for immediate reference.

New Building Estates in the Clapham District.—In the neighbourhood of Clapham-road several spacious old mansions, pleasantly situate in extensive grounds, have within the last few weeks been cleared away, and building is now in active progress in the locality, which will shortly lose much of its pleasant aspect and become a thickly-populated urban district. What is designated the Clapham-road Estate consists of upwards of twelve acres, extending in a south-easterly direction from the east side of Clapham-road, near the railway-station to Landor-road, Stockwell. On this estate several new roads, 40 ft. in width, have been laid out, and upwards of 100 houses, of three and four stories in height, have already been erected, and large numbers of similar structures are at present in progress at different points on the estate. The Clapham-road frontage of the estate will be entirely occupied by shops and other business premises. The total number of houses to be erected on the estate is about 400. A short distance to the northward another estate is being similarly laid out and built upon. This estate also extends eastward to Landor-road, whilst on an adjoining estate, in immediate proximity to the Stockwell Small-pox Hospital, which, it appears, has now no terrors for builders, some hundreds of houses suitable for clerks and the well-to-do artisan class, have been erected within the last few months. Altogether, on the different estates on which building is now going forward, there will be about 700 new houses put up.

Paving Apportionments.—At the Stratford Petty Sessions, on Wednesday, the London Labourers' Dwellings Society, Limited, of Blomfield-street, E.C., was summoned by the Walthamstow Local Board for the recovery of 231l. 10s. 10d., being the amount of the apportionment of the making-up of Selborne-road, Walthamstow. Mr. Gilbert Houghton, Clerk to the Local Board, appeared to support the information, and Mr. Firth, M.P., represented the defendants. Formal evidence was given that the defendants' society were the owners of a row of houses in Selborne-road and that the apportionment in respect of the frontages of those houses was the amount of the claim. Mr. Jerram, the Surveyor to the Local Board, stated that previous to the Board making up the road under the Public Health Act it was merely a building estate laid out on the lines of an old footpath, and was a mere bog impassable to the public and to vehicles. Mr. Firth submitted that this was an old public road which had previously been repaired by the parish authorities, and called evidence on that point. Summons dismissed without costs.

Roof Construction.—The fifth of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, jun., vice-principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of March 13th, in the reading-room of the Society of Engineers, Victoria-street, Westminster. Mr. A. T. Walmisley, member of council, in the chair. The lecturer commenced by considering the general nature of a roof, with its different conditions of thrust and strain. After referring to the various sources of roof load, he proceeded to the subject of accessory roofs of different kinds; and then referred in detail to the nature and construction of principals for timber roof work, compound roof work, and iron roof work; directing special attention to their various parts, junctions, &c. The lecturer then went on to describe other details of roof work, purlins of different magnitude, wind-ties, &c., and the various coverings in use. After mentioning some points connected with the subject of erection, he concluded by referring to some special roofs of large span.

Wellington, New Zealand.—The *New Zealand Times* of the 1st ult. mentions the satisfactory completion of the new Post and Telegraph Offices at Wellington, of which a general description is given. Mr. Thomas Turnbull is the architect of the building, his design having been selected in competition. We gave a view of the design, together with some further particulars, in the *Builder* for Oct. 16, 1880. The cost of carrying out the building was estimated by Mr. Turnbull at 17,000l., and he procured a tender from a local builder who was willing to erect the building for that sum. Ultimately, however, certain modifications were made in the plans by the desire of the Government, and the contract for the erection of the building was taken by Messrs. Barry & McDowall at 22,444l.

The Hospitals' Association.—It is now arranged that the evening meetings of this association shall be held at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square. The first will take place on Wednesday next, when Mr. William J. Nixon, House Governor of the London Hospital, will read a paper on "Difficulties Associated with the Administration of the Out-Patient Department, and how best to deal with them." Sir Andrew Clark, Bart., will preside. Papers on the following subjects will be contributed during the present session:—April 23, "How far our Hospitals should be Training Schools for Nurses." May 21, "How the Hospital Sunday and Saturday Funds can be made more useful to the Hospitals." June 18, "Is it desirable that Hospitals should be made self-supporting and, if so, to what extent?"

TENDERS.

For the Staines Infectious Hospital (including fencing) for the Staines Joint Hospital Board. Mr. Hampden W. Pratt, architect, 3, Farnival's Inn, Holborn. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street, Charing-cross.

W. Woodbridge, Maidenhead	£4,281 0 0
W. Brown, Southall	4,225 0 0
J. Shillito, Upper Norwood	4,214 0 0
G. Jarrett, Croydon	4,130 0 0
W. Lodge, Felham	4,113 0 0
J. Burchell & Co., Bedford	4,073 0 0
F. Higgs, Loughborough Junction	4,060 0 0
T. Turner, Walford	3,979 10 0
T. Hardy, Cowley	3,920 0 0
Aldridge & Jenvey, Peckham	3,906 15 0
Hann & Co., Windsor	3,900 0 0
F. Taylor, Uxbridge	3,894 0 0
G. Reavell, Staines	3,844 0 0
R. Averd, Maidstone	3,832 0 0
A. L. Oades & Sons, Egham	3,827 0 0
E. Triggs, Clapham	3,825 2 0
T. Hiscock, Rouslow	3,785 0 0
J. Martin, Addlestone	3,735 0 0
Maiden & Harper, Croydon	3,723 0 0
F. Peters, Hoveham	3,689 0 0
G. Gibson, Southall	3,685 0 0
Martin, Wells, & Co., Aldershot	3,682 0 0
H. C. Belch, Harmondsworth	3,660 0 0
Priestley & Gurney, Camden Town	3,568 0 0
J. Bottrill, Reading	3,469 0 0
Bull, Sons, & Co. (Limited), London	3,469 0 0
Groomer, Rowland, & Co., London	3,308 0 0

For the erection of public-house and two sale shops, situate in Barker-gate, Nottingham, for Mr. John Robinson. Mr. Herbert Walker, C.E., architect:—

B. Crookes	£1,795 0 0
H. Vickers	1,764 0 0
Wool Bros	1,753 0 0
Fisher, Hutchinson, & Ashling	1,740 0 0
Ireson, Wade, & Grey	1,725 0 0
G. Bell & Son	1,720 10 0
Hatfield & Frost	1,700 0 0
A. B. Clarke	1,690 10 0
Bains & Turton	1,675 0 0
Bott & Wright	1,660 0 0
H. Scott	1,651 10 0
J. Noble	1,623 0 0
Keeling & Taylor	1,620 9 0
E. Hind	1,611 0 0
C. Rockley	1,594 0 0
J. F. Price, Ebury-road, Sherwood-rise, Nottingham (accepted)	1,530 0 0

For repairs and alterations to No. 24, Bloomsbury-square Mr. W. S. Payne, architect. No quantities:—

Lawrence & Son	£594 0 0
R. Perkins	565 0 0
Tarrant & Sons	550 0 0
Holliday & Greenwood	477 0 0

For completing tower of St. John's Church, Torquay, Mr. A. E. Street, architect, London:—

E. Abley, Salisbury	£2,285 0 0
C. Trask, Norton-sub-Hamdon	2,207 0 0
W. A. Goss, Torquay	1,895 0 0
Wall & Hook, Brimscombe	1,870 0 0
E. Drake, Torquay	1,860 0 0
E. P. Bovey, Torquay	1,840 0 0
J. Marshall, Plymouth (who built the church)	1,773 0 0
J. Church, Torquay (accepted)	1,750 0 0

For alterations and additions to The Coombe, Streatham, for Mr. E. Gibbons. Mr. W. Ravenscroft, architect, Reading:—

J. Smallbone, Streatham (accepted)	£250 0 0
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For building six cottages in Bailey's-lane, Stamford-hill, for Mr. A. Sanders. Mr. Edwd. Brown, architect, Hanbury-street, Spitalfields:—

J. C. Christoffer (accepted)	£290 0 0
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For alterations and repairs to the White House, Snarebrook, Essex, for Mr. H. Prockter. Mr. Edwd. Brown, surveyor:—

Belcher & Ullmer (accepted)	£202 0 0
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For alterations, repairs, &c., at 25, Upper Montagu-street, for Mr. W. G. Farquhar. Mr. George Low, architect:—

White & Co.	£230 0 0
A. G. Bolding	667 0 0
Holliday & Greenwood	507 0 0
W. B. Oldrey	498 0 0

For the restoration of the chancel of Townstal Church, Dartmouth. Mr. E. H. Back, architect:—

Edgcombe & Harvey, Strete	£90 0 0
Rundell, Kingsbridge (accepted)	75 14 6

For additions to brewery, Wilderspool. Messrs. Davison, Iaskipp, & Mackenzie, architects and consulting engineers, No. 62, Leadenhall-street, London. Quantities for No. 1 contract by Messrs. Curtis & Son:—

Contract No. 1.—Boiler and Engine House.	
J. Gibson, Warrington	£,859 0 0
Neil & Son, Manchester	2,610 0 0
W. Harrison, St. Helen's	2,496 3 9
Treasure & Son, Shrewsbury	2,555 0 0
R. Beckett, Harford (accepted)	2,397 0 0

Contract No. 2.—Boilers.	
The Pearson & Knowles Co.	£850 0 0
Daglish & Co.	800 0 0
Galloway	775 0 0
W. Jones & Son	745 0 0
Thorwill & Warham	730 0 0
J. Watt & Co. (accepted)	695 0 0

Contract No. 3.—Engines.	
Daglish & Co.	£1,421 0 0
J. Watt & Co.	1,385 0 0
The Pearson & Knowles Co.	1,258 0 0
H. Woods	982 0 0
Thorwill & Warham (accepted) ..	890 0 0

For new premises, North End, Croydon, for Messrs. Batchelor, Mr. R. W. Price, architect. Quantities by Messrs. Barber & Co.:—

Ward, Warrington	£1,690 0 0
Pate, Croydon	4,601 0 0
Legg, Croydon	4,469 0 0
Smith & Sons, Norwood	4,432 0 0
Taylor, Croydon	4,408 0 0
Hart, Dover-street, Borough ..	4,336 0 0
Marrage, Croydon and Pancras-lane ..	4,320 0 0

For repairs to the Duke of Clarence, Scawfell-street, Hackney-road, for Mr. B. Hyams. Mr. Edw. Brown, surveyor:—

S. Salt	£192 0 0
C. Marr (accepted)	185 0 0

For the erection of new school, and repairs to existing buildings, St. John's, Redhill. Mr. S. W. Haughton, architect, East Grinstead:—

Holdsforth, Reigate	£2,399 0 0
Daves, Lingfield	2,308 0 0
Past, Mordale	2,182 0 0
Nightingale, Bros., Reigate	2,111 0 0
Pledge, East Grinstead	2,212 0 0
Charwood Bros., East Grinstead ..	1,920 0 0

For the erection of stable, coach-house, and pair of cottages at East Grinstead. Mr. S. W. Haughton, architect, East Grinstead:—

Godley, East Grinstead	£874 0 0
Taylor, Forest-row	825 10 9
Charwood Bros., East Grinstead ..	610 17 6
Beard, East Grinstead	550 0 0
Poster, East Grinstead	495 0 0
Pledge (accepted)	485 0 0

For the erection of villa residence, Denchors, near Epsom, with coach-house, stable, &c. Mr. S. W. Haughton, architect, East Grinstead:—

Goodwin Bros., Epsom (accepted) ..	£970 0 0
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For the first section of work in alterations and additions to Highmore Hall, Oxon. Mr. M. N. Loman, architect, No. 7, Bedford-row:—

Holly & Butler, Nettlesham (accepted) ..	£238 11 6
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For alterations and additions to No. 15, Welbeck-street, for Dr. Jones. Mr. A. E. Hughes, architect. Quantities by Messrs. Sandall, Corderoy, & Selby:—

R. Perkins	£1,637 0 0
Faulner	1,215 0 0
Williams	4,100 0 0
Downs	3,897 0 0
Simpson	3,988 0 0

For repairing (on specification) the swimming-bath, and enclosing the storehouse of the St. James's, Westminster, Public Baths and Washhouses, Marshall-street, Golden-square:—

Iredale, Carnaby-street	£131 10 5
Shiers, King-street	95 14 0
Cook, Wandour-trees	79 15 0
Bywaters, King-street	49 15 0

For painting and whitewashing at the Court Wards of the St. Marylebone Workhouse, for the Guardians of the Poor of St. Marylebone. Messrs. H. Saxon Snell & Son, architects:—

Lathey Bros.	£245 0 0
Bray & Pope	225 0 0
A. E. Wickham	222 0 0
Wall Bros.	189 0 0
Sherman & Sons	185 10 0
A. W. Derby	187 0 0
Wm. Bamford	161 0 0
J. Birch	141 0 0
G. W. Steward	113 8 2
Vigor & Co.	117 10 0

For the erection of the first portion of the South-Eastern College, Ramsgate. Mr. W. G. Osborne, architect:—

W. Martin, Ramsgate	£11,368 0 0
W. & J. Denne, Walmer	9,600 0 0
R. Paramor & Son, Margate	8,760 0 0

* Accepted.

For the erection of a depot, with houses for manager and horsekeeper, in Dyne-road, Kilburn, for Messrs. Carter, Paterson, & Co. Mr. William Eve, 10, Union-court, Old Broad-street, architect:—

Rowe	£4,063 0 0
Nye	3,813 0 0
D. D. & A. Brown	3,780 0 0
Harris & Wardrop	3,723 0 0
Downs	3,720 0 0
Hogers	3,683 0 0
F. Higgs, Station Works, Loughborough Junction (accepted) ..	3,550 0 0

(This list (sent by the architect) is inserted in lieu of the list of tenders for the same job which we printed last week (p. 388), and which was accepted, although authenticated by one of the firms who tendered. Correspondents should be more careful in these matters.)

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

F. M. (cannot recommend books—see below).—G. L. (finished drawings are always sent, there is no reason why pencil drawings should not be sent, but they should be sent in a separate envelope in most cases).—A Traveller (should have sent his name).—B. T. G. (E. T. Newcastle (if you will send and address we will reply by post).—J. H. M. (should send list and amounts)—H. & P. (difficult).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement with the number of January 15, and a COLOURED TITLE-PAGE was issued the following week, in substitution for that published previously.

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Letters will be forwarded if addressed in envelopes are sent, together with sufficient stamps to cover the postage.

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The Builder.

VOL. XLVI. No. 2147.

SATURDAY, MARCH 29 1884.

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The Architectural Profession.



HAT the architec-

tural profession in

England is at pre-

sent at a somewhat

critical point in its

career seems to be

a fact tacitly ad-

mitted by the

members of the

profession them-

selves, if we may take as a cri-

terion of their feeling the decided

activity displayed in the direction

of reform of one kind or another, which is

showing itself in several directions among the

individuals or the bodies representing pro-

fessional interests. We have at this moment

the two representative societies in London,—

the Royal Institute of Architects and the

Architectural Association,—making, inde-

pendently of each other, inquiries and sug-

gestions as to alterations in their constitution

or mode of action for the future, with a view

to increase their representative completeness

or their educational efficiency as corporate architectural bodies. We have at the same time a certain undefined stirring-up of architectural dust by some persons, apparently members of the profession, who are endeavouring to hoist a flag of secession and rebellion, and to set up some sort of new architectural establishment with a sort of signboard flourish of its own; an advertisement in which *mens conscia recti* is mixed up with "no connexion with the establishment over the way." We regard this demonstration, however, as little more than a storm in a saucer, got up to serve the interests of persons who are never content unless they are blowing their own trumpet, and who are only following what has of late become a fashionable habit of advertising in the artistic world, by getting into a small group at the corner of the street and shouting out that everything and every one is going to the dogs except themselves. Demonstrations of this kind generally end in smoke, or in the falling-out of the demonstrators; and if the already existing representative bodies of architects fail to keep up or increase their prestige it will be from other causes than the rivalry of a small and apparently obscure but noisy band of oppositionists.

To return to the more immediate subject of the existing fully-constituted architectural societies, the Institute of Architects has been specially concerned just now over several matters of internal reform, various in their nature and importance. One of these, the question as to the election of the Council, is chiefly of importance as striking a blow at the very conservative constitution of the Institute Council, one of the minor matters which tend to fetter and restrict a policy of progression. At the business meeting, ostensibly private, held last Monday, it was announced that the Council, in response to suggestions made at a former meeting and before referred to in our columns, proposed the introduction of a system whereby two members should retire annually from the Council, and if the meeting of the 24th had adopted their proposition they were prepared to move the alteration of By-law XIX. in accordance therewith. Mr. Ridge, however, proposed an amendment, to the effect that this was an insufficient response to the reference made to the Council at the meeting on the 7th of January last,—an amendment which was adopted by the small majority of three, no member of the Council voting for it. It is better that constitutional decisions in a society should be carried by larger majorities, but the result shows a determination on the part of a considerable number of the habitual attendants at the Institute meetings that a whole-some degree of change in the administrative body should be kept up; and it is well that it should be so. Another suggestion which was carried at the last meeting is of more importance in regard to the relation of the Institute to the public, viz., that means should be taken for extending the admission of Associates, who can now enter only by an obligatory examination, to applicants in the colonies, who may not be able to pay a visit to England for the purpose of passing the examination in the usual way; and that such candidates should be privileged to be examined by letter. This is a very important move, as it appears to be a response to a real demand on the part of colonial architects, and a demand which the immediate action of the Institute in the matter will probably tend to increase. A further and still more important movement arising out of the same subject of the obligatory examination for Associateship, is one which contemplates in the end making all membership of the Institute dependent upon an obligatory examination in professional attainments and knowledge.* It appears that, since the establishment of the obligatory examination for associateship, applications to be admitted as Fellows have been received from gentlemen younger and of less professional experience than many who had submitted themselves as candidates for the Associateship. Here was a manifest injustice to those who had elected to pass the ordeal of an examination; and the Council wisely took upon themselves

to depart from technical exactitude by refusing or deferring such applications till the matter could be further considered. They believed that many young men, of sufficient ability and education to pass the examination as Associates, avoided submitting themselves to it, on the confident assumption that, if they waited a few years, they could be admitted as Fellows without the necessity of any previous labour or test of merit. Such a state of things being "prejudicial to all concerned," the Council submitted to the general meeting on Monday a recommendation to enact a new by-law, to be numbered XIVa, to the effect that after May, 1887 (which will be the fiftieth year of the incorporation of the Institute), no candidate shall be recommended for election as a Fellow who is not already an Associate, except in the case of such candidates as may, by a special resolution of the Council in each case, be exempted. The final discussion of this important resolution was, however, deferred, owing to the late hour at which it was brought forward, for more leisurely consideration at a future special meeting in the course of next month.

Now, this is a scheme which, if carried, as we have very little doubt it will be, ought to make membership of the Institute really a practically valuable title, much more so than it has hitherto been. The proposition has been regarded with interest, and even with enthusiasm, by some of the provincial architectural societies; the Leeds Society, for instance, sent round a special circular to beg all members who had the best interests of the profession at heart to vote for it. We can only wish that some metropolitan architects showed the same *esprit de corps*. In the present position of the architectural profession such a system of condition of membership of the Institute would be, if generally accepted, the most valuable means of strengthening the profession in public esteem and public confidence that could be desired. It can only fail to be so through the selfish policy of those who refuse to join hands or to remember that unity is strength. We have before said that we are not among the admirers of the Institute of Architects as it exists. We consider it is in many ways behind the times, and requires new life to be infused into it. But it has all the machinery for work as a central representative body: it is making strenuous and very well-considered efforts to improve that machinery; and those who weaken its action and influence with the public by standing apart and refusing to co-operate, are taking upon themselves the responsibility of being stumbling-blocks in the way of the strengthening of the hands of the profession, their own included, by the best practical means available. As to the artistic

* Except when the Council might see occasion to abrogate the rule; as in the case of architects of known and recognised ability who had not previously been Associates.

side of the question, we repeat that if the artistic element is not as well represented as it ought to be in the Institute at present (as it most certainly is *not*, that is in the main the fault of those who allow things to be so; who refuse their own aid and then complain of the deficiencies which they might themselves, if they were less egotistical and indifferent, do much to remedy. The mere fact of the excitement and interest roused by the election of Mr. Street, shortly before his decease, as President, and the exceptionally crowded meeting which his first appearance in the chair attracted, shows that there is no want of persons within the ranks of the Institute to appreciate artistic ability and to show honour to the "art-architects," if they on their part will show any disposition to labour for the good of the republic. If they will not, they cannot expect that the public will show adequate respect to a house which is so suicidally divided against itself.

The sign of movement which we referred to in the junior society, the Architectural Association, is, of course, of less public importance, though its occurrence at this juncture is significant of the general tendency among the profession to turn over a new leaf in some way or other. The Architectural Association was essentially a draughtsmen's society, and the special reason which seems to have moved its president, Mr. Cole A. Adams, to send round a circular asking the advice of all the members as to possible changes and new regulations, is significantly characteristic of this fact. The President of the Association seems to have been rather dismayed by the fact of the great falling-off in the attendance in the classes of design as compared with a recognisable increase in the attendance in the classes of construction. The other matters referred to in his circular are very minor ones, interesting only to those directly concerned. But in regard to this main point we should really rather be disposed to congratulate the Association on having apparently discovered the fact that construction is, after all, the basis of architecture, and that much which is called "design" means really only "draughtsmanship." It may be presumed that a certain number of members of the Association do not attend both classes, and that some who have given too exclusive attention to drawing have felt the necessity of learning more about construction. On the whole, this appears to us to be a satisfactory indication that the Association is in a healthy condition, and that, feeling that architects have in recent days much neglected the practical side of their profession in pursuit of the enjoyment of making effective drawings, some of its members are desirous to restore the balance. On the whole, the Association has as much overweighted the drawing side of the architectural profession as the Institute has overweighted the practical and business side, to the neglect of art. The two must go hand in hand, and be equally studied as the necessary complements of each other, if the architect of the future is to take the same place in public confidence and respect as was gained by some of the eminent architects of the past.

ANOTHER HISTORY OF ANCIENT SCULPTURE.*

THE classical archaeologists of to-day fall naturally into four classes; we might, indeed, say they are of four grades. The work of these four grades is essentially distinct in character. Now that works on archaeology are multiplying thick and fast, it seems important to distinguish clearly the function proper and peculiar to each. Without such distinction we cannot rightly estimate the value of an author's writings. We are apt to demand what is impossible, or to be content with what is inadequate.

First and foremost there is the archaeologist who discovers. From him we have a right to demand, if he is to occupy the first place, the

peculiar, incommunicable instinct of the explorer, and the precise, scientific record of the place and circumstances of his discovery. We need not necessarily go further and demand that he should theorise on what he finds. It is frequently better that he should leave the task to others less intoxicated with the new joy,—for him the facts of discovery are so tremendous that opinion concerning them may well seem impertinent. Next, and scarcely of a lower grade, is the archaeologist who creates, not fact, but opinion; who sees for the first time, not the monuments themselves, but the significance of these monuments, their historical place, their contrasts and analogies, secret from others, hidden sometimes from the eye of the discoverer. From him the archaeologist of the second grade, we ask that his opinion be based on the sober estimate of fact; that he give us, so far as conviction be communicable, a reason for his faith. Sometimes he will speak as a prophet; then we may wait for the confirming evidence of future discovery.

Third, and separated by a vast gap, comes the archaeologist of the third class. He absorbs the opinions of others, gives them in succinct and intelligible form to the outside world, selects one opinion from the many as his own choice, and substantiates his preference. From him we demand that he should state the opinions of others accurately, and justify his selection. Fourth, there is the archaeologist who popularises his subject. His work is to make the skeleton of fact and opinion live and breathe, to clothe it with flesh, and breathe into it life, so that what was before to the unlearned dry and dead, shall live before him as a beautiful, vital whole, so that the dead men of the past rise and speak before him. What we demand of this fourth archaeologist is that his constructive fancy shall vivify without falsifying this past which he has learned to know.

Mrs. Mitchell belongs to the third class, and her work, judged by its standards, is excellent. She lays no claim to the discovery either of fact or opinion, but she has conscientiously, and for the most part accurately, absorbed and reproduced the opinions of others. This may seem slight praise, but when we consider how vast and inaccessible the material, we see that *sui generis*, as a compiler, her rank is high. It is not so much that original thought is strangled in the birth by the mass of alien opinion, as that the quality of mind necessary to the compiler and the thinker are essentially distinct and rarely coexist.

In the preface Mrs. Mitchell claims kinship with our fourth class of archaeologists. She says, "I have attempted in the present work to treat the sculptural monuments of the different nations of antiquity, and to build up some semblance of the stately fabric of old. Many, alas! are the blocks still lacking to complete the structure of an exhaustive history of ancient sculpture; but if we surround the mute monuments existing with the faiths out of which they sprang, and pour upon them the light of national custom and thought, they will become eloquent witnesses to the art-life of those remote ages." This hope is never, it seems to us, fulfilled; details many and interesting are given us about the life of the past, but the past never lives again. Mrs. Mitchell has as little instinct for reconstructing form as she has sense of the fitness of language; indeed, we are constantly and painfully made to feel that an author whose style is so inopportune is essentially devoid of that spirit of *συνεισφορά*, which she herself tells us was characteristic of Greek art. A book on Greek art should surely of any bear the stamp of a beautiful decorum of language. How are we to trust the instinct and judgment of an author who sins against taste by the unmeasurable use of promiscuous adjectives and the coining of new-fangled, impossible words. What, in the name of the English language, are "troves"? Who can bear to be told that over the face of the Hermes of Praxiteles hangs "a delicious veil of soulful interest"? Or that art descends "from the heights of Olympus through ravishing vales"?—or of the supposed Demeter (p. 339) that "so noble and ravishing is its beauty that in its contemplation we would hush the mur-

mur of conjecture"? Two of the supposed Fates on the eastern pediment are also of "ravishing beauty," and the third combines "majesty of form with ethereal grace re-echoed interminably in the countless quietly fluttering folds of the drapery." In this drapery Mrs. Mitchell finds subtle tenderness and exquisite harmony, and a dream of beauty and queenly majesty. She is further delighted by the "majestic nude Olympus counterpoised by the fluttering drapery and delicious form of the gently-reclining goddess" at the other end of the pediment. Now it is time that a protest was made against this stringing together of adjectives and adverbs. Exuberant diction is not criticism; indeed, in this particular instance, Mrs. Mitchell's own critical faculty has been completely "ravished" by the fumes of her intoxicating language. She accepts Professor Brunn's theory that the so-called Theseus is the mountain god Olympus, and that the so-called Fates are "personifications of the graceful, fleeting clouds." The theory is, indeed, a poetical one, but it has no shadow of support from artistic tradition. As regards opinion, the snare that constantly besets Mrs. Mitchell is that she cannot soberly view a theory propounded either by Professor Brunn or by his followers, Professor Milchhofer and Dr. Furtwaengler. Of Professor Milchhofer's Cretan theory (*Anfaenge der Kunst*), she says, indeed, that it awaits further confirmation, but so complete is the abstract she gives of his book, that some note of warning should have been sounded that this ingenious fabric is built upon a basis of evidence as stray and shifting as the sand.

We turn gladly from the ungracious task of censure to note what is really admirable in the book. The student of Greek art has before him for the first time a really complete *répertoire* of fact and opinion. Without seeking to thread the trackless paths of German pamphlet and periodical literature we can know fully and precisely what the French have found at Delos, the Germans at Pergamos and Djilbaschi, the Americans at Assos. If he wants to go further let him turn to the "Notes and References," which to the archaeologist are the most valuable part of Mrs. Mitchell's book. There he has before him collected, with a fulness and accuracy which are beyond all praise, the whole literature of the subject. Even where, as in one or two cases, the work cited appears to have been left unread or read to little profit, the citation is valuable. These Notes and References are followed by an index of quotations from classical authors and a general index of equal value. Still further we have a table of museums, which should do good service to the travelling student; a glance down its carefully arranged columns will show the student or the intelligent tourist what he has to look for in Berlin, Florence, Munich, Naples, Paris, Rome. When we consider the labour that must have gone to the formation of these tables we do not wonder that the book is the outcome of ten years of patient work, and we are inclined to forgive all other shortcomings, even its lamentable style. The book is profusely illustrated. We have 294 woodcuts of very varied excellence, six phototype plates of great beauty, and an accompanying portfolio of twenty phototype plates. Here at once is a wealth of material for study that the English student has never before possessed. Other books by archaeologists of other grades will supply what is lacking in originality, in trained archaeological insight, in refined taste. This book of Mrs. Mitchell's is unique as a *répertoire* of material.

SCIENTIFIC OPINIONS ON WATER-SUPPLY.

THE Society of Arts has recently devoted one ordinary and two extraordinary meetings to the discussion of the important subject of the national water supply.

On the 12th of March, Mr. Salt, M.P., in the chair, Lieut.-Gen. Rundall, R.E., C.S.I., read a paper entitled "A System of National Water Regulation necessary in regard to

* A History of Ancient Sculpture. By Lucy M. Mitchell. London: Kegan Paul, Trench, & Co., 1883.

Supply, Floods, Drainage, and Transit." Of this able and exhaustive essay, in which "the experience of a lifetime in dealing with the water question in its several phases" has enabled the writer "to pronounce confidently on both its administrative and engineering features," our limits allow us to do little more than express a general admiration, and a concurrence with the spirit of the whole, as well as with much of the detail. It would, however, be unjust, both to the author, and to the readers to whom we recommend the careful study of General Rundall's paper, to fail to indicate one or two points in which the experience attained on the vast rivers, canals, and reservoirs of India may prove misleading if applied to the water features of England without due modification.

General Rundall advocates the construction of storage basins for the purpose of preventing damage from floods, and of supplying water both for navigation and for domestic use. Where nature has rendered the existence of such basins practically possible, she has not unfrequently herself supplied them, as in the Cumberland, Westmoreland, and North Wales lakes. In the Thames valley the case is very different. General Rundall estimates that basins to contain 8,760 millions of cubic feet of water could be constructed for 3,240,000*l.* But at the depth which he gives of 30 ft. such reservoirs would cover an area of 9,653 acres, or rather more than 15 square miles. The provision and purchase of such an extent of land on the borders of the Thames, even independently of any expenditure on banks, sluices, conduits, and other works, is so manifestly impracticable that it is only necessary to call attention to the figures. Nor is it a question of small differences. A rainfall of 1 in. over the basin of the Thames above Kingston gives, according to Mr. G. J. Symons ("Proceedings Inst. C.E.," vol. xxii, p. 6), a volume of 53,375 million gallons. Although but a small portion of the average rainfall of the year runs off through the ordinary river discharge, the case is very different in heavy rainfalls, when nearly the whole depth of water collected requires immediate discharge. In 1875 the July rainfall over the Thames valley ranged from 4.15 to 6.46 inches; and in October of that year more than 3 in. of rain fell in one day at Banbury. To store 4 in. of rainfall, according to authorities cited by Mr. G. J. Symons in his valuable monograph "On the Floods in England and Wales in 1875" ("Proc. Inst. C.E.," vol. xiv., p. 9), would cost at least 20,000,000*l.* And in the event of a rainstorm occurring when the reservoirs were full, the damage caused by the ensuing flood would be unabated. It is thus clear that in such a valley as that of the Thames the construction of reservoirs as suggested by General Rundall does not comewithin the practical work of the engineer; and such also was the opinion expressed by Sir R. Rawlinson. The necessity of constituting a central authority for dealing with the water of at least each great system of river outflow, to which attention is called in the paper, has been long since fully advocated in the columns of the *Builder*. It may be said to be now fully admitted, as a controlling principle, by every competent authority on the subject, with the unfortunate exception of Parliament. As to the last head of General Rundall's paper, that of transit by inland navigation, the evidence, to which the General himself contributed, taken before the Select Committee on Canals is of conclusive weight. Mr. Salt, the very able chairman of that committee (who presided as before mentioned at the meeting), justly remarked "what was really wanted was a strong board of men thoroughly conversant with water matters, and having powers to deal either with the whole country or with very large areas." We have as yet heard nothing as to the re-appointment of Mr. Salt's committee during the present session. What has already been done has so far narrowed the entire range of the questions raised by General Rundall, that they may be said to have passed out of the region of vague speculation. The outcome of the study of the subject, for a series of years, is to a great extent definite

and undenied; and what the country now requires is, not so much that further inquiry should be made, as that legislative sanction should be given to those great principles of water regulation which, long since admitted and acted on in Italy and France, are fully accepted by English engineers; and are uncontested, except by that spirit of general supineness which it seems to require great disasters to overcome.

The evenings of the 13th and the 21st of March were occupied by the Society of Arts in the discussion of a paper by Dr. Percy Frankland on water supply. The title of the paper which the members were invited to discuss was "The Upper Thames as a Source of the Water Supply of London," but nothing was said by the lecturer as to the Upper Thames. The aim of the paper was to show that the admission into a river of either crude sewage, effluent water from purified sewage, or surface drainage from manured fields, was a source of danger to human life and health for which the chemist could suggest no remedy; and that river water ought for that reason to be abandoned as a source of supply for domestic use, deep wells being resorted to instead. The tables and diagrams exhibited in support of this view were of rather ancient date, and nothing was brought forward by the lecturer with which the students of the subject were not already fully familiar.

Sir Lyon Playfair, who occupied the chair, expressed a doubt as to the quantity of water obtainable from the chalk,—a point on the determination of which any practical issue from the statements of the lecturer must altogether depend. Mr. Norman Bazalgette altogether opposed the argument of the lecturer, and referred to the steps which had been taken by the Metropolitan Board of Works for the protection of the river, and to the eminently healthy condition of the metropolis, as shown by the death-rate. Sir F. Nicholson, on behalf of the Conservators of the Thames, referred to the measures taken by that body for the purification of the river; and it was further pointed out that a sacrifice of more than twelve millions sterling for the object of obtaining an imaginary supply of water was not a subject for serious discussion.

On the second evening Dr. Frankland spoke in support of the lecturer, without adducing any new points in support of his well-known views. Dr. Meymott Tidy, in a very long and very energetic speech,—many parts of which convulsed the meeting with laughter,—adduced the results of several thousand analyses made by himself and by Dr. Odling, Professor of Chemistry at the University of Oxford; and gave facts in support of the opinion that river water purified itself by oxidation, in the course of a comparatively short distance of natural flow. Mr. Cresswell gave some details of what is being now effected at Aylesbury, for the purification of sewage; and complained of the figures exhibited by Dr. Percy Frankland as "antediluvian." Dr. Jabez Hogg entirely contradicted the statements of the preceding speakers to the effect that the moribund poison said to be communicated to water from sewage could not be detected by the microscope; and described the various forms of microscopic life which were the product, and the cause, of different diseases, which he further stated to be, as far as was known, indestructible by any applicable process. The chief instance brought forward, however, was one taken, not from any river supply, but from the contamination of a well at Caterham. The discussion was adjourned until some day after Easter.

It is evident that, in order to derive any practical utility from a debate of this description, the question of the natural limits of supply, which was entirely left out of sight by almost every speaker, assumes a controlling importance. Nor does it seem to be a matter at all conducive to sanitary reform to devote evening after evening to the discussion of questions of transcendental chemistry, in which eminent chemists are in discord, both with each other and with medical men, at a time when the subject of the best mode of destroying the poison of sewage, and of rescuing the Thames

from the terrible pollution to which it is now exposed at Barking, has assumed a shape which presses for a practical solution. That the germs of disease are readily to be detected by the microscope is, if invariably true, a matter for congratulation. But men of science must cease to contradict, not only one another, but themselves, before they can expect that the public will listen to statements which as yet only go so far as to suggest cause for panic, rather than practical efforts for improvement.

NOTES.

WE have received notice of the forthcoming publication of a work of considerable interest by Baron Geymüller, to be entitled "Raffaello Architetto," or, in the more detailed record of the title-page, "Raffaello Sanzio studied as an Architect, by the aid of New Documents." Raffaello, of course, was not essentially an architect; that is to say, he had not the true feeling for the constructive basis of the art, without which architecture becomes only a plaything; unless, indeed, any of Baron Geymüller's "new documents" should contain matter to alter our convictions in this respect. But he seems to have had the power of direct and unaffected expression in architectural design, as shown, for instance, in his front of the Pandolfini Palace, with its elegantly treated windows, contrasted with the heavily rusticated doorway; and, at the least, everything about him and his artistic developments must be of interest in one sense or another. Those who are acquainted with Geymüller's splendid work on Bramante, reviewed at length in our pages some time back (vol. xl., p. 263), and remember the remarkably interesting matter contained both in the illustrations and in the text, will consider his name as editor of the Raffaello documents and drawings in itself a guarantee that the promised publication will be of no ordinary value.

ANOTHER architectural publication, which should be of some interest, from specimens of the plates which we have seen, is "L'Architecture en Suisse, aux Différentes Époques," consisting of various remains collected and published by MM. André Lambert and Alfred Rychner, architects. It is to include fifty-seven plates, executed in ink-photography, in imitation of washed Indian-ink drawings, but far more fine and delicate in texture and effect than any process adopted for architectural publications in this country, which seems to be sadly behind the Continental lithographers in these methods. On the other hand, the drawings illustrate, in their style and feeling, that peculiar mechanical precision characteristic both of French and German architectural illustrations, to which we referred the other day in an article on the subject, and which gives to some of their illustrations rather the aspect of working-drawings than of delineations intended to show the real effect of the structure as it would appear to the eye. In their own style, however, the illustrations, as far as we have seen, are admirably executed, and the work will apparently represent some rather unusual and out-of-the-way architectural details and combinations, showing how Renaissance architecture posed herself on the free soil of Switzerland, with a certain interesting and quaint licence of style. The work is to be published by Herr Georg, at Basle.

THE long dispute and subsequent litigation between the River Lea Conservancy Board and the Corporation of Hertford has resulted in the delivery by Mr. Justice Williams, on the 22nd inst., of judgment for the defendants (the Corporation of Hertford), with costs. The able and careful summing up of the judge on the whole evidence went to show that the Corporation, exercising the powers originally conferred on the New River Company, and in 1868 transferred to the Hertford Corporation, had the right to discharge the effluent from their sewage works into the Lea, on the condition that they adopted the best known process of purification, and carried out the work in the

most efficient manner. The Conservancy Board appears to have been unable to establish, by the evidence of their own experts, that the Corporation could be said to have failed in either of these undertakings. They fell back upon the fact that there was a bank of offensive mud near the outfall of the sewage carrier, known as the "Manifold ditch," into a nearly stagnant, or at least very sluggish, backwater of the Lea, and ascribed this to the effluent, while admitting that the effluent on leaving the sewage works satisfied the most rigorous tests for every purpose short of being used as drinking-water. As to the offensiveness of the said bank of mud, the evidence seems to have been exceedingly contradictory, and that which would connect it with the effluent merely presumptive. "The scientific witnesses on the part of the defendants showed that there was absolutely no chemical difference between the water of the Lea before and after the water of the Manifold ditch joined it." This goes to confirm what we observed the other day in regard to the scare about the Lower Thames Valley drainage scheme, that if the best means of purification were employed, we did not believe those who used the river for recreation would ever know that the effluent water was in it if they were not told. We draw attention to the subject partly on account of the misleading comments on the case on the part of some of the daily papers, which either took no trouble to understand the real bearing of the evidence, or suffered under inherent incapacity to do so.

The Kyrie Society held a meeting in the Rubens Room at Grosvenor House last Monday, the Duke of Westminster presiding, when Miss Octavia Hill read a paper describing the objects of the Society, which are, probably, better understood and appreciated now than formerly. Partly, perhaps, from a too great admixture of the class of sentimentalists who have been christened "aesthetes," as collaborators, the Society gained in some quarters, not quite without reason, the credit of being a kind of institution for painting dados on the walls of "the dwellings of the poor," and generally bringing them into harmony with "aesthetic" tastes and habits; and, as this was to be done free of expense to the recipients, it was somewhat difficult to distinguish this from a species of artistic pauperisation. But Miss Hill's paper on the present occasion showed that, in her view at least, the objects of the Society are both wider and more practical than this. For example, she mentioned that during the past year three disused burial-grounds had been handed over to the Society to be laid out, previously to their being taken over by the several vestries of the parishes in which they stood, and funds amounting to 700*l.* had been collected, which would enable the Society to complete all three. Arrangements had been made for their taking in hand another such garden in a very crowded neighbourhood in the south of London, at a cost of about 300*l.*, of which 50*l.* was already in hand. Besides the living colour of flowers, they are trying to introduce suggestive inscriptions in mosaic on the blank walls which often bounded the gardens. The Society has also given musical performances, by means of its own choir and volunteer assistance in the poorer quarters of London, which, as we have had occasion to know, have given much pleasure to large audiences whose geographical and pecuniary conditions alike put them out of the power of hearing good music under ordinary circumstances. This is truly philanthropic work in its spirit and its present results. We only use that qualifying expression in order to point out that, on true social principles, such voluntary dispensing of the decorations and beauties of life ought to be regarded only as a temporary expedient for awakening the minds of the less educated and poorer classes to such beauties, in the hope that in time they will develop the spirit and the means to bring their own exertions to bear in providing these means of rendering life brighter and more enjoyable. Any schemes for doing this for them, without exertion or expense on their part, ought to be regarded as in their nature temporary; and here, probably, Miss Hill will

not disagree with us. But at the present moment the mere awaking the minds of the people to see the beauty of nature and art is an admirable and almost necessary work, preparing the way, we may hope, for a more permanent enlightenment.

An inquiry was commenced on Wednesday last, the 19th instant, and was continued on the following day before Sir Henry Arthur Hunt, C.B., at the Surveyors' Institution, Great George-street, with reference to the notice served upon the owners of the National Standard Theatre, Shoreditch, by the Metropolitan Board of Works, under the powers conferred upon the Board by the 11th Section of the Metropolitan Management and Building Acts Amendment Act, 1878 (41 and 42 Vict. chap. 32). Mr. Frederick Meadows White, Q.C., instructed by Mr. Thomas Burton, appeared for the Board, and Mr. Mansell Jones appeared for the appellants, Messrs. John and Richard Douglass, the lessees of the theatre. The points in dispute related to the construction of the staircases from the balcony level to the upper circle, the provision of a new staircase to the gallery, the separation of the theatre premises from premises in other occupation, and some minor matters which were not seriously contested by the appellants. On behalf of the Board Mr. John Hebb, the Assistant Architect to the Board, Mr. John Whitchcord, Mr. Henry Currey, and Mr. Francis Rider were called as witnesses, and Mr. C. J. Phipps, Mr. Henry Lovegrove, and Mr. Richard Douglass gave evidence on behalf of the lessees. The arbitrator viewed the theatre on Monday last, but has not yet made his award.*

In 1880 the Corporation of the City of London invited designs for statuary to be placed on the four pedestals of Blackfriars Bridge, and offered six premiums,—viz, two of 250*l.*, two of 150*l.*, and two of 100*l.*, the models for which the premiums were to be paid becoming the property of the Corporation. In response to this invitation some fifty designs were sent in, but they were not exhibited to the public. The premiums promised were duly paid, but nothing further resulted from the competition. It is now stated that the Corporation have resolved to adorn the four pedestals with four equestrian statues, and have abandoned their original intention of completing the bridge by the erection of allegorical groups of sculpture, on account of the expense. Professor Fabbrucci gained one of the premiums of 250*l.*, for a design representing the Triumph of the City of London, which was much admired at the time; but we understand that Mr. Fabbrucci has not been given a commission for one of the equestrian figures, as he might reasonably have expected would be the case. The whole matter appears to be utterly mismanaged, or else "managed" in another sense. On the utter unsuitability of the existing pedestals for any statue which could be put upon them we have before commented.†

A CASE of some importance was decided in the Leicester County Court at the close of last week, bearing especially upon the question of provision for the carrying off of storm water in a sewerage system. Mr. Cooper, a tradesman in Leicester, had suffered what appears to have been a very serious and indeed intolerable nuisance, accompanied by considerable injury to his trade, by the rising of sewage, as he described it, in his basement on several occasions of heavy rain during last year; "the sewage rose in a water-closet in the basement and spread all over the basement, rising to a height of nine inches;" and in subsequent rains this very unpleasant visitation was repeated in a more aggravated form. Of course it is incorrect to say that "the sewage" rose; what rose into the house was storm water carrying sewage matter with it. Mr. Cooper sued the Corporation for damages to trade and premises to the extent of £25. The defence was that no

negligence could be shown on the part of the Corporation in the construction of the special sewer in question, or in not keeping it in proper repair; that the nuisance arose from an exceptional flow of storm water, which the capacity of the sewers was not sufficient to carry away at once, and that the blame, if any, was chargeable upon the whole sewerage system, not upon special negligence in regard to maintaining the works. The jury found for the Corporation, who did not, however, claim costs. It seems probable from the report of the case that the basement in the plaintiff's premises may have been exceptionally low; it had for some years been subject to flooding. With every sympathy for the plaintiff's position, we hardly see that the finding could have been otherwise under the circumstances. It is pretty generally agreed among the best authorities on sewerage systems that it is not advisable, on practical or on economical grounds, to construct a whole system of sewerage of such capacity as to carry off exceptional flows of storm water.

A CORRESPONDENT of the *Pall Mall Gazette*, under the signature "W. P.," writes to suggest that what he rightly calls "Stevens's magnificent monument" to the Duke of Wellington should be placed in front of the cathedral, after the removal of the Queen Anne statue, and completed by its intended equestrian figure; so that, *en plein air*, and with plenty of space around it, the work would really be seen, instead of being poked away into a corner in the worst possible light, as it is at present. There is no doubt the position would be a splendid one, but it is a question whether the bronze sculpture is not too artistically valuable, and some of the ornamental detail (not the best part of the work, by the way) too delicate, to be exposed to the tender mercies of the London atmosphere. The work was intended unquestionably to be under cover, and executed with that idea; and if we look at the effect of the exterior atmosphere of London upon other bronze statues which we might be very happy to lose, it is doubtful whether we should be doing wisely to expose to its influence one of the very few great monumental works which modern art can boast. Considering the density of the average English mind on these subjects, however, it is gratifying to meet with even one correspondent in a daily paper who knows that Stevens's work is a great one, and is aware that it is "altogether wasted" at present.

CONCERNING this same national density upon subjects of this class, we had a fresh reminder the very next day, in the discussion in the House of Lords on Lord Stratheden and Campbell's motion that the other Duke of Wellington statue, the *bête noire* of recent art discussions, should not be moved out of London, and that a humble address to that effect should be presented to her Majesty. Against the feeling that the statue ought, as a matter of association, to remain in the neighbourhood of Apsley House, we have nothing to say; it is a natural one enough, and we were disposed to recommend it until the Aldershot suggestion seemed to promise a site at once suitable in association and in regard to scale. But in the process of this same debate did two noble earls, those of Galloway and Hardwicke to wit, declare that they could not understand, now the arch was rebuilt, why the statue was not put up there again, or why its position there should be objected to. We, for our own parts, have explained why three times since the recent rebuilding of the arch first brought the subject into fresh discussion; we know not how many times previously; but there,—we give it up.

At the annual dinner of the Institution of Civil Engineers, on Wednesday evening, the speeches turned very much on the subject of education, of course on its scientific side, and the advantages of a more thorough grounding in the principles of mechanics, as part of an ordinary liberal education. Such different speakers as Earl Granville and Sir Lyon Playfair sounded the same string on this subject, though touching it, we need not say, with a very

* We print elsewhere the structural alterations required, in full, as of some interest to those who may have to build or improve existing theatres in the future.

† See *Builder*, p. 5, ante.

different hand. Engineers are, on the whole, a little too much inclined, we think, to regard life from an engineering point of view, and hardly require encouraging on that head; but it is unquestionable that a larger infusion of mechanical science into general education is much needed; and if that species of educational reform were accomplished, one result of it would probably be that we should have less of that foolish sentimental outcry constantly made against new railways and railway directors, engineers, and contractors, by people whose education, and consequently their sympathies, are so one-sided that they cannot in the least understand the great interest of engineering work, the energy, the talent, and the high moral qualities even which it calls into action both on the part of principals and subordinates, and appear almost to prefer to be stupidly blind on the subject.

THAT Mr. Albert Moore has been elected a member of the Royal Society of Painters in Water Colours is, or should be, rather a subject of congratulation to the Royal Society than to Mr. Moore. With all the interest and beauty of their exhibitions in regard to landscape painting, the Society are very short of high-class figure-painters. They have no one to pit against Mr. Linton, the Corypheus of the rival Society, although they are much stronger all round. We are not forgetting Mrs. Allingham, but her exquisite works are rather idyllic combinations of figure and landscape than figure-pictures in the stricter sense. Mr. Tadema contributes little now, and does not put forth his strength in the Society's exhibitions; and Mr. Walter Duncan has been unequal and rather disappointing. Mr. Burne Jones they drove away, in foolish deference to a fit of prudery on the part of some "Philistines." So there is a pretty clear field before Mr. Moore for some new developments in the gallery in Pall Mall East.

SPIITALFIELDS MARKET.

WITHIN the past few weeks Columbia Market, in Hackney-road, has received what gives every promise of proving a valuable stimulus to its waning fortunes. The fruit and vegetable salesmen have removed hither from their stalls underneath the Great Eastern Railway goods station at Bishopsgate Without. Their migration followed upon a recent decision of the Court of Appeal,—*Goldsmid v. Great Eastern Railway Company*, when Lords Justices Cotton, Lindley, and Fry gave unanimous judgments. Briefly stated, the facts are as follow. Sir Julian Goldsmid, lessee, with others, owners of Spitalfields market and market estates, claimed franchise to sell vegetables and fruit under certain charters of Kings Charles II. and James II. In 1881 the railway company adapted the arches beneath their new goods station at Bishopsgate into a mart or depot and let them to dealers in fish, vegetables, and fruit. The plaintiffs contended that these proceedings interfered with their own market and market rights. They obtained an injunction in Vice-Chancellor Bacon's Court accordingly. On the appeal an interesting point came forward which had not arisen in the court below. The defendants obtaining leave to adduce fresh evidence, cited a statutory charter of 1st Edward III. In that the king, with the consent of Parliament, conceded to the London citizens, among other rights and privileges, that no market within seven miles round about the City of London should be granted by the king or his heirs to any one. In 1682 Charles II. granted by charter to the plaintiffs' predecessors in title the right to hold a market in or about Spital-square, on Thursdays and Saturdays. In 1688 James II. granted to the then owner of that market and market franchise the right to hold the market on Mondays, Wednesdays, and Saturdays in lieu of Thursdays and Saturdays. The defendants urged that both the charter of King Charles II. and that of King James II. are void, as being in derogation of King Edward III.'s grant, for which latter they claimed the force of an Act of Parliament, further that if they are not void on that ground they have been destroyed by statute 2nd William and Mary (Bill of Rights), which voided grants made by the Crown, in violation of civic privileges, since a certain judgment of 683,—one year later, he it observed, than the

prior grant by King Charles II. The hearing of the appeal lasted over five days. In the result the Court held that there being evidence of user since 1723 at latest, and no evidence of dissent by the Corporation, they must be held to have consented to the grant of Charles II., and to have waived their rights under Edward III.'s charter,—which they were at liberty to do though it had the force of an Act of Parliament; but that James II.'s charter, being directly within the Act of William and Mary, was avoided; though the plaintiffs were not thereby prevented from relying upon their earlier rights. The Court also held that the plaintiffs' rights to hold their market in the streets about Spital-square were not affected by various Acts of King George III.'s reign,* inasmuch as those acts were merely for the prevention of certain nuisances and did not diminish existing rights. And further that though what the defendants did was not sufficient to constitute a market franchise, and no tolls were taken, yet the defendants had set up a rival place of sale, and provided a concourse of buyers and sellers sufficient to constitute a disturbance of the plaintiffs' market and to justify the action. So the appeal was dismissed, the effect being that the plaintiffs were declared to be entitled to hold markets on Thursday and Saturday for the goods named†; and the defendants restrained from so using their station as to interfere therewith. Mr. William Burdett-Coutts, in welcoming the Shore-ditch salesmen, said that, together with its developed traffic in fish, no efforts would be wanting on his or the Baroness's part to make Columbia Market the permanent home of the potato and other vegetable trade in East London.

Thus far concerning the lessees or owners of Spitalfields Market. Another proprietorship is called in question,—we mean that of the public,—by certain pending proposals apparently based upon the judgment of the Appeal Court, to appropriate the site and change the character of the street market here held. The site stands a short distance westwards of Christ Church, Spitalfields, being bounded by Lamb-street (north); Brushfield-street (late Union-street), here formerly Paternoster-row (south); Red Lion-street (east); and Crispin-street (west). King Charles II.'s letter of April 24, 1682, to the Sheriff of Middlesex, inquires whether prejudice would arise from the granting to John Balch, his heirs and assigns, of a market on Thursday and Saturday "in or next to a certain place called the Spittle-square in the parish of Stepney, otherwise Stebunheath." The reply sets forth that it will not be to the damage of the said Lord the King, &c., if the markets be held "in the place called the Spital-square." Now the Spital-square named in the letters patent following on this correspondence (29 July, 1682) is not the locality which is so named at this day; that is to say, the square, formerly known as Spital-yard, in Norton Folgate. Its portion of the ground, in the position we indicate, which was afterwards covered with houses for the accommodation of the French refugees who settled here on the revocation of the Edict of Nantes, 1685. These buildings, nevertheless, were once known as Spital-square, and would seem to have retained that designation until it was transferred, circa 1720, to the neighbouring Spital-yard.‡ On 22nd September, 1688, further letters patent issued to one George Bonn. These, after setting forth the original grant and reciting that Bonn was then seised of the market, market rights, and premises, substituted a market, to be held on Mondays and Wednesdays, for the previous Thursday market, ratifying the existing Saturday market. A patent of this later date, which touched the rights of the Corporation, would come within the purview of the Bill of Rights (1689) to which we advert above. So the continuance of the market to the present day goes to prove that the civic authorities did not, or could not, regard it as an encroachment upon their own rights and prerogative. At the same time we gather that the mart itself has never been other than a public street market of the kind

with which all wayfarers in the East End are familiar. No mention occurs of a market, or of any private market rights, in certain local Acts passed since Christ Church became a parish distinct from Stepney. On the other hand, record exists that the booth and stalls were occasionally removed during the past 150 years or so; and that on more than one occasion force was employed where buyers and dealers alike failed to keep the peace. The market-place has been recently covered with a glass roof, and the surrounding tenements are in course of re-erection.

Since famous for the not infrequently polemical "Spital Sermons," which were preached from the pulpit cross often mentioned by Foxe, the priory and hospital of "our blessed lady St. Mary" was originally founded (1197) in a locality then styled Lolesworth, by Walter Brune, sheriff, and Rosia his wife, for canons regulars of St. Augustine. Lolesworth had been a Roman burial-ground, and was, perhaps, used by the Saxons for a similar purpose. Stow gives an account of the coins, urns, bottles, unguent phials, &c., which came to light on the breaking up, circa 1576, of Spittle Fields, for clay wherewith to make bricks.* Passing to the Crown at the Dissolution, when this Domus Dei et Beatæ Mariæ contained as many as 180 aged and infirm almspeople, the hospital subsequently gave place to large town houses, once greatly in favour with ambassadors from foreign parts. At the north-eastern corner of Spital-square stood the pulpit cross, before which, in 1594, a gallery was erected for the governors and boys of Christ's Hospital.† It was destroyed during the troublous days that preceded the Commonwealth; whilst the sermons, though resumed at the Restoration, were transferred to St. Bride's, Fleet-street, and thence, having been reduced to two in number, to Christ Church, Newgate-street, at the end of last century. Held in great repute, the Spital sermons were always attended, like those at Paul's Cross, by the lord mayor and aldermen, who sat at the windows of a fair-built house, according to Newcourt, near the pulpit. Trollope, in his "History of Christ's Hospital," derives the civic festivities at Eastertide from the private dinners given by the lord mayor and sheriffs at the close of each day's solemnities to such of the aldermen as had taken part therein. Nor were higher personages absent. In April, 1559, Queen Elizabeth returned in high state from the Spital, attended by a thousand mailed men-at-arms and ten pieces, through London to the Court, with martial music, two morris-dancers, and two white bears in a cart. Bagford, in Leland's "Collectanea," describes the priory as then standing, being strongly built of timber, with a turret at each angle; north of the now square which covers the hospital yard the foundations were laid bare early in the eighteenth century. Little else connects the square with the past, though we may add that in one house lived Bollingbroke, the "St. John" of Pope. Culpepper, the herbalist, occupied a house then in the Fields, and subsequently a tavern at Red Lion-court corner. Lilly, the astrologer, announces his particular wares for sale in the "Faire at Spittlefields," whereof an account is contained in a rare pamphlet at the British Museum; and Paternoster-row, a turning southwards out of Brushfield-street, is, some would say, the locality of Tarleton's ordinary, rather than the row by St. Paul's. The old Mathematical Society, removing in 1735 from the Ben Jonson's Head, Pelham-street, had large apartments until 1845,—when they made over their books, records, and memorials to the Royal Astronomical Society,—in Crispin-street (see Weld's "History of the Royal Society"). It is curious to observe how slowly the growth of London extended in this direction for a long period. The Spital, or rather the houses which arose on its ruins, stands remote in a map of 1572; in Aggas's map, planned six years later, the Spittle Fields appear as a large space, open to the country, occupied by archers and by the cattle, of which Hughson writes as feeding here in 1670. And so, with but slight change in various maps, one or two of them being French maps, ranging from 1610 (Norden's) to 1725 (Bowles's) and 1726 (Hollar's by Oliver), whilst in Faithorne's map Clerkenwell, Shoreditch,

* 12 Geo. III. c. 39, 23 Geo. III. c. 60, and 57 Geo. III. c. 29, for regulating and paving the streets round Spital-square, and which forbade the placing of carts, &c., therein, except for the purposes of unloading and loading.

† H. Hen speaks (1709) of Spitalfields Market as one "fine for flesh, fowl, and roots."

‡ In maps of 1716 and 1721 the now market site is named "Spital Market" and "Spittlefields Market," respectively.

* Some stone coffins, also disinterred here, were deposited in the vault beneath Christ Church.

† For their first visit here the scholars adopted their blue coats and yellow stockings.

and Whitechapel form the north-eastern limits of the town. But though the Artillery Company's former artillery-ground (whence the street and lane of that name, with Gun and Fort streets), Bethnal-green, and Spitalfields remained as grass-land within the last 150 years, the influx of the Walloon and French "strangers," as our own artificers would call foreign workmen, created a new settlement about Spital-square. These increased so rapidly that St. Dunstan's, Stepney, could no longer meet their needs. In 1693 Sir George Wheeler, prebendary of Durham, built the chapel,—consecrated, 1842, as St. Mary's,—in Spital-square, close to the site of the Cross, whilst in 1728-9 was erected, at an initial cost, it is said, of 60,000*l.*, Christ Church, of stone, from a design by Hawksmoor.*

The annals of the Spitalfields weavers form an interesting chapter in the domestic history of London. Their antecedents may yet be recognised in the Anglicised surnames of a few master-hands; for instance, King (Le Roy), Young (Le Jeune), White (Le Blanc), Cooper (Tonnelier), and the like; whilst many existing families, including the Chabots, the Desormeaux, the Ouvrirs, Bouveries, Laboucheres, and the Turquands trace their descent from their first refugees of 1685. But the actual craftsmen are, for the most part, purely English in blood. Their houses are plainly distinguishable by the large windows on the upper floors. They are famous for their capture and training of British songsters,—larks, linnets, and finches. Their custom of singing whilst working at their looms, like to the Protestant woollen weavers from Flanders, is cited by Sir John Falstaff,—"I would I were a weaver; I could sing psalms or anything" ("King Henry IV.," first part, act ii., sc. 4); and Ben Jonson's Cutbeard says in reference to the Parson's rheum, "He got this cold with sitting up late, and singing catches with cloth-workers" ("The Silent Woman," act iii., sc. 2). The emigrants and their descendants have not wanted for eleemosynary advantages. The French Hospital and Dispensary, which was opened in 1867 at Leicester-place, Leicester-square, had been preceded by the Asylum in St. Luke's,† where four acres were bought from the Ironmongers' Company, 1716, with De Gastigny's endowment. De Gastigny was Master of the Buckhounds to William III. when Prince of Orange, at "The House in the Wood" in Holland. The Toulon merchants largely contributed to the support of the "Old French Protestant Hospital." By 1760 the Governors could provide additional room for nearly 240 in-patients. This institution was lately transferred to new premises in Victoria Park, Bethnal Green, planned by Mr. R. L. Roumieu, architect, himself a descendant of the Huguenot Roumieux of Languedoc. At the first performance of the Covent Garden pantomime for poor children two years ago there attended a school of girls, each of whom could claim an ancestor among the early Protestant refugees to England.

We should add that since this article was written, the Attorney-General, at the relation of the Whitechapel Board of Works, brought an action against the now lessee for confining the mart within certain limits. At the end of a four days' hearing, Mr. Justice Stephen gave judgment for the relators, and granted an injunction to restrain the defendant from putting vehicles, &c., in the four streets around the market-square on any day, and from so using the four inner approaches (North, South, East, and West streets) on other than market days. His lordship meanwhile suspended execution of the injunction, pending appeal by the defendant.

"Bartolozzi" Decoration.—Under this title Messrs. Morant & Co., of Bond-street, are utilising some plates of original ornamental designs by Bartolozzi, which they have acquired, by reproducing them as panel and pilaster ornaments, imitating, at the same time, the effect of Bartolozzi's stippled grounds. The designs do not differ materially from those of the Adams and their school; they make pretty drawing-room and boudoir decoration, and derive some additional interest from their connexion with the famous engraver's name.

* In this church, for which considerable sums have been spent since its consecration, is an early work of Flaxman, a whole-length figure of Sir Robert Ladbroke in his robes as Lord Mayor.

† This French Hospital stood in Pethhouse row, St. Luke's, opposite to Peers Pool, and north-west of the St. Luke's Hospital after its removal to the northern side of Old-street, near the Dig House Bar. The City Pest-house, opened here for sufferers from the plague, continued until 1757.

EXHIBITION OF ECCLESIASTICAL EMBROIDERY.

SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON.

THE present loan collection is in some ways a new departure from the exhibitions that have preceded it, this being entirely confined to embroidery for ecclesiastical purposes.

Various types of needlework are well displayed, and although it does not seem to have been possible to arrange the several pieces in classes,—an arrangement which would very much assist the student,—yet a little industry will enable the development of any type to be readily traced. Of the fine Italian work produced at the very end of the fifteenth and early part of the sixteenth centuries but few pieces are shown. This is to be regretted; for at that period *appliqué* work, combined with embroidery, of singularly noble design and the finest execution, was general,—soon, alas! to give place to a heavy and loaded treatment, quite out of character with needlework. An immense quantity of this work has of late years been brought from Italy and Spain into Paris and London. It consists almost entirely of ecclesiastical vestments, and we testify our respect and admiration by cutting out the "pretty pieces" and turning them into chair-backs, &c. No. 160, lent by the Duke of Westminster, is a notable example of fine embroidery of this period. It is a chasuble, of pale red velvet ground, embroidered in gold and silver. Some of the leaves show a few strokes of paint instead of needlework on them. This is now mounted as a screen, and loses much of its charm through being strained so tightly.

The South Kensington Museum lends several fine pieces of the same school.

The gradual decay of the art may be noted in several specimens exhibited, until we find ourselves before such absurdities as the set of panels, No. 180, representing events in the lives of various saints, who, with exquisite complexities painted on silk, are attitudinising in every direction; or the still more debased piece, No. 110, which is described as an altar-piece. It may perhaps have been a frontal, and is divided by twisted pillars, raised in half relief, and covered with coral and garnets, into five panels. It would not make, if translated into wood, a bad chest front. It suggests the coarse overladen style of Naples.

Hanging immediately above the last is a noble example of embroidery, No. 172, now the sanctuary carpet at St. George's (R. O.) Cathedral, Southwark. The way in which the Italian was influenced by the embroiderers of Persia is in this piece very clearly to be traced. Another example of this class of work, in which the ground as well as the decoration in needlework is to be seen, is a chasuble, No. 148. The design of this piece does not owe anything to the East, but the workmanship,—a long stitch sewn down,—shows how sumptuous an effect may be obtained by a very simple treatment of the material.

No. 173 is an example of a totally different treatment of silk, namely, in "cushion stitch." It is described as Sicilian, which we should beg leave to doubt. The type of work is more properly Venetian. Another specimen of the same type is No. 9, curtains of a sanctuary from a synagogue. This shows marked Eastern influence in the simplicity of its treatment and the absence of any efforts at direct imitation.

An interesting collection of work is contributed from the synagogues in the form of mantles for the scrolls of the Law. Most of these are too modern to be worthy of much attention, but some pieces of Portuguese origin are very sumptuous, although not pure specimens of embroidery. The City Companies' palls are in great force; and although they have been from time to time exhibited elsewhere, there are no pieces exhibited which better deserve the closest study.

Amongst the ecclesiastical vestments, Nos. 72, 73, 74a, and 80, lent by the Bishop of Southwark, are deserving of regard. They are much made up; in some instances cruelly "restored" and decorated,—"save the mark!"—with the most tawdry lace, but are of extreme value. No. 94 is one of the earliest Medieval pieces in the collection, and has gone through great vicissitudes, having begun its existence as a cope, and survived as pulpit-hangings. Of this class, No. 98, lent by Mr. A. W. Franks, is perhaps the gem of the collection. It is a fine piece of English embroidery, date,—according to the catalogue,—

1300. On it is MCCCXC. ROMA; but the style shows it to be earlier than the end of the fourteenth century. A short time since photographs of a cope preserved in the Cathedral of Pienza were exhibited at the Society of Antiquaries. This vestment is in perfect preservation, is undoubtedly English, and is a proof, if such were needed, of the esteem in which works of English embroidery were held in Italy. The piece lent by Mr. Franks is, in style, stitch, and design, identical with this cope, and, doubtless, was made at the same place. There are numerous pieces exhibited deserving of close attention; but space will not permit us to describe them.

FIXTURES.

It is an unfortunate feature in a system of law if important terms have a doubtful meaning, and it must be admitted that in English law the word "fixtures" will be found to be used in quite opposite significations. This is to be regretted, because it is a term which is of everyday use and of practical importance in the lives, some time or other, of most people, and as long as there is uncertainty as to the legal meaning of the term, to a certain extent there must also be the uncertainty which exists in the minds of many as to what are comprised within the term "fixtures." In the third edition of Amos and Ferrard on "Fixtures,"* which is very welcome, since the second edition was published so long ago as 1847, and which is a most useful and necessary work for any one who has from time to time to consider the subject, the conflict between the opposite meanings of the word "fixture" will be very clearly seen.

Primarily the ordinary reader would suppose that the word meant things which were fixed to the ground so as to be, so to speak, a part of it, and thus to become the property of the owner of the place, and to be incapable of removal when there is any question as to the legal right of the person who places them on the ground or building and the person to whom the ground or building belongs. This, indeed, is one of the ways in which the term has been legally employed, being "applied to things expressly to denote that they cannot legally be removed, as where they have been annexed to a house, and the party who has affixed them is not at liberty afterwards to sever and take them away." On the other hand, the word has received this very opposite definition, "personal chattels, which have been annexed to land so as to become part of it, but which may be afterwards severed and removed by the person who has annexed them, or his personal representative, against the will of the owner of the freehold." So that, in truth, it is impossible to use this very short and convenient word in either sense without the risk of confusion, and it is therefore safer to consider the word as being applicable to a class of things placed on the ground or on buildings, but not to apply it in connexion with removability or irremovability. It is unfortunate that there is this necessity, but if persons use the word in one sense or the other, it is quite certain that from time to time they will get into difficulties by so doing. It is probable that, to a certain extent, the trouble has arisen by the force of circumstances. By the common law of England everything affixed to the freehold became an essential part of it, and thus necessarily became the property of the freeholder. Consequently fixtures in early times would be regarded in the first sense of the term. But subsequently, when the rule became gradually relaxed, in process of time the class of removable articles greatly increased; and they were termed fixtures to distinguish them from the articles then properly so called. It will, however, probably be of greater practical use if, having pointed out the essential difficulty connected with this subject, we culled from the pages of the work on "Fixtures" to which we have alluded some examples of articles which are removable, and point out some of the signs by which their removability is ascertained.

The first instances which may be taken are statues, vases, &c., connected with a house or with its grounds; and the test whether these are or are not removable seems to depend upon the criterion whether they are strictly a part of the architectural design of the place, and also whether they are in the nature

* Amos and Ferrard on the Law of Fixtures. Third Edition. By C. A. Ferrard and W. H. Roberts, Barristers-at-Law. London: Stevens & Sons, 1884.

of permanent fixtures. In a case before the late Lord Romilly it was decided that some carved kneeling figures in the staircase in the great hall of an exceptionally large and handsome country-house, and some lions at the head of a flight of steps into the garden, as well as some stone garden-seats, could not be removed. "I think," said the judge, "it does not depend on whether any cement is used for fixing these articles, or whether they rest by their own weight, but upon this,—whether they are strictly and properly part of the architectural design for the hall and staircase itself, and put in there as such, as distinguished from mere ornaments to be afterwards added." This is, no doubt, as admitted by the judge himself, a fine distinction, but still it does act as a test, and is probably as useful as one as can be found. We have in the above definition added to it by coupling with it the question of permanence, and it is probable that this would sometimes be necessary, for it is quite possible to imagine things part of the architectural design of the house, but which had so little of the character of permanence about them that it would be difficult to consider them to be immovable. As a sequel to this case we may mention a Scotch one in which it was decided that stone lions in the ground of a house, and bedded in place, and freely vases, placed on the tops of a stone parapet wall and on stone pedestals, and attached by cement, did not lose their character as removable articles, since they formed no part of the design of the house, and the cement was only required for the purpose of preventing them from being blown or knocked over.

There are various classes of fixtures, such as those connected with agriculture and trade, which are of considerable importance, but which space will not now allow us to notice. Such as are connected with ordinary dwelling-houses may be considered of wider importance, and on them we may say something. It must be confessed that the distinction between things removable by a tenant and those which become the property of the landlord is a difficult one. Removable fixtures are thus classed in *Amos and Ferrard* on "The Law of Fixtures." Hangings, tapestry, and pier-glasses nailed or screwed to the walls or panels of a house, ornamental chimney-pieces, whether of marble or other material, wooden cornices, marble slabs, window-blinds, and the like, and even, it has been said, wainscot, fixed to the wall by screws. In addition to those which are here enumerated, there are other things, such as cupboards and shelves, grates, bells, &c. But the difficulty in regard to these, primarily, as the law now stands, removable things, is increased by the fact that this power of removal by the tenant is not an absolute one, because, to use the words of Chief Justice Dallas, "there may be that sort of fixing or annexation which, though the building or thing may have been solely for ornament, will yet make the removal of it waste."

But considering that chimney-pieces have been more than once included in the class of removable fixtures, it is difficult to see where the exact line is to be drawn, because there are probably few, if any, fixtures in a house which can be said to be more permanent or more integral parts of a house than the chimney-pieces; of course if chimney-pieces were to be removable, then grates could hardly be excluded. And arguing on from article to article, it would seem very difficult to say that a ventilating pipe, for example, should not be just as much removed as a grate. Again, if a grate can be removed, why should not a conservatory on brick foundations be equally taken away by a tenant? But, on the contrary, it has twice been decided that conservatories on brick foundations become, at any rate, the property of the landlord. The arbitrary character of the distinction, or want of distinction, between different articles was clearly shown in the judgment of Chief Justice Dallas in regard to the first conservatory case; for, after alluding to the chimney-pieces and other matters, he said:—"Of all these it is to be observed that they are exceptions only, and therefore, though to be fairly considered, not to be extended." But the reasoning which would allow the tenant to remove one would allow him to remove the other, so that it may fairly be said that the exceptions and the rules now are based on no particular principle. Under the old law of England all these fixtures would, on being placed in a house, have ceased to be the pro-

perty of the tenant. It has been simply by what may be called judicial legislation, based now on the idea of a fixture being ornamental, and now that it was only lightly annexed to the house, that a large class of exceptions has sprung up, which, comprising most things that a tenant would desire to remove, has now been practically fixed, and will, apparently, not be extended. But, whilst habit has got the world to know, more or less, certain of the common fixtures which may be removed from time to time when disputes arise, the great difficulty of deciding what are and what are not to be removed by a tenant is shown. The three criteria,—namely, the method of annexation, the nature and construction of the fixture, and the effect of the removal on the property of the reversioner,—may help us to decide on the points as they arise. But, with exceptions to the old common-law rule so numerous, based on grounds so arbitrary, it is impossible that, except by direct legislation, the question of what are removable fixtures can ever be one either easy or satisfactory to decide.

THE CARPENTERS AND FLOOR-MAKERS OF PARIS.

THE union of the master carpenters of Paris has given evidence to the Commission of the Forty-four. M. Bertrand, the president of the Syndical Chamber of the employers of this trade, was the spokesman. He stated that there were in all 282 employers in Paris, and that, out of this number, 121 had joined the Masters' Union. The condition of the working men had, he maintained, greatly improved. They now required luxuries unknown some years ago, and still ignored in foreign countries. This naturally affected the question of wages, and M. Bertrand did not hesitate to say that the present depression was, in fact, due to the increase of salaries. In Germany the carpenter only makes 2s. per day, while the Parisian receives at least 6s. 5d. The employers were therefore compelled to send abroad for workmen. The number of men required in the trade had, however, been greatly exaggerated. There were formerly 5,000 journeymen carpenters in Paris, but these had now been reduced to about 3,500, and each year during the winter 700 to 800 return to the provinces. The men work ten hours during the summer, and eight in the winter, and, as a rule, receive 8d. per hour. The town of Paris pays, however, 9d., and against this liberality M. Bertrand protested. The employers meant to resist by every means the example set by the municipality, and he attempted to show that it was in the interest of the workmen themselves to receive 1d. less per hour. He further reckoned that only seven-tenths of the workmen in this branch were employed; nor would he hold forth any hope of a revival in the trade. It was, on the contrary, his opinion that, fifteen months hence, the crisis would be far more acute.

The scheme for building cheap artisans' dwellings was treated by M. Bertrand as a Utopian idea; and he urged that on the outskirts of Paris there was a plentiful supply of cheap lodgings available for workmen. The best way of attenuating the crisis would be to improve the means of communication so that the poorer sections of the population might dwell in the more distant and cheaper districts. Finally, we are informed that the employers have created an insurance fund in favour of the workmen. This is done by the employers independently, and without the assistance of the workmen.

To the above statements, the workmen object that the proportion of men without employ is greater than that mentioned by M. Bertrand. They also urge that, though the workman does receive 8 fr., still he is rarely able to work more than 245 days in the year, and this therefore reduces his income to 4s. 3½d. per day. Considering the high price of provisions and the exorbitant charge for rent, this is not sufficient for a man and his family to live on in Paris; and they therefore insist that the tariff of the town should be adopted throughout the trade, and the wages raised to 9d. per hour. The delegates of the carpenters' society, entitled "Le Devoir," 161, Rue d'Allemagne, protested that the workmen themselves had created a benefit fund and made every effort to assist each other in times of depression, accident, and sickness. The introduction of machinery, the disturbing effect of the expeditions to Tunis and Tonquin, were

mentioned by the men as among the causes of the present depression. To remedy the evil they suggested that contracts for work should be made with the workmen's societies without the intervention of a middle-man. The workmen were well enough organised to carry out any branch of carpentering, and the State could well do without the employers, who kept for themselves the larger share of the profits and rendered no equivalent service.

The delegates from the union of the workmen who inlay the floors were also examined by the Parliamentary Commission. This branch of the building trade is, comparatively speaking, of greater importance in Paris than in London. The polished floors of French houses naturally require more care than the plain boards of our English homes. The fact that in France, as a rule, carpets are only used in winter, explains this difference. It is estimated that there are about 1,200 parquetry workers in Paris, of whom only half are now employed. Their wages amount to 7l. 4s. per month, and they attribute the present crisis to the competition between builders, to the fact that too many high-class houses have been constructed. The result is not only that these houses in many instances have no tenants, but the financial position of the builders is often gravely compromised, for many among them are part proprietors of the property they help to create. The delegates complained very bitterly of the fact that the parquetry work was often conceded to the contractor who undertook the joinery. This individual has consequently to engage a sub-contractor for the inlaying of the floors, and this meant a subdivision of the profits, the reduction of wages, and often the employment of unskilled, incompetent workmen. The delegates then complained that they had frequently sought to establish friendly relations with the masters' association, but had not yet been successful. On their side, the workmen's union only consisted of 350 members, and half the members failed to pay their subscriptions regularly. Thereupon, the president of the Parliamentary Commission delivered a little speech to the delegates, urging them to cultivate all means of improving their technical education. This, he argued, was the best means of raising French industry, and of resisting foreign competition.

MR. POYNTER, R.A., ON THE CONNEXION BETWEEN ASIATIC AND GREEK SCULPTURE.*

ANOTHER link connecting Greek with Assyrian art is the constant introduction of the lion into Greek architectural decoration. The lion could hardly have been indigenous to Greek soil, and must therefore have been introduced from abroad; and while the lion of Greek sculpture has no affinity with the Egyptian lion, the resemblance to Assyrian treatment is very marked, even to my mind in the lions' heads from the cornice of the Parthenon, but the Greek lion is never so true to nature and to the character of the beast as the Assyrian. To the copious evidence from the vases I cannot do more than allude, but must refer you to the early vases from Rhodes and elsewhere in the British Museum, decorated with animals in the Assyrian style, and with the Assyrian guilloche ornament.

Any such direct influence from Egypt it is difficult to trace. In those very early and prehistoric remains at Mycenæ and Orchomenos, and other places in Greece proper, a spiral ornament has been found in abundance, which resembles a similar decorative form in a tomb at Thebes, but the connexion seems too remote to have much value as evidence, and the form might equally well have come from Asia; for the imposing decoration of the Lion Gate at Mycenæ, which is probably well known to you as the earliest known specimen of Greek sculpture, is distinctly Asiatic; similar arrangements of two lions facing each other in the position called "rampant" in heraldry, on each side of a central column, having been found in Phrygia, over the doors of more than one tomb, the disposition being originally Assyrian. The columns of the Treasury of Atreus at the same place have a large spreading base, something like the Egyptian, but there the resemblance ends; the

* Continuation of a lecture delivered at the Royal Academy on the 10th inst. (see p. 401, ante). For Mr. Poynter's previous lecture (on Egyptian Sculpture) see *Builder*, pp. 330, 368, ante.

general form and decoration are like nothing else that we know. More connected with historical times, but still rather of a traditional than of an historical nature, is the account of the brothers Theodorus and Telecles of Samos, the reputed inventors of casting in bronze, who are said to have lived some time in Egypt, probably in the seventh century B.C., and to have made an Apollo in the Egyptian style. The story runs that they learned the Egyptian art of sculpture with such exactitude that Theodorus, having made one half in Ephesus, and Telecles the other half in Samos, when the two halves were brought together they agreed as perfectly as though the whole had been done by one artist. The figure was of wood, and must, of course, have been of a very uncouth character. Mr. Murray connects with it a very primitive statue of Apollo, which is at Munich, called the Apollo of Tenes, which he supposes may be a copy of this wooden statue. Two repetitions, one of which is called the Strangford Apollo, are in the British Museum; and there is another, called the Apollo of Thera, at Athens. There is no doubt that they are all repetitions of some celebrated though highly primitive original. There is unquestionably a certain Egyptian character in these figures. The hands straight down by the sides, the position of the feet, the wig-like treatment of the hair, and the small waist, with the peculiar treatment of the thorax, in the Munich Apollo, are all such as we have found in Egyptian figures. But we find also in this early copy of an ancient figure an independent effort towards the realisation of natural forms; the knees are studied from nature, and show an original and individual, if not very successful, attempt on the part of the artist, to give the fold of skin under the patella; and the details throughout the figure show the same spirit. The face has the marked Asiatic type, with eyes sloping upwards towards the temples, which we find in all the earliest Greek art, and which is also conspicuous in the Cyprian sculptures which I have described. The Apollo of the British Museum is later, and shows some differences of treatment, into which I need not enter. There are casts of these statues in the Museum of Casts at South Kensington. Some small works in bronze, supposed to be of Peloponnesian art, also present some peculiarities which may be said to be Egyptian. And here, I think, is all the evidence of Egyptian influence which can be shown. How it was that the Greeks came to lay so much stress on this origin of their arts, and of so many of their manners and customs, and indeed of their religious rites, and to ignore the much more important and lasting influence of the Eastern nations of Asia, does not seem difficult to understand. The Persians and the other Oriental conquering despots were their natural enemies; Greek settlements in Asia Minor and the islands were constantly being devastated by Assyrian and Persian conquerors. Direct intercourse with countries with whom they were perpetually at war was not possible, and it was mostly by the intermediary traffic of the Phœnicians that the arts of these countries were gradually and imperceptibly influencing their own. The Egyptians, on the other hand, were allied with them in resisting the advances of these powerful despots; the kings of the twenty-sixth dynasty only succeeded in delivering their country from Assyrian occupation by the assistance of Greek mercenaries; and Greece, as we know, was equally interested with Egypt in repelling the great Persian invasions. Their intercourse with Egypt, which after the Persian war, was frequent, would naturally lead them to think more of the assistance in the development of their art which they could trace to that country, than of the gradual advance which came in unperceived from other quarters. It is interesting to trace the duration of these influences on the workmanship of Greek art. I have shown you the peculiar treatment of the hair in the sculptures from Cyprus. Examination of works of Greek sculpture in the Museum of Casts at South Kensington, where a chronological arrangement gives the opportunity for comparison, shows that this particular method of arranging the hair in regular locks terminating with a curl, or in distinct spirals, or in close and conventionally-formed curls treated in the same formal manner, was continued even to the time of Pheidias; for we find it adopted by Alcamenes (whose work is stiffer and retains more of the archaic treatment than that of some of his contemporaries) in the pediment sculptures of

the Temple of Zeus at Olympia. The locks are less formal in arrangement, it is true, but the defined curl at the end is there as distinctly as in the earlier works. In the stele of the warrior Aristion, by Aristocles, at Athens, we have a figure of the end of the sixth or very early in the fifth century. Here the general character is so like that of the soldiers in the Assyrian bas-reliefs as to be quite startling. The exaggerated muscularity of the limbs, the eye placed in full view in a face which is in profile, the arrangement of the hair, and even the attitude, are almost identical. Much of this must be accidental, for we can imagine no direct influence which would be possible at that date; but some of it, no doubt, is traditional, handed down from earlier methods of treatment when Oriental and Asiatic sources were in more direct contact with Greek life. We find a like arrangement of the curls in those of the warriors of the Æginetan sculptures, who are without helmets; and there are other instances of similar treatment with which I need not trouble you, but which, when the Museum of Casts is open to the public, you will be able to trace for yourselves. It may be that through this method of rendering the hair is to be traced the Ionic influence from western Asia Minor on the art of Greece proper.

We have still another country in Asia in which sculptured monuments have been found, closely related to Greek art, whose remains are in the British Museum. I refer to the Lycian tombs and their highly interesting reliefs. This subject is one which Mr. Newton has made peculiarly his own, and I shall do no more than allude to it. The place of Lycian art seems to be not definitely settled. The early sculptures, which are those I am now dealing with, are considered to show Persian influence, and Mr. Murray gives in his History an illustration of some horses from a funeral procession in the British Museum, the tracings of which are identical with those found on the reliefs at Persepolis. If these sculptures were executed after the conquest of Xanthos by Harpagus, the Persian general, in B.C. 564, which, from their style, may be said to be certain, this resemblance is easily accounted for. Mr. Murray supposes their date to be from 540 to 500 B.C. But the general character of these, and of the reliefs on the well-known Harpy tomb, are in their workmanship what we should call Greek, although the mythical beings represented are of Lycian origin. The costumes, too, are such as we find in the Ionian Greek art,—the long Ionian tunic, of fine material, in multitudinous folds, being conspicuous. Lycia was in no sense a Greek colony, and it had a distinct and separate language of its own, but it seems difficult to doubt the sculptures being of Greek workmanship. Otherwise we must suppose an independent school existing there, from which the Greeks must have learned much more directly than is easily imagined. I do not think that any such supposition can be entertained.

Closely resembling these marbles in style and in costume are those bas-reliefs found in Thasos, the most northerly of the islands in the Ægean Sea. These are far superior in execution to the Lycian reliefs, and somewhat more advanced in treatment. A figure of Apollo with the lyre, instead of being in exact profile, like all the other figures, and like those of the Lycian reliefs, is turned round, so as to give a three-quarter view of the body, and the face was probably in full front view. The attitude, though stiff, is approaching the freedom of the Parthenon frieze, and the drapery is natural in treatment throughout, though still retaining some archaic stiffness in the execution. These reliefs, which are in the Louvre, are considered by a French critic to be of the second quarter of the fifth century B.C., which would make them from fifty to sixty years later than the Lycian monuments, which seems hardly possible, and I can hardly consent to give to these archaic works a place so advanced in the history of art. However this may be, and it is not for us a matter of great importance, we find in these reliefs more independence of style than in any works that I have hitherto referred to. The head-dresses and hair are no longer rendered on stereotyped models, but are taken direct from nature, the head-dresses being of the beautiful kind which we associate with purely Greek personages, and, no doubt, exact copies of what was worn. In the Lycian reliefs the diadems are carved in stone; in those from Thasos they were in metal, probably bronze-gilt. The holes for fixing them are there, but the metal has, of

course, disappeared. The beautiful Ionic dresses are rendered also with great fidelity to actual costume, and so varied are they that one could almost suppose that the artist had the intention of showing us the different materials and methods of arranging the tunics and upper garments.

It is with reference to the extraneous influences brought to bear on Greek art that I have introduced the consideration of these sculptures, which otherwise would not find a place in treating of the early times I have hitherto been dealing with. In resuming the consideration of these we are struck with the difference of character between the Doric and the Ionic styles, which may be said to have the same relation to each other as the severe and sleeveless Doric tunic had to the long and graceful garment of the Ionians, and which is still further typified by the contrast between the two orders of architecture which bear their names; the one sturdy and massive in its proportions and severe in detail, the other slender and more profuse in its ornamentation. Accordingly we find the metopes from the temple at Selinus, a Doric colony in Sicily, differing widely from the statues at Branchidæ, though both are of about the same date,—the end of the seventh century B.C. But earlier than these, it is supposed, are the reliefs from Assos in the Troad, perhaps in some respects the most primitive Greek sculptures which exist. In these, which represent Greek myths in a comically grotesque form, Oriental influence is very obvious in the animals, in the type of face, and in the thin, flat character of the relief, and there is no more composition than in the Assyrian sculptures. They decorate the architrave of the Doric temple,—a solitary instance of sculpture found in this relation, and supposed to be suggested by the enriched metal casings with which it was the custom to cover wooden beams, and of which you may see most interesting and well-preserved Assyrian examples in the British Museum, in the long bronze friezes which overlaid the gates of Shalmaneser II. But also it must be said that the movements are more lively than in many works which are considered to be of later date. The feet, which in early art are always placed flat on the ground in walking, here have the heels raised. Moreover, a figure of Hercules, perfectly nude, shows as complete emancipation from the Oriental idea as the Selinus metopes. At Selinus the style of art is very different; the relief is very bold and high, and the figures stunted, with thick limbs and the large, prominent thighs, characteristic of the earliest Greek art, which we find also in the statues of Apollo, to which I have referred, but in them accompanied by great slenderness of the legs and ankles. The general appearance of the metopes from Selinus, which are probably familiar to you from casts which are in the British Museum, is grotesque in the extreme, and it is hard not to believe that the artist intended them to be humorous; but whereas at Assos there is not any attempt at composition, the figures being of all sizes,—some very large in proportion to the space, and others minute,—in these metopes we see perhaps the earliest attempt at that ordination and perfect arrangement for filling the space without forcing the disposition of the forms, which is one of the most distinguished characteristics of Greek art, at its best. In the statues from the Ionic settlement at Branchidæ there is hardly more, perhaps less, knowledge of the human form displayed than in the Sicilian metopes; but although the execution is clumsy, there is no ruggedness; on the contrary, the tendency is everywhere towards grace and softness, and rounded forms. This broad distinction between severity and softness, between sturdiness and grace, may be traced in the Doric and Ionic styles down to a late period. Those six splendid bronze draped figures in the museum at Naples, which, with other beautiful bronze originals, seem to be so unaccountably neglected in those histories of the art which are founded on German speculations, are believed by M. Bayet to be of the Peloponnesian school of the fourth century, and their simple attitudes and the severe lines of their Doric dresses are unquestionably in marked contrast to the Attic figures of the same period. The Giustiniani Vesta is a marble figure of precisely the same character; so like that it might be a marble copy of a similar figure by the same sculptor, but it is, I believe, considered to be earlier. At all events, this figure has excited much specu-

lation among archaeologists, whereas the bronze figures pass unnoticed.

It will be useless to carry further the consideration of a number of statues and reliefs which, if they are unknown to you, can convey no impression to your minds without illustrations. It will be still more useless to give you strings of names of sculptors with whom no discovered works are connected; and there are so many histories of sculpture now published that such an enumeration would be superfluous; among them I may mention Mr. Murray's "History," in 2 vols., to which I have often made reference in this lecture; Mrs. Mitchell's "History of Ancient Sculpture"; and Mr. Walter Perry's "History." All these have been published within the last three years, so that you have plenty of material for study carried up to the latest discoveries.

I have here endeavoured to sum up in a short account the evidences of whatever influences from outside assisted in determining the form which Greek art took to itself, and I believe it to be in general agreement with the opinions which are now held. It is clear that there is ample room for speculation in the absence of historical evidence on the one hand, and in the infinite variety and amount of circumstantial evidence on the other. If there is one thing which forces itself upon us more than another in looking at the earliest form which Greek art displays, it is that the feeling for beauty is conspicuous by its absence. It is clear that from Assyrian art they could have gained no feeling of this kind, and of that solemn and reposeful ideal of form with which, as we have seen, the Egyptians invested their monumental sculpture, we discover no trace. What we notice about the beginnings of Greek art is its independence; even while it borrows its ornamental forms and its style of workmanship from Oriental sources, it is applying them to its own ideas and giving them its own character. This independence is the secret of Greek superiority. In Egypt and in Assyria, as we have seen, all monumental art is more or less subservient to the one intention of recording the acts of the reigning monarch. In Assyria this is the unique idea; the gods themselves hold little place in their representations, and then, apparently, more as protectors of the king than as ideal beings influencing the fortunes of mankind in general; we see nothing but one central figure, an oppressive and all-powerful monarch, and a nation of slaves. Domestic life there is none; there are no tombs to record even the names of private persons, and it seems to be a mystery how they disposed of their dead. Under this monstrous oppression the individual is equally effaced in life and in death. In Egypt also we have a despotism, but of a more mild and beneficent kind, leaving the people free to cultivate the arts of peace and to enjoy domestic happiness; the family and reverence for the dead held a high place in their life, and were a fruitful source of production in painting and sculpture. The gods of Egypt, too, take an important position in their art. The Egyptians were a religious race; but the religion is priest-ridden, a religion of ritual and formulas. In Greece there was neither priest nor king to interfere with individual rights, nor to require flattery from literature or art; but there was an intensely religious sentiment, and awe of the gods held the first place in their lives. It is impossible to read Herodotus without being struck by this devotional feeling, which induces him to speak of the gods as it were with bated breath, to reverence the rites even of alien religions. Their historical myths are also religious myths; and, accordingly, from the very earliest times we find the gods and the myths taking the leading place in their art; and it is from the ideal of perfection with which their poetical imagination invested, each in his kind, the persons of their gods and heroes, that the inspiration of beauty is derived. But this comes only gradually. There is a period of more than a century and a half from the sculptures of Selinus, which, as the colony was founded in B.C. 615, may be said to be of about the year 600, to the building of the Parthenon about the year 445; and during all this time the seeking for beauty in nature and its expression in art does not appear to have been the aim of the Greek sculptor, though all his instincts tended towards it.

The approaches towards beauty in Greek art are of all its aspects perhaps the most interesting to trace, and could easily be made the subject of a lecture. It is obvious that there is no

time to deal with it. Briefly it may be said that the beauty is inherent in the archaism; the first effort of the Greeks was to render generally the impression of the human figure without going into details; the generic forms only are given, and those in a stiff and formal manner. By degrees, as the art improved, the execution became better, and forms became more rounded and more symmetrical, while still retaining their typical character. The aim of the artist was not, as I have said, so much towards a seeking for beauty in nature, as towards improvement in the execution of his work; it is during his progress in this respect that he begins to look for variety from nature arising from differences of character, and from the play of form in movement. It is the culmination of these two qualities, perfection of execution, and a perfect knowledge of nature, added, of course, to the high ideal conception of his subject, that makes the complete art of Pheidias.

This lecture has been but a sketch, or a collection of sketches, from a subject so vast that it has taken many a man's life-time to consider it in all its bearings. I am fully sensible of my own incompetence to deal with such a subject, and, as I told you at the beginning, it is only with the crumbs gathered from the labours of other men that I am able to approach you at all. I have referred you, as far as possible, to works which are accessible, and my object has been to make clear to you points which have interested and puzzled myself. I can only hope that the interest which I have taken in attempting to make them intelligible to myself may have in some way been imparted to what I have said.

THE ENFRANCHISEMENT OF LEASEHOLDS.

THE debate last week on Mr. Broadhurst's Bill for the Enfranchisement of Leaseholds, to which we briefly alluded at the time, must be regarded as one of a rather noteworthy character, especially coupled with the several Parliamentary notices which have since been given on this subject. That a Bill which must have offended the opinions of many persons, both Whigs and Tories, should, the first time it was debated in the House of Commons, have 104 supporters, shows conclusively that the principle, in a more or less modified form, will sooner or later be accepted by the Legislature. The chief secret of the success of Mr. Broadhurst must, we think, be sought for in the fact that his measure attempted to put an end to the system of leases for lives, and it was largely in order to crush this system that many voted for the Bill who were by no means prepared to agree to all its provisions. The inconvenience and the uncertainty of the system of leases for lives was conclusively shown during the debate. What, for instance, can be more absurd than that a man's tenure of his house should depend on the length of the lives of the Prince of Wales and the Duke of Connaught, and that when the latter went to Egypt the premium for renewing leases held on his life went up twenty-five per cent.? But in order to put an end to this system, the whole of Mr. Broadhurst's Bill need not become law. It might be possible to pass a short Act making it illegal to grant leases for lives after a certain period, and to change existing leases for lives into leases for fixed periods on certain terms. Such a measure would probably become law in a short time, but mixed with Mr. Broadhurst's other proposals, it is unlikely to succeed in passing through the Legislature. But nothing in the debate has altered the opinion which we have before expressed that it is possible to limit the operation of the Act to leases for longer periods than twenty-one years. As we have before said, if the man with a lease to run for twenty-five years is allowed to buy out his landlord, is it in human nature that the man with fifteen years of his lease to run will not also wish to have the same right to exercise if he should desire it? Another noticeable incident during the debate was the assertion by many members that freedom of contract did not exist in large towns between landlord and tenant. Of course, on the other hand, this was denied; but the idea to be gained from the discussion certainly was that it is, nevertheless, the prevailing belief that tenants whose business obliges them to live in large towns must in practice submit to the landlord's

terms; that they cannot, in fact, deal with houses as they can with butchers' meat or tailors' clothes, and take them or leave them as they see fit,—that, in fact, freedom of contract does not exist. This is a noticeable point, because, if this fact is once admitted it obviously is ground for considerable legislative interference between urban landlords and tenants. It is also, indeed, a stronger ground for granting compensation to tenants for improvements than it is for giving the tenant the right to buy out his own landlord. The question of compensation for improvements did, indeed, crop up a little in the course of the debate, as when Sir Henry Drummond Wolff pointed out that tenants could not now be expected to spend money on permanent improvements. We take it that the recent debate will result in the speedy extinction of leases for lives, that it will create a public opinion on the relationship of landlord and tenant, especially in towns, which will probably end in ultimately improving the position of the tenant by placing on the landlord greater burdens and giving the tenant the right to be compensated for improvements. Further, the effect of the more general discussion of this matter,—especially in connexion with the gradual working of Lord Cairns's Act,—will be to cause large properties in towns to be gradually broken up. The Duke of Devonshire at Eastbourne is, for example, giving tenants the opportunities of purchasing the freehold of their estates. Large estates in towns give no social prominence, and, year by year, less social influence. Thus, under the effect of public opinion, public burdens, and Lord Cairns's Act, the object of Mr. Broadhurst's Bill will be gradually attained.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE ANNUAL DINNER.

THE sixth annual dinner in connexion with this institution took place on Tuesday evening last in the Venetian Saloon of the Holborn Restaurant, when nearly two hundred of the subscribers and their friends attended to support the president, Mr. Joseph Randall, of the firm of Kirk & Randall.

The Chairman, in proposing "Prosperity to the Institution," made an able appeal on behalf of the charity, observing that it was founded some seventeen years ago for the purpose of helping decayed builders' clerks who have arrived at the age of fifty-five, and their widows,—the sum of 25*l.* per annum being given to the male pensioners and 20*l.* per annum to the widows. Since the institution was founded nineteen pensioners had been elected, of whom twelve were now on the books. But useful as had been the work accomplished, much more might be done by the co-operation of the large body of builders' clerks. Comparatively few clerks supported the institution as annual subscribers, or its income, instead of being reckoned by hundreds, would be counted in the thousands. It could not be pretended that the granting of twelve small pensions and the maintenance of two orphans was an adequate expression of the needs of builders' clerks in these respects, but the institution could do no more unless it were better supported by the clerks themselves.

Other toasts followed, and during the evening subscriptions and donations to the amount of 40*l.* 8*s.* 6*d.* were announced,—a larger sum than has been obtained on any previous occasion. Among the gentlemen who supported the chairman and took part in the proceedings were Mr. Edward Conder, Mr. Thomas Stirling, Mr. Thomas F. Rider, Mr. Howard Collis, Mr. Stanley George Bird, Mr. Edwin Brooks (treasurer), Mr. Woodward, Mr. Stonor, Mr. Waller, Mr. Kenish, Mr. Kirk, Mr. Roe, Mr. Maton, Mr. Ross, Mr. Ward, and Mr. H. J. Wheatley, secretary.

Mr. Gullick's Mirror Painting.—Mr. Gullick writes to say that we have misrepresented his work in a "Note" in last week's *Builder* (page 398), in describing his large piece of mirror-painting as a piece to go behind a buffet, and therefore our strictures on painting a realistic representation of fruit in that position are uncalled for. He has also written at some length his views as to painting and decoration, claiming that his mirror-paintings are to be judged as pictures, not as decoration. We should have been very willing to print his letter, though not agreeing with it, but we have not space. As to the two points complained of, Mr. Gullick called it, in his own circular, "decoration for a dining-room," and most people, regarding it in that light, would naturally conclude it was to go behind the buffet; nor do we see where else it could go very well.

AMERICAN CONSTRUCTIVE DETAILS.
II.

The sheet of details we give this week shows some of the roofing details of the Custom House and Post-office, St. Louis, the section of the iron cupola of which we gave last week. It formed one of the illustrations to the paper read by Mr. Gale at the Civil and Mechanical Engineers' Society, and partially reported in our last (page 421, *ante*). The diagrams give sections showing the main points of construction in a method of roofing which aims at being fire-proof, which, at all events, excludes all combustible materials, dealing only with iron, slate, copper (for flashings), and concrete or cement. The building from which this and last week's illustrations were taken was erected under the supervision of Mr. J. G. Hill, supervising architect in the Treasury Department, U.S., and the illustrations are reproduced here from photographs of the original working drawings, communicated by him to Mr. Gale.

THE NEW SCOTTISH NATIONAL CHURCH
FOR LONDON.

The fifth afternoon visit of the members of the Architectural Association took place last Saturday, the 22nd inst., to the New Scottish National Church, dedicated to St. Andrew, and situated in Pont-street, Belgrave-square. We give a view and plan of the building this week.

The visitors were met by Mr. J. Macviear Anderson, the architect of the building, and on the Communion-table were displayed a large number of working and detail drawings. Close by was exposed the foundation-stone, inscribed:—"To the glory of God. This stone was laid by the Right Hon. the Earl of Aberdeen, Lord High Commissioner to the General Assembly of the Church of Scotland, May 2nd, 1883." An account of this ceremony, together with a general description of the church, was given in this journal at the time (see *Builder*, May 5th, 1883). Mr. Anderson, who, as many of our readers are aware, is the hon. secretary of the Royal Institute of British Architects, in describing the church, commenced by explaining that the differences between the service of the Church of Scotland and that of the Church of England required an entire difference of arrangement in the treatment of the chancel and its surroundings, no east window and no altar being required, but simply a plain communion-table, as seen.

The baldness and severity of church architecture in Scotland is proverbial, or, at all events, was so till a few years since. The revival of ecclesiastical architecture in England has, however, exercised an undoubted influence north of the Tweed, where formerly it was the rare exception to find a church designed with any regard to architectural propriety, and where it is now happily the exception to find any modern church that is devoid of it. It is true that the Presbyterian form of worship is characterised by great simplicity,—a simplicity which all true well-wishers of the Church of Scotland desire to see maintained,—but many churches erected within the last few years demonstrate that there is nothing in the simplicity of the service which is at all antagonistic to its observance in an edifice partaking of a liberal amount of architectural elegance and ornamentation. The present building might be taken as being thoroughly representative, both as regards the manner in which the service of the Church of Scotland is now conducted, and as regards the architectural adaptation of the building to the requirements of the service.

In lieu of the altar at the east end, the space is occupied by a high reredos containing the Ten Commandments, &c., the illumination of which has been executed by Messrs. Heaton, Butler, & Bayne. Over the reredos is a large marble mosaic decoration by Messrs. Burke & Co. The pulpit, a fine one, was carved by Mr. Raddock, and cost about 130l. The brass pulpit-rail, the gasfittings, and external wrought-iron railing are all executed by Messrs. Brawn & Co., and the organ by Messrs. Forster & Andrews. The contract for the building has been undertaken by Mr. E. Lawrence, and is fast approaching completion. Mr. Anderson said the church was planned to accommodate 500 persons, but sittings could be found in the nave and gallery for 1,000. The seats were all executed in pitch-pine, varnished. The cost of the building, exclusive of the organ and furniture, was about 12,000l., that of the

site over 8,000l. It was contemplated, if funds were forthcoming, to also erect a clergyman's residence on the site. There is a large hall in the basement for congregational purposes. Here is also the heating apparatus (under front entrance) by Haden, of Trowbridge. This portion of basement is lighted by Hyatt's lights. The exterior walls of the church are faced with red bricks and Douling stone dressings. The internal stone, where used, is Bath (Corsham Down) stone, and the shafts of the nave polished Peterhead granite, and the smaller shafts to windows polished Aberdeen granite. The whole of the windows are glazed with tinted glass by Pickering, of London. The ventilators in the clearstory windows are all easily and simultaneously opened by Elsiey's patent apparatus, and shut by the same gear. The roof is covered on the underside with stained deal. The mosaic paving to nave, chancel, &c., is also by Messrs. Burke & Co. The external doors all open outwards for safety in case of panic or alarm of fire.

We understand that the church (which is intended for the congregation of the church in Crown-court, Covent Garden, for so long the scene of the ministry of the late Dr. Cumming) is shortly to be opened for Divine service.

OLD CHIMNEYPiece AT IPSWICH.

The chimneypiece from which this measured drawing has been taken is in its original position in an old house in the parish of St. Clement, Ipswich, and is one of the many examples of old oak work in which Ipswich still abounds. The original owner of the house was a Mr. Thomas Eldred, and the room in which is this chimneypiece is entirely panelled.

Thomas Eldred was a companion of Cavendish in one of his voyages round the world, and he it was, in all probability, who fitted up this room in the state in which it still remains to this day.

The circular-headed panels in the upper part of the chimneypiece have old paintings in them. In the centre panel is a painting of a globe with an inscription underneath giving the dates when Eldred sailed, &c., but it is difficult to decipher it. In the panel on the left is a painting of a ship in full sail, and in the panel on the right is the portrait of a man who is looking through a glass. The inlay work shown in the drawing is distinctly traceable through the paint in all the panels.

Tradition says that the panelling round the room was taken out of the cabin of the vessel in which Eldred circumnavigated the world; of course it is impossible to prove this, but certain peculiarities in the panelling point to the fact that it is probable that it came out of a ship's cabin, which in those days was so often beautifully fitted up.

THE CATHEDRAL AND NEUMÜNSTER-
KIRCHE, WÜRZBURG.

THE SCENE OF LONGFELLOW'S POEM "WALTER
VON DER VOGELWEID."

The cathedral and Neumünsterkirche, or church of the New Minister at Würzburg, stand side by side. They are rather peculiar examples of German Romanesque work externally, but internally scarcely a vestige of their original style is discernible, as walls, pillars, vaulting, and arches are coated with stucco work executed during the eighteenth century. It must be acknowledged that there is much artistic skill and elegance in this modernisation, as far as at least as the cathedral is concerned, and that the angels or Cupids bearing the corbels of the vaulting, the wreaths, cornucopias, shellwork, &c., are delicately and sharply modelled. Of course every one who admires ancient ecclesiastical architecture must regret the generosity of Von Waltersdorf, a priest of the cathedral, who left his money, in 1700, for the restoration of the church. Unfortunately, from an art point of view, he lived three or four centuries too late. We must, however, strongly deprecate the suggested internal restoration, which would destroy Von Waltersdorf's work, because, although of a low and poor style, it is a good example of its class, and is excellent in point of workmanship.

The cathedral was commenced in 862, and possibly the crypt below the choir may be of this date. The rest of the church, however, was rebuilt between 1189 and 1230. The two

elegant towers flanking the choir are of the latter date. One of these towers is built in alternate courses of red and white stone, but the other is entirely of white stone; both of the western towers are striped.

The small dome-capped chapel adjoining the north transept was erected by Bishop Schornborn, who died in 1721, and is buried here. The Emperor Frederick Barbarossa was married in this church.

A court, which was until some half a century back a cemetery, separates the cathedral from the church of the "Neumünster." Why this very ancient church is called the "New Minister" is difficult to say, as it certainly existed before the year 854, when it is recorded that it was greatly injured by lightning. The apse, choir, and eastern transepts were rebuilt in the year 1000, but nothing now remains of this date except the curious crypt below the choir. The eastern portion of the building, and the very elegant octagonal tower, are probably not earlier than the thirteenth century. The western portion of the church is covered by a vast octagonal dome and lantern, which was completed in 1731. Below it, however, is a very ancient crypt containing the well in which the bodies of St. Killian, St. Totnan, and St. Colonatus were found after their martyrdom, about the year 687; it is possible that some portion of this crypt may be part of the church erected in 854; but, like the rest of the interior of the building, it was all modernised about 1730.

In the court between the cathedral and the Neumünster towards the east of the latter church Walter von der Vogelweid was buried in 1720. He is best known to the English public by Longfellow's charming poem, which relates how,—

"Vogelweid, the Minnesinger,
When he left this world of ours
Laid his body in the cloisters,
Under Würzburg's minister towers."

The poem goes on to relate how the poet left by his will a sum of money to be expended upon loaves of bread to feed the birds upon his tomb, which was carried out, and,—

"Day by day, o'er tower and turret,
In foul weather and in fair,
Day by day, in vaster numbers,
Flock'd the poets of the air."

All went on well, and to the satisfaction of the birds, until some miserly old "abbot" (Longfellow is in error here, as the church was collegiate, and, of course, never had an abbot) considered the whole thing a piece of waste and extravagance, and ordered the loaves to be "changed to loaves henceforward for our fasting brotherhood."

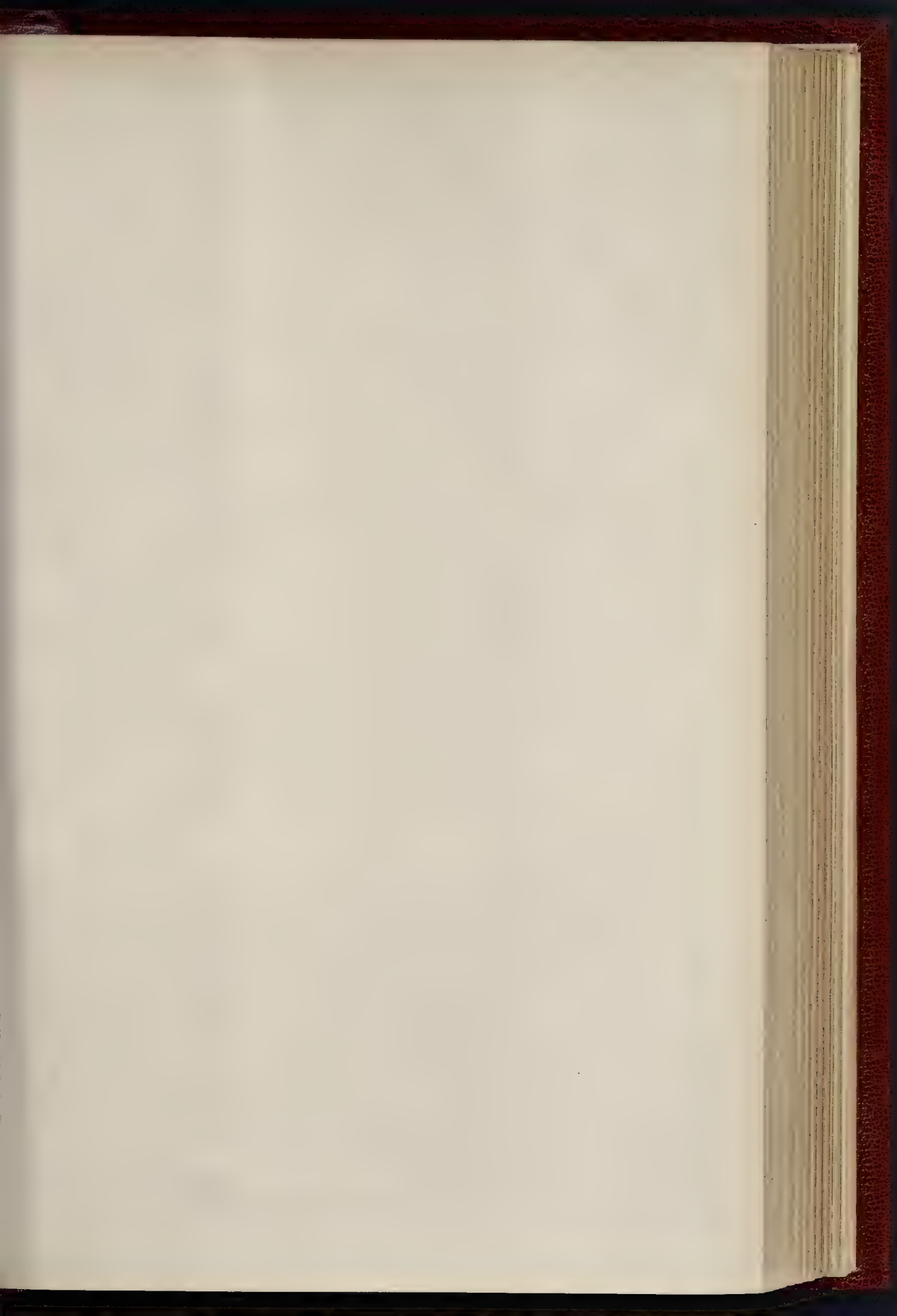
Longfellow notices a fact which must have struck every observant visitor at Würzburg; that is, the number of birds always to be seen about this spot:—

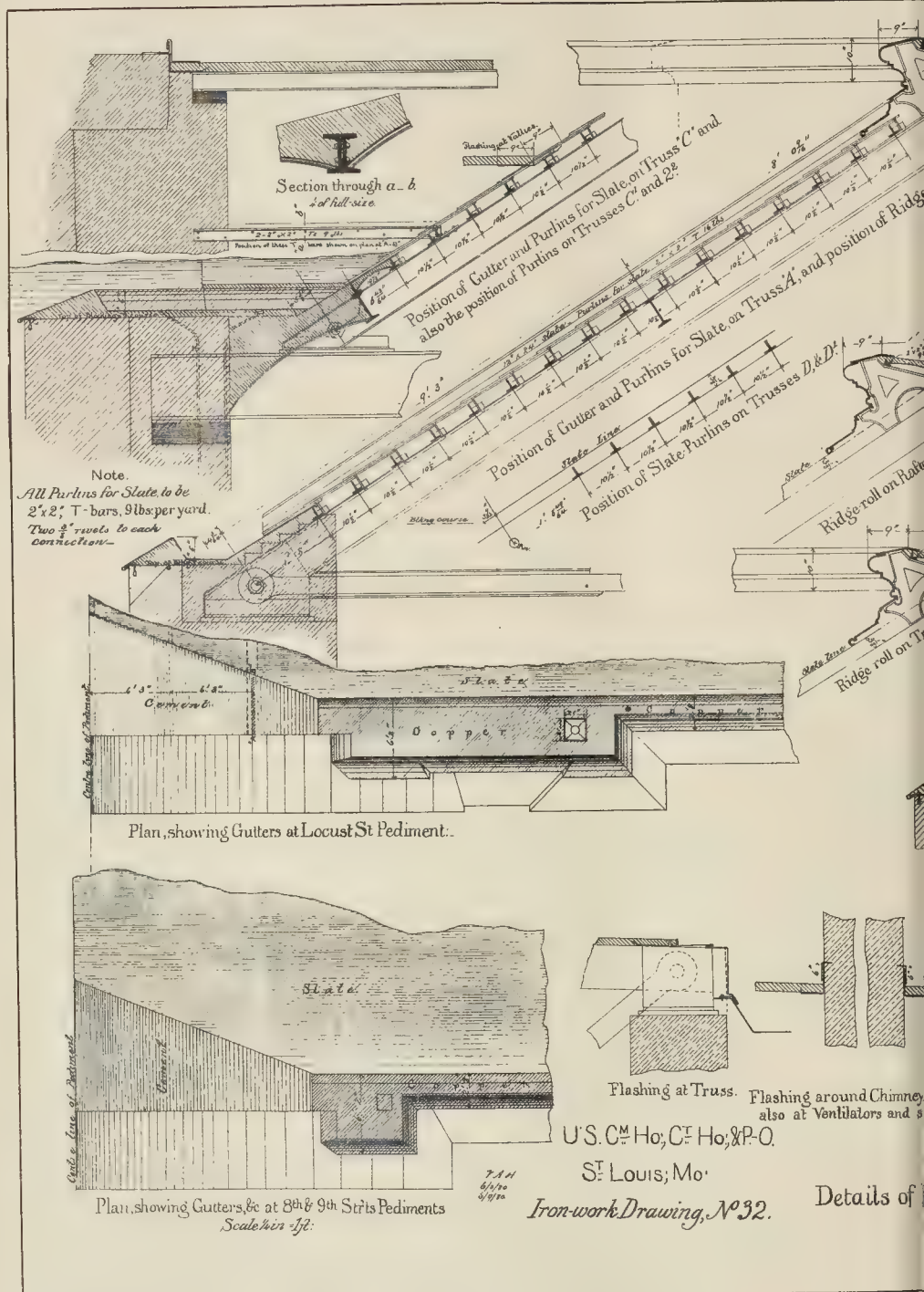
"But around the vast cathedral,
By sweet echoes multiplied:
Still the birds respect the legend
And the name of Vogelweid."

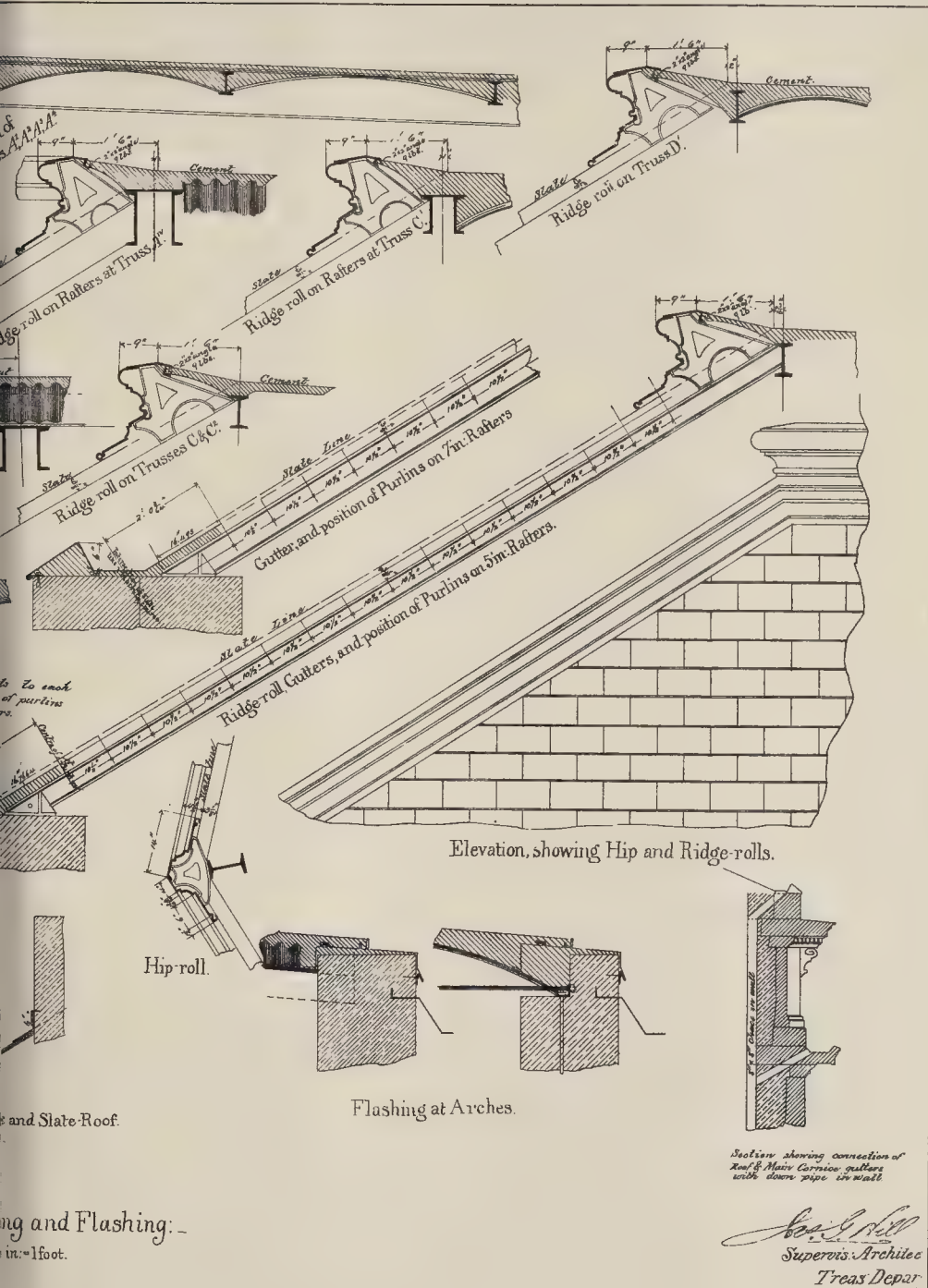
A small modern tablet affixed to the east end of the south aisle of the Neumünster was set up by King Ludwig as a memorial to Vogelweid; probably his original monument was destroyed when the cemetery was paved over and a street run through it. Some very remarkable cloisters were discovered at the Neumünster about a year ago, which were described and illustrated in the *Builder*. Longfellow is probably in error in describing Vogelweid as being buried in the cloisters of the Neumünster, as the cloister was to the north of the church, but the cemetery was to the south. The cloisters of the cathedral, which are a most singular example of foreign "Perpendicular," are on the south side. They present one of the very few examples of Perpendicular tracery to be found out of England. The vaulting is also very remarkable, as each respond is opposite to the centre of its opposite bay. Thus the diagonal forms the main rib. Both the cathedral and the minister contain many interesting monuments. Those in the former church have been previously alluded to and one of them illustrated in the *Builder*. H. W. B.

International Health Exhibition, London.—This exhibition will be opened by the president, H.R.H. the Prince of Wales, on Thursday, the 8th of May, at 3 p.m.

* See vol. xiv., pp. 179, 182.

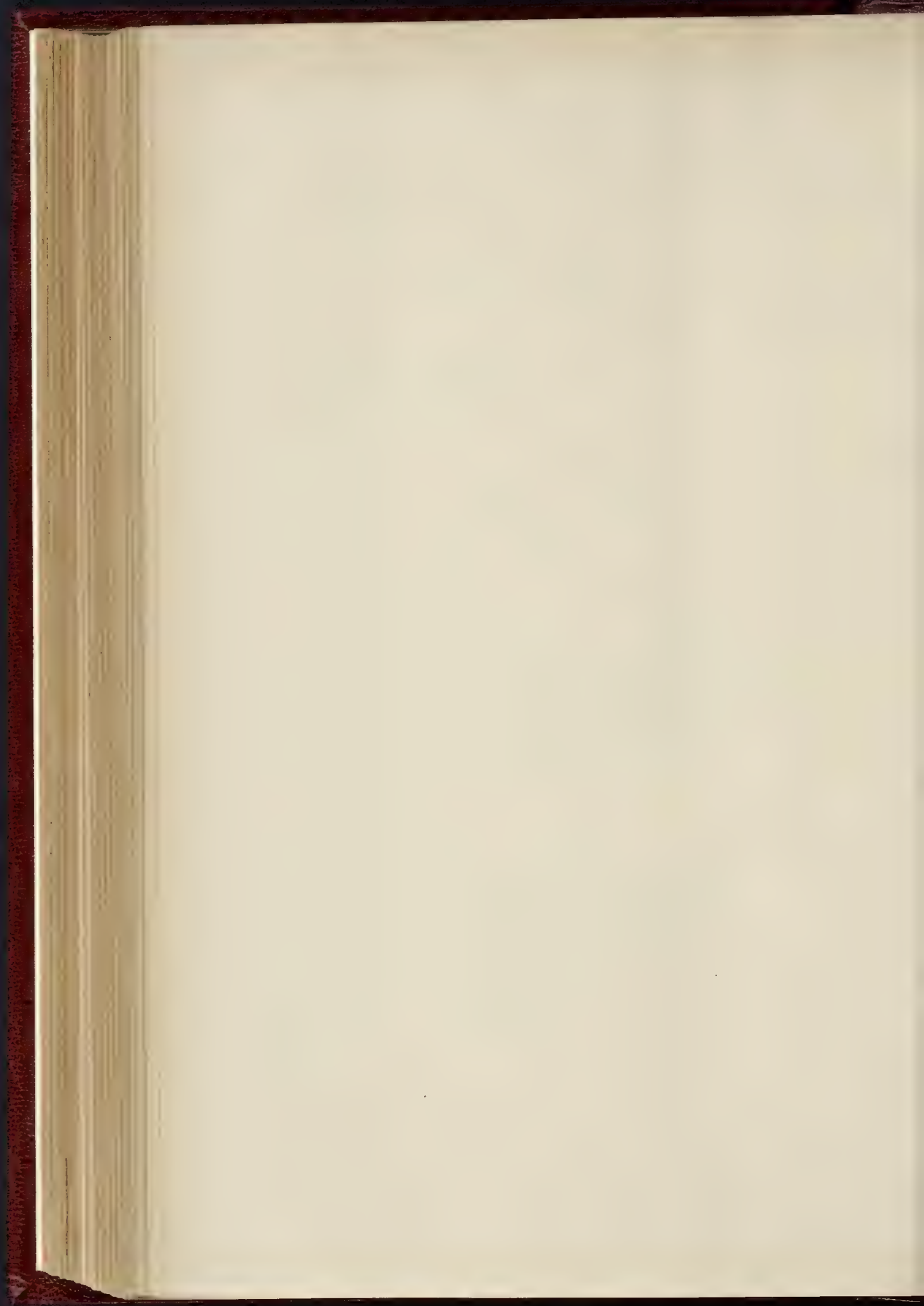


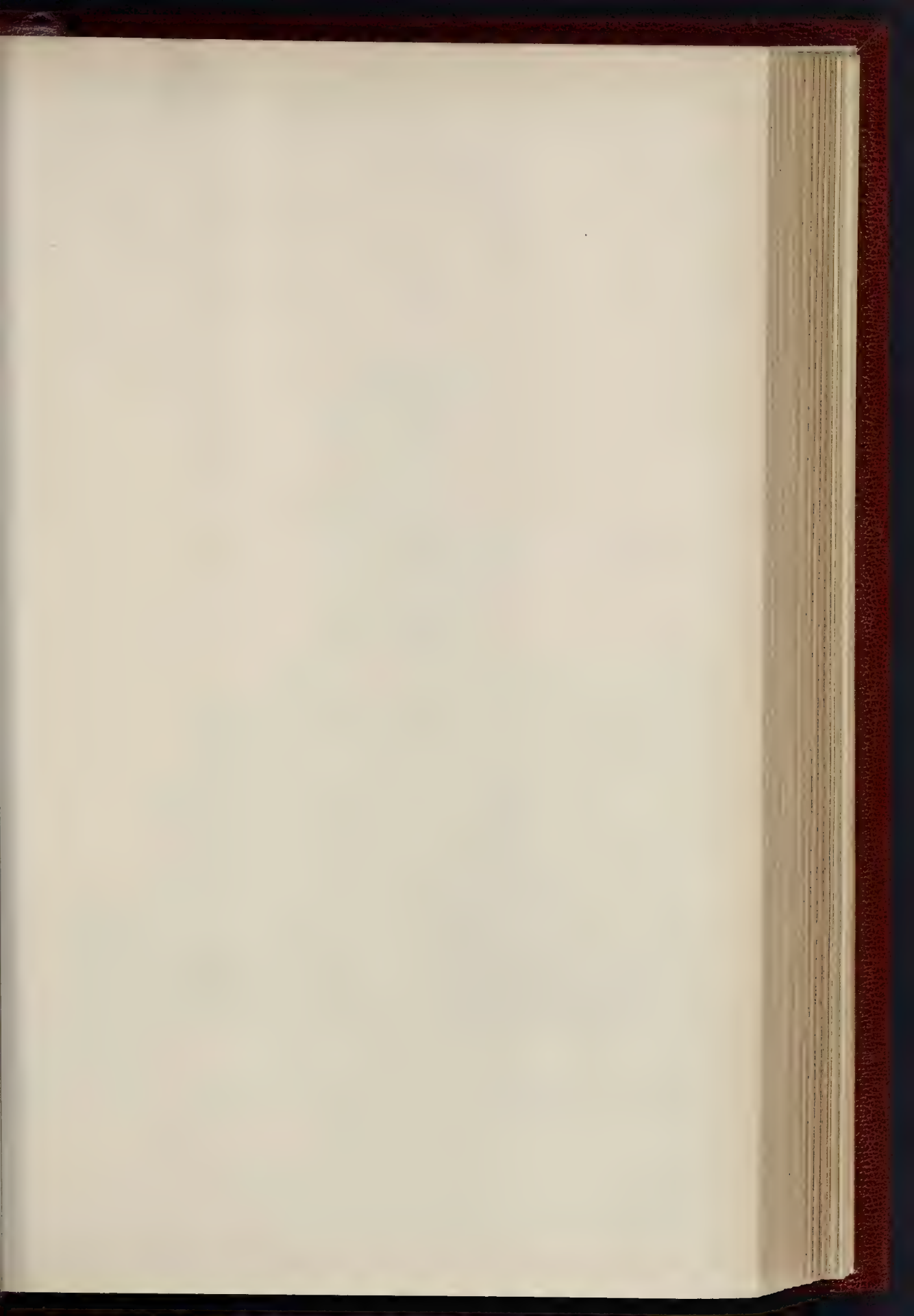




and Slate-Roof.

ing and Flashing:—
in. = 1 foot.





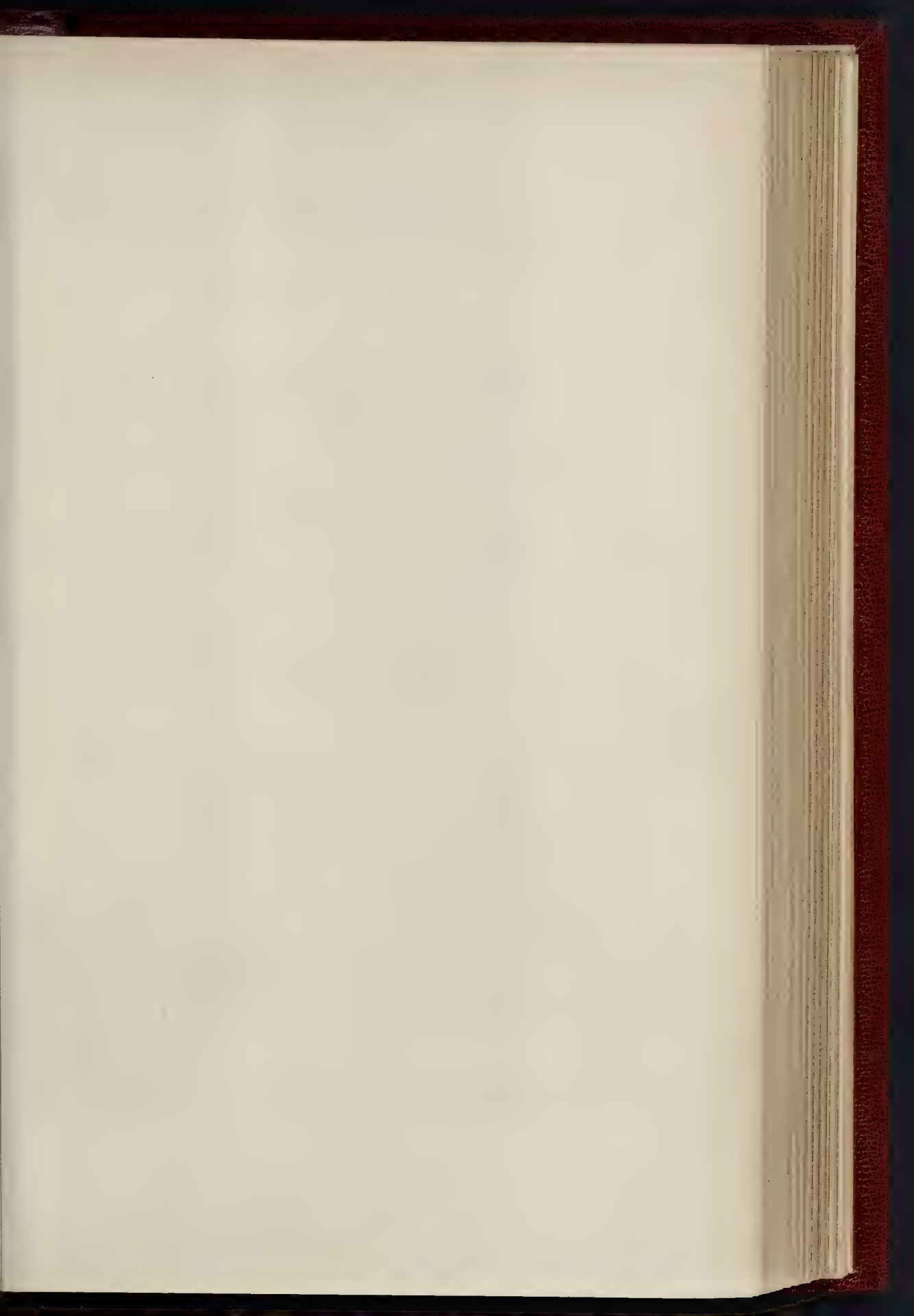


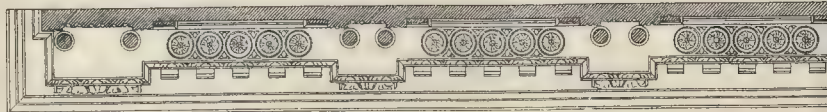
Wyman & Sons Photo-Litho

Queen St. London, W.C.

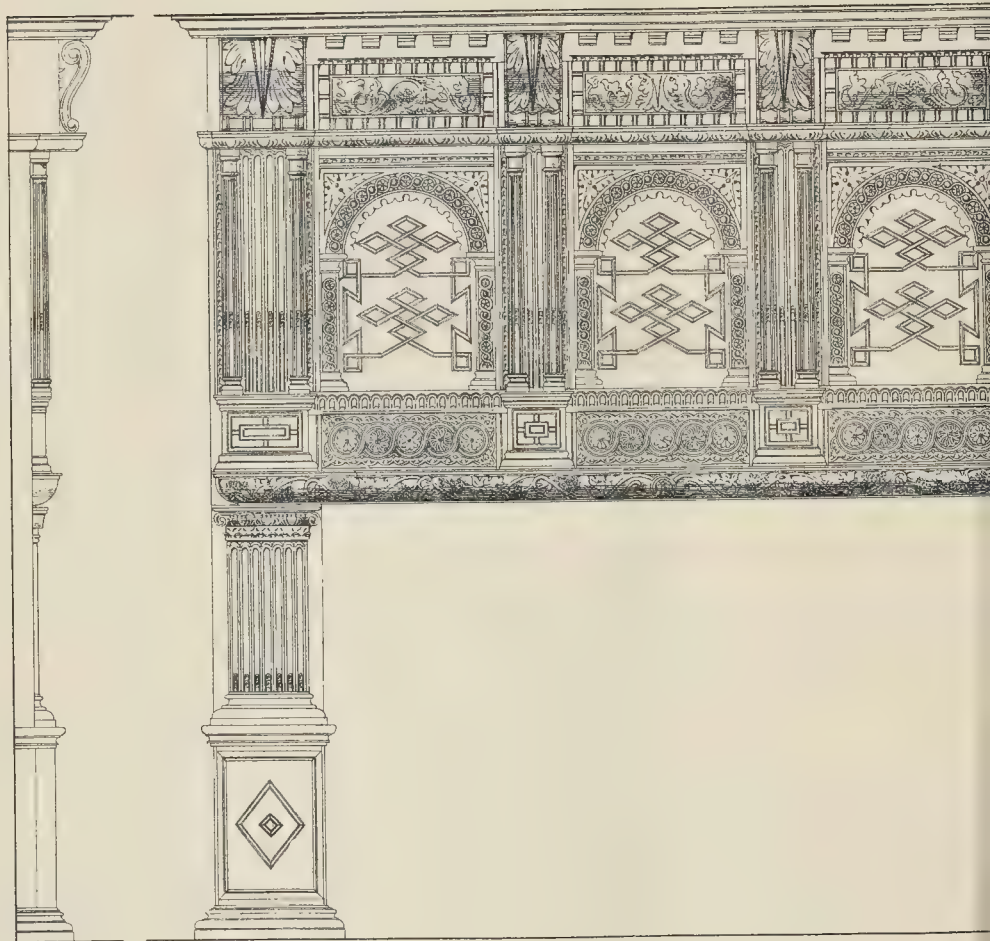
THE SCOTTISH NATIONAL CHURCH, PONT STREET, BELGRAVIA.

MR. J. MACVICAR ANDERSON, F.R.I.B.A., ARCHITECT.





Plan at b
(looking up)



End
Elevation

Front Elevation

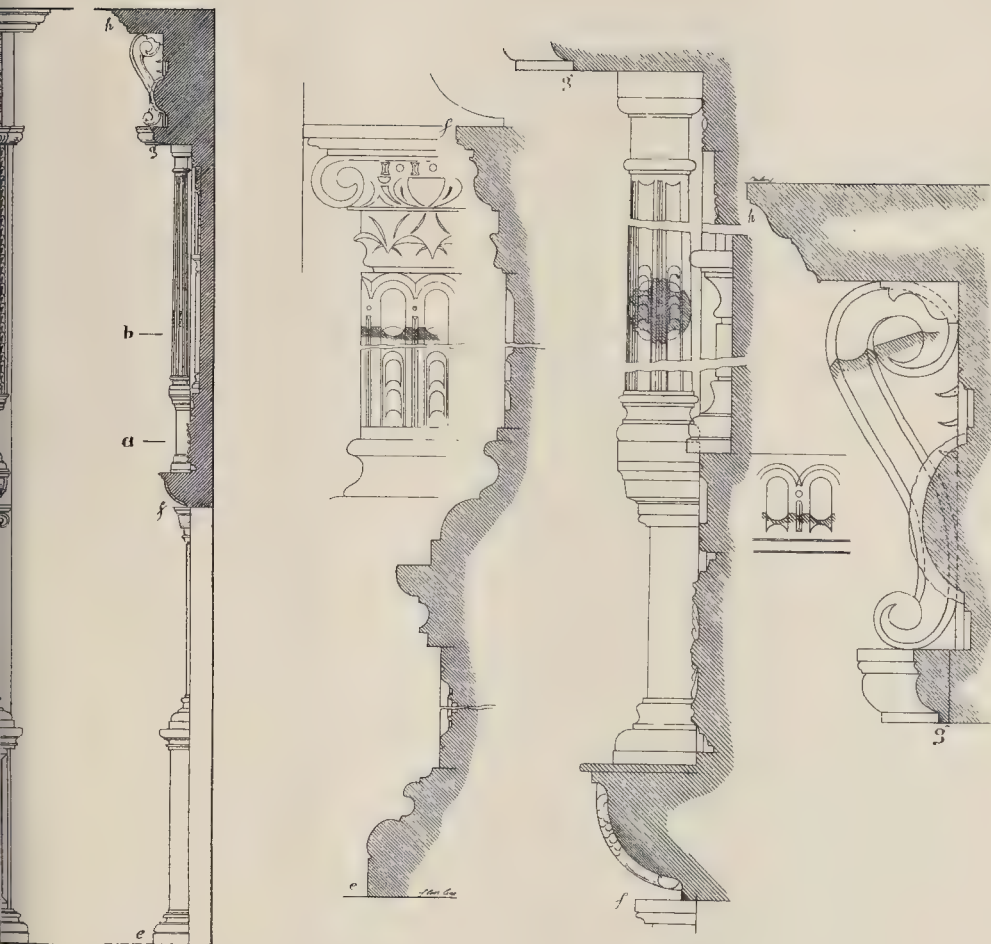


Plan at a



Scale of Feet

Old Chimney Piece at Ipswich



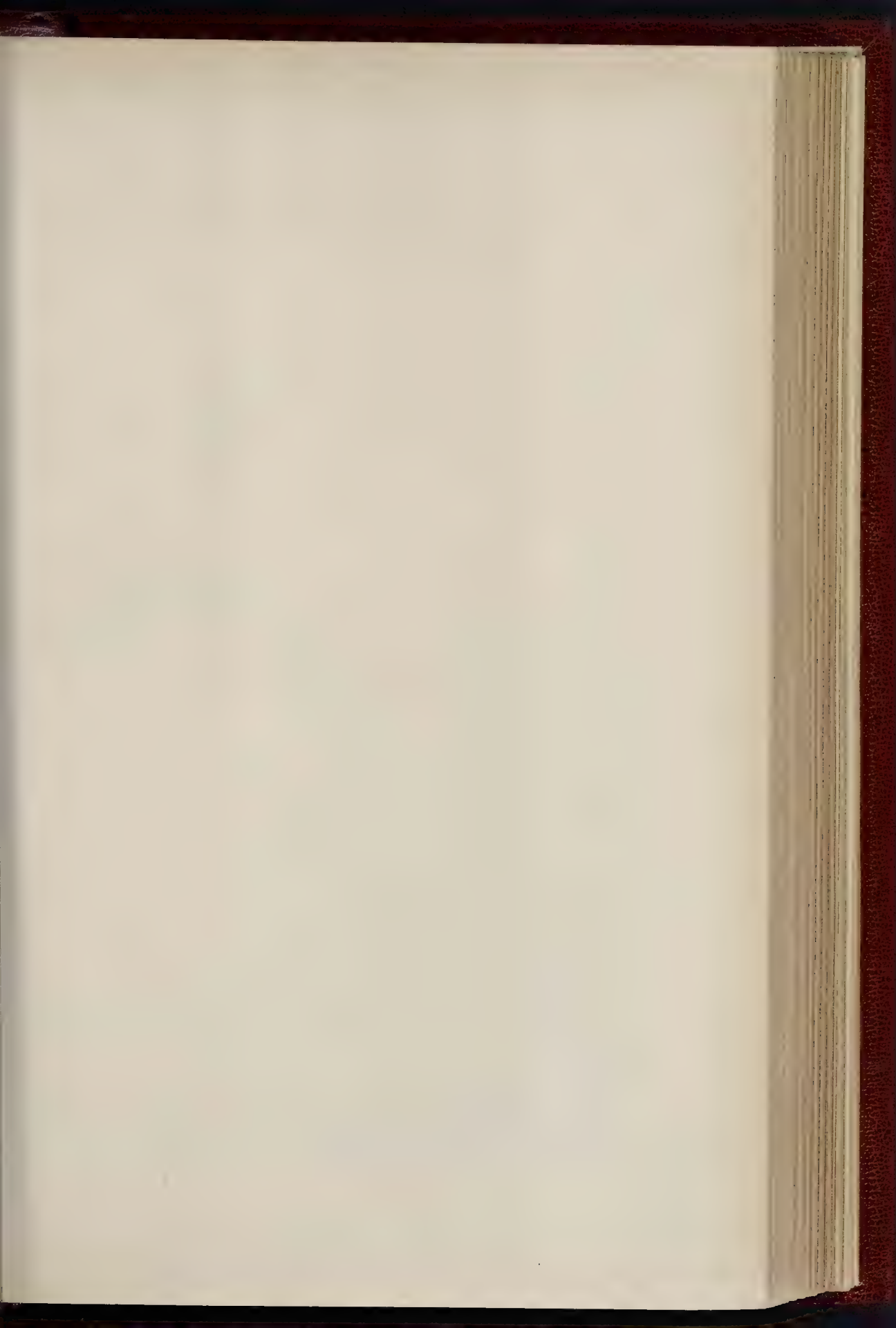
Section
Thro' Centre

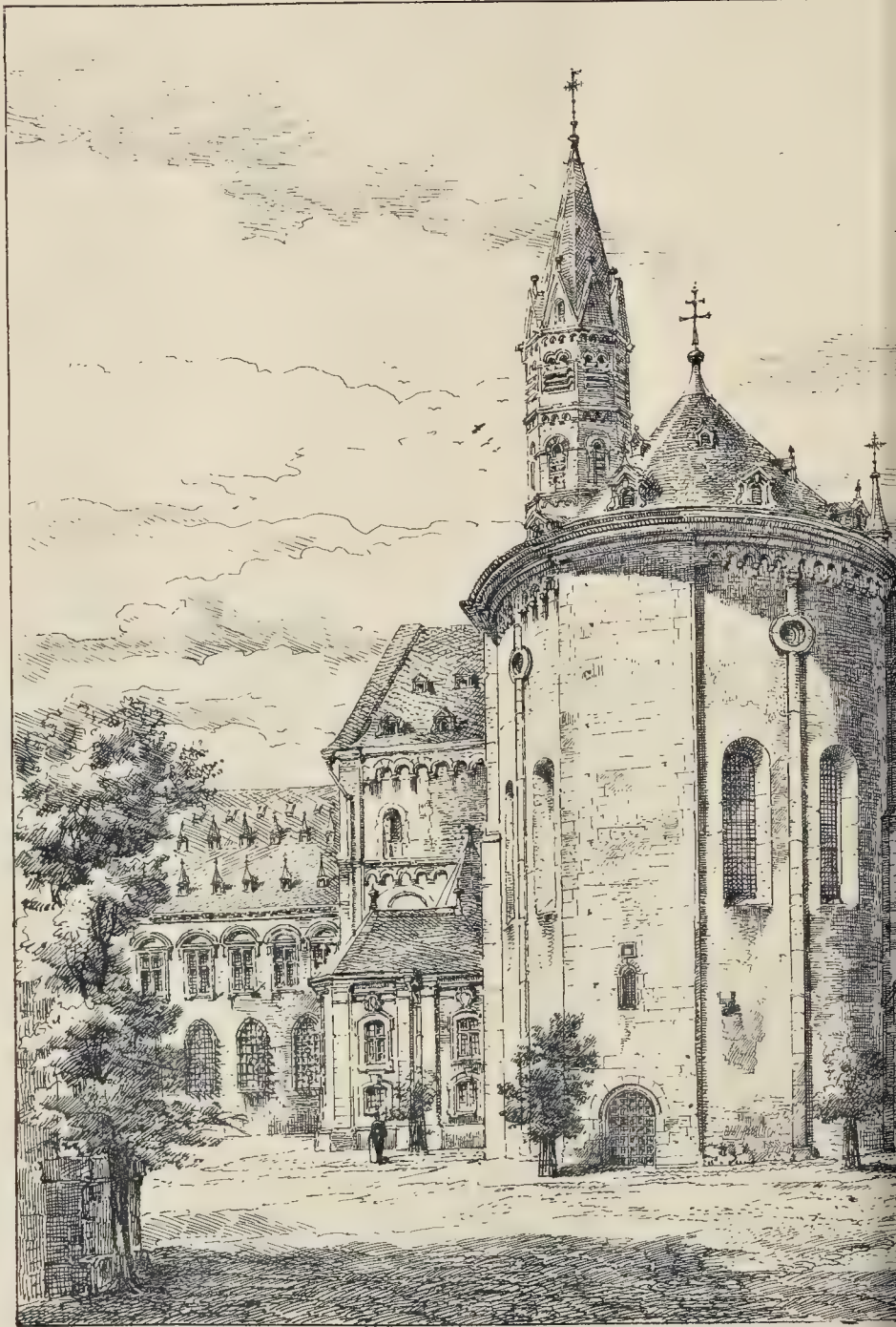
MEASURED AND DRAWN BY

MR. FRANK BROWN,

SEPTEMBER, 1884.

feet

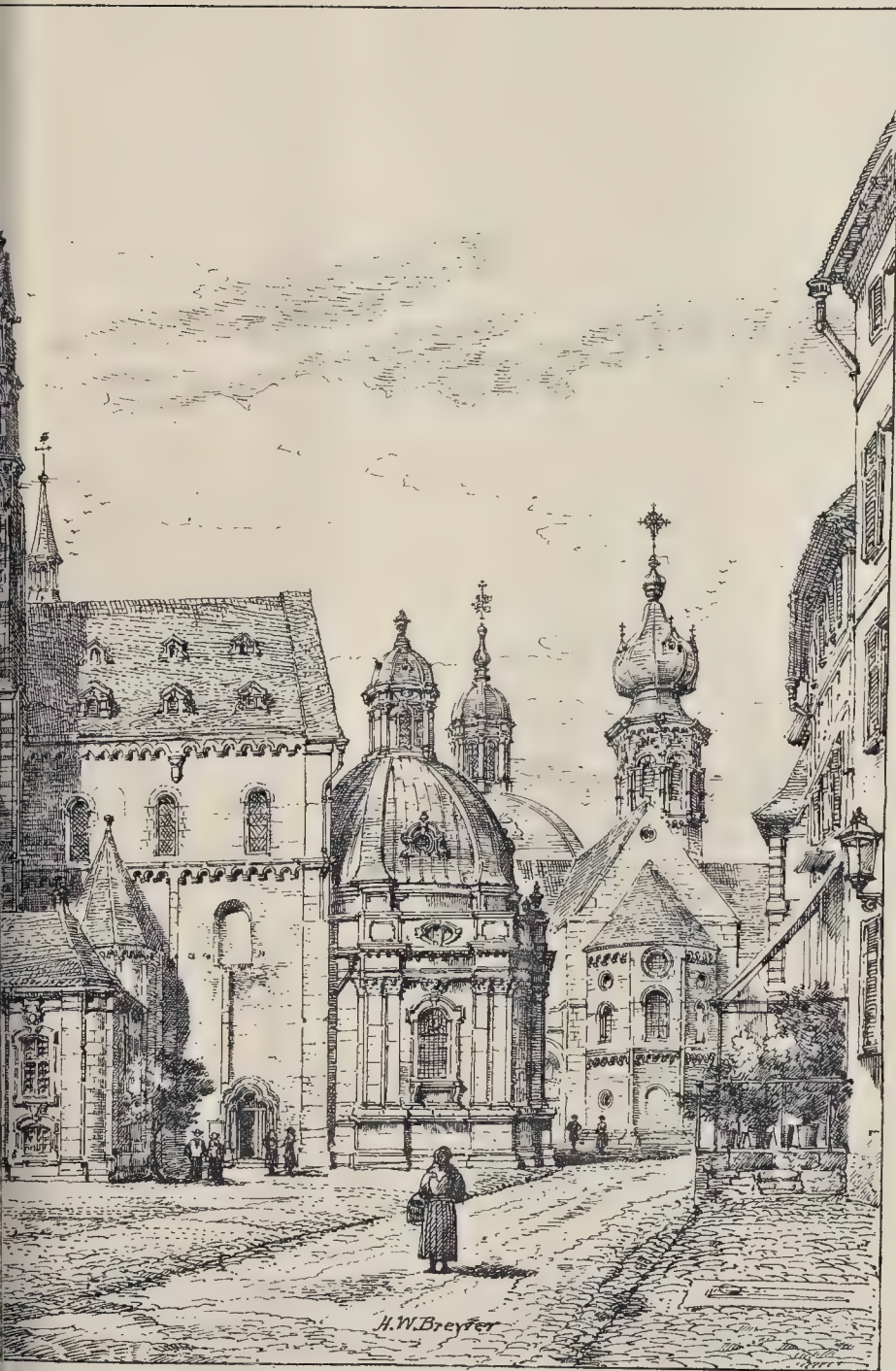




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THE CATHEDRAL AND

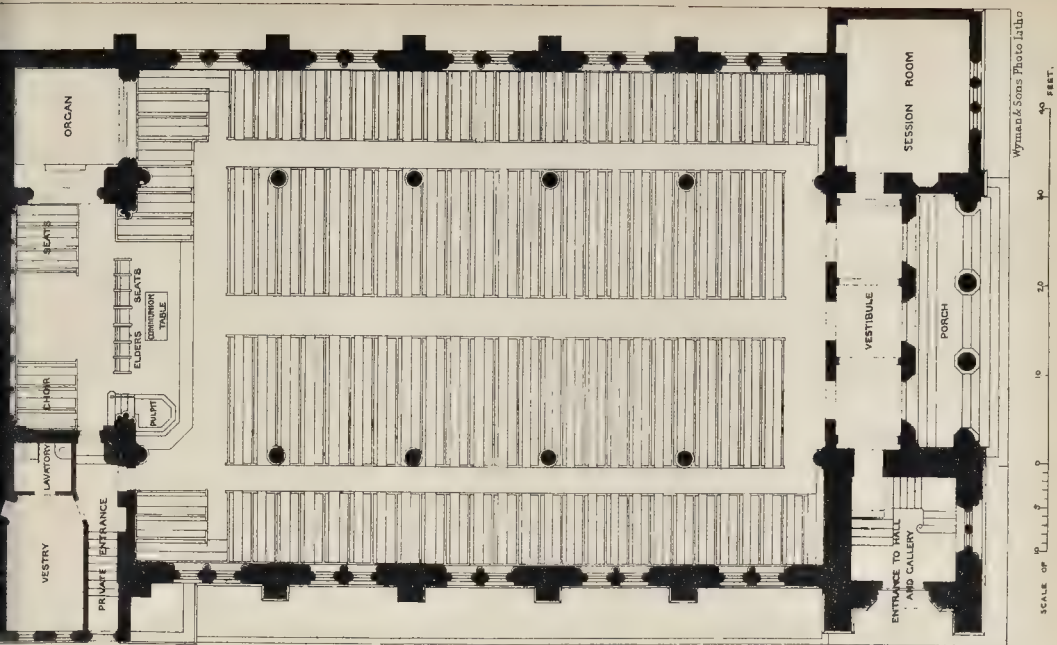
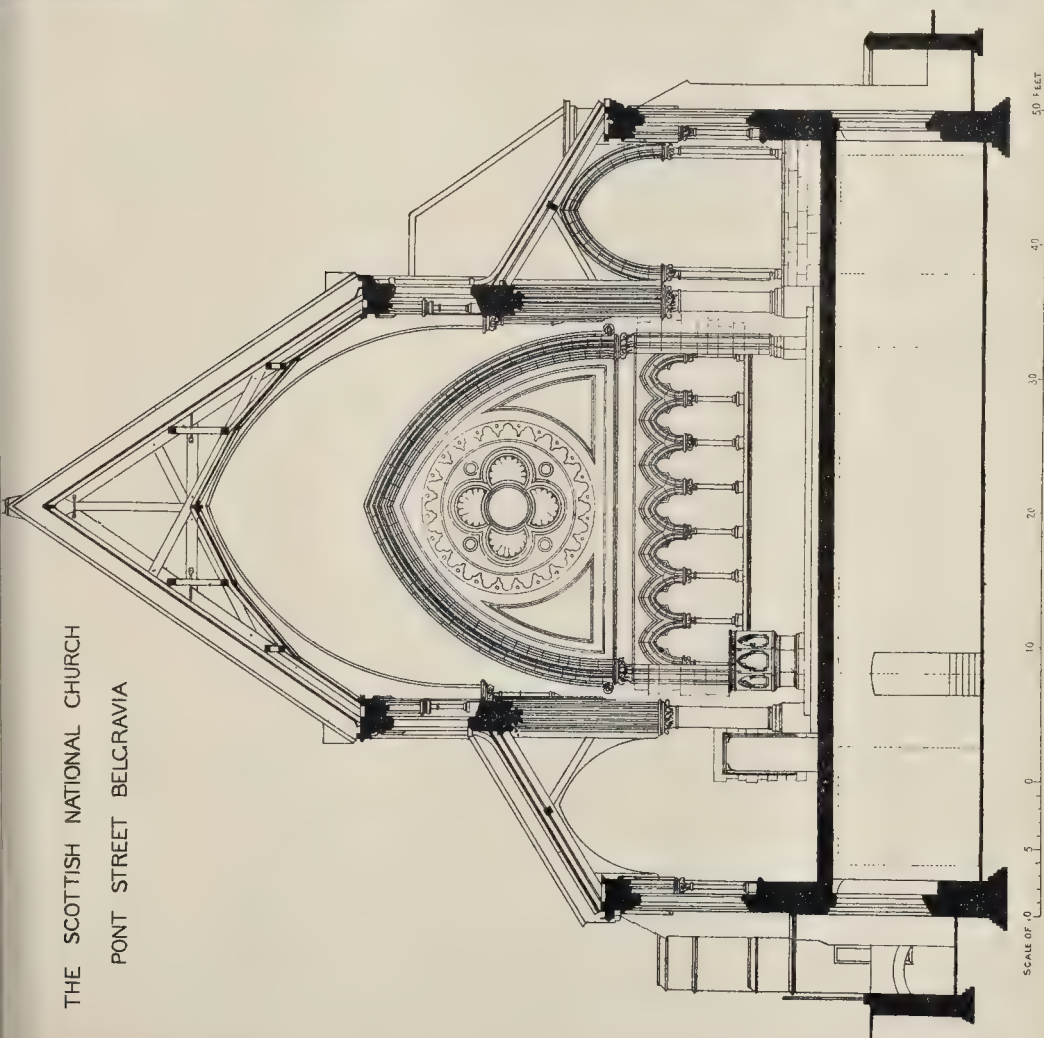
SCENE OF LONGFELLOW



KIRCHE, WÜRZBURG.
IN DER VOGELWEID."

8 Castle St. Holborn, London E C

THE SCOTTISH NATIONAL CHURCH
PONT STREET BELGRAVIA



Wynd & Sons Photo Litho

THE BUILDING TRADES' EXHIBITION.

THE fifth annual Building Trades' Exhibition, now being held in the Agricultural Hall, Islington, though it includes a fairly good representative collection of building materials and workmanship, is scarcely so large and hardly as varied in its contents as last year's show. Several prominent exhibitors in previous years are this year absent from Islington, preferring to reserve their energies for the International Health Exhibition at South Kensington. Their places are supplied by other exhibitors, some of whom are positive accessions to the exhibition. Among such exhibitors we may especially instance Messrs. Wedgwood & Sons, whose exhibits are referred to further on. But, although there is what is described in one of the daily papers as an "overflow arrangement" in the galleries, the ground-area of the hall is barely filled, even though carriages and furniture are called in here and there to eke out the space. The contents of the galleries are very meagre, and, with the exception of a few architectural drawings, have for the most part nothing to do with building. For the greater portion of Monday the exhibition was the scene of much confusion and noise, caused by the dilatoriness of some of the exhibitors, who were only then erecting their stands and getting their goods into position, greatly to the discomfort, not only of visitors, but of those exhibitors who had everything in readiness for the opening of the exhibition. It is only fair to the management to say that this unreadiness is solely due to the exhibitors themselves. By the time these words are published, however, the exhibition (which is to remain open until Saturday, April 5th) will have been put into proper order, and will, no doubt, as in former years, attract large numbers of visitors; for, needless to say, there is much to be seen by everybody, and here and there something to be learned by experts, although, as far as we could see, the exhibition does not contain many novelties of a notable character. Without further comment on the exhibition as a whole we proceed to notice some of the individual exhibits, taking the names of exhibitors in alphabetical order, inasmuch as the numbering of the stands is somewhat complicated.

The Albion Concrete Company (Bay 4), of Glengall-road, Old Kent-road, exhibit a built-up bay-window made of their material, of a buff tint. This is one of a series of bays being made by the Company for Mill's Hotel, St. George's-road, Southwark, from designs by Mr. H. W. Flack, architect. The same exhibitors show some pieces of cornice, balustrading, and other details in red-tinted concrete, executed by them for the new building in Marylebone-road for Madame Tussaud's Exhibition, Mr. F. W. Hunt, architect. The material has a good surface, and the arrises come out sharp and clean.

Messrs. Allen & Genge (Bay 75 in Arcade), of Devonshire-street, Theobald's-road, exhibit some good work in canvas and plaster, including two well-modelled columns specially designed for the Hurlingham Club by Mr. R. W. Edis, F.S.A.

Messrs. Thomas Andrews & Co. (Stand D 129), of East Molesey, exhibit some well-made and useful joinery in pitch-pine and other woods, for ecclesiastical and domestic use. They also show a chimney-piece and over-mantel in pitch-pine.

Messrs. Ashton & Green (Ltd.), of St. Mary Axe, are mentioned in the catalogue as exhibitors of chimney-pieces and other goods, but at the time of our visit we could not discover their stand.

Messrs. J. L. Bacon & Co. (Stand E 176), of Upper Gloucester-place, Dorset-square, exhibit some of their well-known and largely-used hot-water apparatus in action, the wrought-iron tubes used being 1½ in. in diameter, and capable of sustaining a high pressure. The wrought-iron furnace used requires no setting in brick-work.

Messrs. E. P. Bastin & Co. (Stand 244, East End), of West Drayton, are exhibitors of brick-making machinery and appliances for the hand-moulding process.

Messrs. Bellman & Ivey (Stand C 72A), of Wigmore-street, show Bellman's patent gully, a very good and simple appliance for receiving and disconnecting rain-water down-pipes, sink-states, &c. We have on previous occasions referred to it with commendation.

The Blackman Air-Propeller Company (Stand B 21), of Fore-street, show in action

two of their mechanical ventilators, which have been largely used with good results in many manufacturing establishments where the presence of foul air, steam, and vapour would be injurious to the workpeople. There is a wide field for the employment of such appliances for ameliorating the generally (at night) overheated and vitiated atmosphere of printing-offices and other establishments where steam power is available.

Mr. J. M. Bookbinder (Stand D 126), of Thornhill-road, is an exhibitor of some excellent work in carton-pierre and fibrous plaster, including the side of a dining-room in the style of the Flemish Renaissance, with a panel filled with painted tapestry. The side of a drawing-room in Louis Seize style exhibits very careful modelling.

Messrs. John Bolding & Sons (Stand C 82), of South Molton-street, have on view a large display of sanitary appliances, including a new wash-out closet, called the "Alliance." They also show a seat-action syphon water waste-preventing cistern, so arranged that when the seat is depressed a weighted lever is drawn down, the release of this lever opening the valve and discharging the water forcibly through the syphon, effecting a good flush. Truss's "ever-sealed" stretch-traps are another speciality at this stand. The traps are simple in construction, a metal valve acting on the end of the inlet-pipe within the trap, the valve-opening to allow of sewage matter passing from the house to the drain, and closing by its own weight, thus giving a mechanical as well as a water seal.

Mr. F. Botting (Stand E 151), of Mount-street, shows some of his sanitary appliances and kitchen fittings.

The Bower-Barff Rustless Iron Company (Stand B 36), of Queen Victoria-street, exhibit a variety of samples of cast and wrought iron treated by their method, which is stated to be less costly than the galvanising process, while being absolutely permanent in its effects. If this be so it ought to be more largely used than it is. Among the specimens of ironwork exhibited as having been treated by the process is a nicely-wrought flower-stand executed by Messrs. Hardman.

Messrs. C. J. Boyce & Co. (Stand 248), of Miles's-lane, Cannon-street, exhibit saw benches and other machinery for the joiner's and carpenter's shops.

The Bracknell Pottery Company (Stand A 2), have a good display of hand and machine made red facing bricks, together with roofing and paving tiles, ridges, finials, &c., all exhibiting excellence of manufacture.

Mr. W. Bragg, jun. (Stand C 84), of Old-street, exhibits his patent reflecting pavement lights, and a system of slab plastering very like something which has been seen before.

Messrs. Broad & Co. (Stand E 162), of Pad-dington, are exhibitors of white enamelled ware made by the Bournthorpe Company. They also have on view sanitary stoneware, including their registered gully and a new air inlet. Broseley and other tiles, ridges, finials, and bricks go to make up the remaining contents of the stand.

Mr. E. H. Brown (Stand 252, south side), of Kingsbury Works, Ball's Pond, exhibits a strong horizontal steam hoisting and winding engine, together with a mortar-mill, circular saw benches, band-sawing machine, and the "Cheap" friction barrow hoist,—all of them very useful items of builders' plant.

Messrs. Butters Bros. (Stand 284, North-west Corner), of Glasgow, are exhibitors of derrick cranes and other appliances used in building.

Messrs. Capper, Son, & Co. (Bay 12), of Ingram-court, Fenchurch-street, show Pearson's new patent water-economising closet, which deserves inspection. The same firm are also exhibitors of Pearson's "twin-basin" closets (of which we have previously spoken on several occasions), and of some very handy and compact folding lavatories, suitable for use in offices, on board yachts, and, in fact, in any situation where space is limited and where tidiness is a desideratum.

Messrs. Chambers, Monnery, & Co. (Bays 55 and 56 in Arcade), of Bishopsgate-street, show Monnery's patent iron wall ties, for use in building hollow walls. The newest forms of these ties have turn-down points at the extremities, affording a better hold of the brickwork, while the central portion is made with shoulders which abut against the inner faces of the walls, materially strengthening them and lessening

the possibility of their being pushed inwards. This firm also exhibit the "Bishopsgate" mantel and grate, the "Larbert" cooking-range, and some other ranges, well suited for use in artisans' dwellings.

Messrs. Clark, Bunnett, & Co. (Stand A 8), of Rathbone-place, are exhibitors of their self-sustaining lifts, hydraulic hoists, revolving shutters, spiral iron staircases, and brass and bronze castings for ornamental and constructive purposes. Their "Kaio Kapos" stove, the invention, if we remember aright, of an architect, is also shown at this stand.

Messrs. W. R. Crow & Son (Bays 57 and 58 of Arcade), of Benjamin-street, are exhibitors of good assortment of yellow doors and mouldings, balusters, handrails, newels, and general house joinery, well worth the inspection of builders.

Messrs. R. F. Dale & Co. (Bay 1), of Southwark, are exhibitors of plumbers' brasswork and sanitary fittings and earthenware.

Messrs. H. & C. Davis & Co. (Stand C 98), of Camberwell-road, exhibit some very good gas-stoves, foremost amongst which we must mention the "Metropolitan" gas-kitchen, which is highly spoken of by those who have used it.

Mr. T. H. P. Dennis (Stand F 190), of Chelmsford, shows his new patent lock furniture and his systems of glazing. With regard to the former, the spindle of the lock is tapped with a screw-thread at each end, in the direction of its length. The knobs are also tapped in the centre of their outer end with the same screw-thread as the spindle, and they are secured to the spindle by a uniting screw which passes through the knob and engages into the screw-thread of the spindle.

Messrs. Diespeker & Co. (Stand F 222) exhibit some good specimens of marble mosaic work.

Messrs. M. O. Duffy & Son (Bays 73 and 74 of Arcade), of Stork-road, Bermondsey, show a variety of building and general turnery, including balusters, newels, table-legs, &c. They offer thirty-six patterns of balusters at one uniform low price.

Messrs. Esdaile & Company (Stand B 38), of Wenlock Basin, City-road, exhibit doors and other joinery of Swedish and American make, besides English joinery and mouldings both English and foreign, hand and machine made plasterers' laths, and some well-made pulley-blocks suitable for builders' use.

The Eureka Concrete Company (Stand E 172), of West Kensington, exhibit one bay of the arcade of the Upton Congregational Church, Forest-gate, now in course of erection from the designs of Messrs. T. L. Banks & Townsend, architects. We shall shortly give an illustration of this building.

Messrs. George Farmiloe & Sons (Bay 19), of St. John-street, Smithfield, make a good display, prominent among their exhibits being three of American manufacture, viz., the Dubois draw-lead traps, the "Gibson" pump, and a case full of bib, range, and stop valves. The Dubois traps are now tolerably well known, so we will only say that besides the ordinary stock patterns, one known as Emptage's pattern is on view. It is claimed that a trap of this form will hold its seal secure under the most trying conditions. The "Gibson" pumps are made for forcing and lifting. They are of iron, lined with brass, and are strong and simple, while they are only about half as costly as the usual brass pumps. The plumbers' brasswork from America exhibits good workmanship, and affords another illustration of the foreign competition which is now so marked a feature of many trades, even of those connected with building. English manufacturers and workmen will evidently, however harmonious their relations, have to battle stoutly to hold their own in some directions. The "Rainbow" steam water and liquid raiser, shown at this stand, is virtually a steam pump without any working parts, but it was described by us not very long ago. Among water-closets, of which several varieties are shown at this stand, is a speciality in wash-out closets, named the "Eos," which has several good points. It is complete in one piece of earthenware, has no metalwork or movable parts, superseded the use of a trap on or under the floor-line, is always trapped, and maintains a good depth of water in the basin. The flush (supplied through a 1½-in. pipe from a water waste-preventer of special construction) is very efficient, being so directed as to carry everything before it. The basin is round, so that it may be set right or left hand. The water waste-preventer, which has been

designed by Mr. Raitt, consists of an outer chamber from which the supply-pipe before mentioned is taken. In this outer chamber a semicircular trough is pivoted, which, when full of water, is suddenly tilted up so as to discharge its contents at once into the outer chamber, whence they are conveyed to the closet basin by the pipe.

Mr. J. J. Greenwood (Stand B 55), of Lot's-road, Chelsea, is an exhibitor of marble chimney-pieces and fenders, encaustic tiles, and roofing slates.

Messrs. Griffiths, Berdoe, & Co. (Stand B 35), of Leadenhall-street, are exhibitors of the Sanitary Paint Company's non-poisonous paints and colours.

The Hastings Hydraulic Freestone Company (Bay 23A), exhibit specimens of their material, which is an artificial stone of fine texture, much resembling Portland in appearance.

Messrs. Hayward Bros. & Eckstein (Stand C 88), of Union-street, Borough, are exhibitors of Hayward's patent semi-prism and other pavement lights, shown applied also to stairs, stallboards, and in other situations. Sheringham ventilators, Boyle's mica-flap ventilators, and Howard's Archimedean screw ventilators, are among the variety of appliances shown at this stand.

Mr. T. W. Helliwell (Stand D 122), of Westminster Chambers, shows models exhibiting his patent method of glazing without putty, and his system of fixing zinc roofing without bolts or rivets.

The Hygienic and Sanitary Engineering Company (Bay 11), of Charing-cross, exhibit Mr. D. T. Bostel's well-known "Brighton Excelsior" water-closets in action.

Mr. E. S. Hindley (Stand 286, north side), of Bourton, exhibits vertical and horizontal engines well adapted to builders' use, besides circular and band saw benches of good construction and embodying the most important of recent improvements.

Messrs. C. Hindley & Sons (Stand D 135), of Oxford-street, exhibit two or three wooden mantelpieces, painted, together with some tasteful though inexpensive wall decorations, Japanese leather papers, &c.

Messrs. Hodgkinson & Clarke (Stand B 45), of Small Heath, Birmingham, are exhibitors of internal and external window shutters and fittings, blinds, &c.

Mr. Thaddeus Hyatt (Stand D 128), of Farringdon-road, makes a good display of his prismatic pavement lights and lens lights for floors, roofs, stairs, stallboards, and other situations.

The Indestructible Paint Company (Stand E 171), of Cannon-street, exhibit samples of their materials and of the effects of their application to various purposes.

The Imperial Stone Company (Stand D 130), of East Greenwich, exhibit the capabilities of their material as applied in the form of sinks, steps, paving, window-sills, lintels, copings, and curbing. They also show specimens of silicated stone water-pipes, samples of "petro-silicon" for paving stables, cow-sheds, railway platforms, &c., and a hollow curb for facilitating the laying of telegraph and telephone wires in streets.

Messrs. George Jackson & Sons (Stand D 131), of Rathbone-place, exhibit some very good specimens of ceilings and cornices in patent fibrous plaster, and some wooden chimney-pieces and over-mantels in the mode of the day, with applied ornament. Among the columns exhibited is one of those made by the exhibitors for the new Ball-room at Sandringham, from the designs of Mr. R. W. Edis, architect. It is a good specimen of modelling, and the ornament on the lower part of the column is of very pleasing design.

Messrs. Jeffrey & Co. (Stand D 134), of Essex-road, Islington, make a display of their non-arsenical wall-papers, many of which are of good design and colour. The central decoration shown is an Italian damask design, by Mr. W. Scott Morton, and is worked in shades of flocks on a fine pattern printed in reds on a talc ground.

Mr. George Jennings (Stand C 102), of Stangate, exhibits a variety of buff terra-cotta door and window dressings, string-courses, air-bricks, &c. He also shows an ingenious arrangement of speaking-tubes combined with electric bells, and apparatus for warming and ventilating churches, schools, hospitals, and other large buildings. But these are only among the incidental exhibits, the contents of

this stand consisting mainly of baths, lavatories, water-closets, and sanitary fittings generally. Most of Mr. Jennings's specialities are too well known to need description, but in calling the attention of visitors to the merits of his display in general we would especially mention the bath and bath fittings which are shown in action, and the automatic concealed urinal in mahogany case, with self-flushing arrangement, well suited for use in situations where a convenience of the ordinary type would be inadmissible.

Messrs. C. Kite & Co. (Stand E 149), of Chalton-street, show their well-known inlet and exhaust roof-ventilators, including a new application of the same to turrets of any architectural design.

Messrs. W. H. Lascelles & Co. (Stand 290, North Side), of Bunhill-row, are, as usual, strong in concrete work. Their principal exhibit is a Corinthian portico of buff concrete for a new Wesleyan chapel at Lynn, Mr. J. Hatchard Smith, architect. Another important exhibit is a large multilioned window in red concrete for the new wing of the Hospital for Diseases of the Chest, City-road, Mr. John O. Abbott, architect. Some wooden chimney-pieces and over-mantels of unpretending design, and a pair of well-made teak entrance-doors, are among the other exhibits of Messrs. Lascelles & Co.

Messrs. T. Lawrence & Son (Stand B 46), of Bracknell, are exhibitors of a small red brick structure exemplifying the way in which their bricks lend themselves to the carving of the now-prevalent "swags" of fruit and foliage. The carving has been done by Messrs. C. S. Kelsey & Son, of Robert-street, Hampstead-road.

Messrs. Lewis & Lewis (Stand 268, South Side) exhibit a large variety of useful plant for carpenters and builders, including the "Anerley" patent combined circular and band-sawing machine, the "Westminster" hand-fed planer, the "Kensington" mortising and boring machine, several other kindred machines, besides an improved friction hoist and an automatic plane-iron grinder.

Messrs. W. H. Lindsay & Co. (Stand B 39), of Paddington, show their reversible stair-treads and their patent steel decking for railway and road bridges.

The Madeley Wood Company (Stand E 168), of Ironbridge, make a good display of Broseley roofing tiles, ridges, and finials, all of good quality. They are also exhibitors of buff facing-bricks.

Messrs. Malkin, Edge, & Co. (Bay 6), of Burslem, exhibit a variety of encaustic and glazed tiles.

The Mangotsfield Pennant Stone Company (Stand B 44), of Bristol, show their stone, which is claimed to be particularly suitable for street paving, being as hard as granite, and affording a better foothold.

Mr. John Matthews (Bay 24), of Weston-super-Mare, exhibits Poole's patent bonding-roll square-cornered roofing tiles, which, it is claimed, are proof against wind-stripping and rain-dripping.

Messrs. W. F. Meakin & Co. (Stand D 139) show a full-sized model of a window fitted with their patent sash-fastener and opener. They also exhibit their oilable sash pulley.

Messrs. Messenger & Co. (Bay 13), of Loughborough, are exhibitors of horticultural buildings and appliances, besides boilers and other heating apparatus and an automatic cinder-sifter.

Messrs. Alex. McLean & Co. (Stand D 124), of Belvedere-road, Lambeth, make a display of their improved non-efflorescent Keene's cement, and of what is called "McLean's Decoration," which takes the form of embossed tiles or plaques of the cement in question, subjected to hydraulic pressure. The tiles can be made of any size up to 18 in. by 12 in., and, set in moulded panels of the same material, make a very effective wall and dado decoration, which can be coloured according to taste, and is absolutely fireproof and non-absorbent, besides being exceedingly hard and durable. The capabilities of this method of decoration are well shown in a series of panels designed by Dr. Dresser.

Messrs. Miller, Little, & Co. (Stand B 49), of Devonshire-street, Portland-place, show some well-painted tiles and glass panels.

Mr. Alfred Newman (Stand D 108), of Maddox-street, has an excellent display of exceedingly good wrought ironwork, domestic and ecclesiastical. A little way from his stall is erected a five-light lamp-standard, which is a remarkable

specimen of wrought-iron work—one of a series executed from the designs of Mr. F. B. Wade, architect, for the Duke of Westminster, and intended for the terrace in front of Eaton Hall.

Messrs. Newton, Chambers, & Co. (Stand 251, S.E. corner), of Thorncliffe Ironworks, Sheffield, are exhibitors of, among other things, the close and open fire cooking-ranges which constitute one of their specialities.

The Papier-Mâché Company (Stand E 180), of Wellington-street, Strand, have a good display of work in fibrous plaster, including a portion of the ceiling of the grand staircase of the Great Eastern Railway Hotel, Liverpool-street, executed to the design of Mr. C. E. Barry, the architect of the building. A number of panels and other details in papier-mâché and carton-pierre are also shown by this company, the excellence of whose work has been recognised for a great many years.

The Pennycook Glazing Co. (Stand C 101), of Glasgow, exhibit a model showing their method of glazing without putty, which is now becoming well known and largely used. It was described in our account of last year's exhibition.

The Phillips Lock-jaw Tile Company (Stand B 57), of Newport, Mon., exhibit Phillips's lock-jaw roofing tiles, single and double grip, which appear to be well calculated to afford security against dislodgment by wind.

Messrs. Piggett Bros. (West Gallery), of Bishopsgate-street, are exhibitors of tarpaulins, rope, and other articles in constant requisition by the builder, as well as of tents and marquee suggestive of shelter from wind and rain on the occasion of foundation-stone laying ceremonies.

The Pliable Wood Decoration Company (Stand A 5), of Wenlock-road, show specimens of dados, friezes, doors, and mouldings, decorated by their process, which is merely a very thin veneering, effected by special means.

Messrs. Quirk, Barton, & Co. (Stand C 96), of Gracechurch-street, show tin-lined lead pipe and sheet lead for water supply, cisterns, &c.

Mr. S. Ransom (Stand 277, West End), of Kensal-road, exhibits some good specimens of staircase work and hand-railing.

Messrs. Rendle Bros. (Stand D 136), of Westminster Chambers, exhibit their paint-remover, of the merits of which we spoke at length when it was introduced to the building trade more than two years ago.

Messrs. F. W. Reynolds & Co. (Stand 289, North Side), of Acorn Works, Blackfriars-road, have a large and varied display of wood-working and other machinery for builders' use, both for hand and steam power. Their new patent "General Joiner" is one of the most important of their exhibits, and appears to fully deserve its name,—the "Comprehensionist." This machine, which is shown at work, will plane two sides at once, work mouldings, try-up, square, rebate, chamfer, stop-chamfer, tongue and groove, rip, flat, feather-edge, cross-cut, bore and slot mortise, besides cutting tenons and shoulders, and doing a variety of other work. The machine is very compact; for, exclusive of the tenon and slot-mortising apparatus, it only occupies a space of 4 ft. 3 in. by 3 ft. 7 in. It should prove a great acquisition to many a small shop. In the new "Queen" combined circular and band-saw machine several improvements are noticeable.

One of them consists in so mounting the fly-wheel that it does not interfere with the operation of cross cutting. Besides a number of mortising machines, Messrs. Reynolds exhibit a new-pattern moriar-mill and steam-engine combined, so arranged that the mill may be disconnected, and the engine used separately for sawing, hoisting, or other purposes. Messrs. Reynolds also exhibit a large model of a silo, showing their patented appliances for compressing ensilage.

Mr. C. G. Roberts (Stand D 106), of Haslemere, Surrey, shows his rain-water separator (which we mentioned some months ago) in working action. Shortly stated, its object is to automatically turn the first rush of water from a roof (full of impurities as the water which first passes over a town roof must be) into a waste-pipe, and to conduct the clean rain-water into a place of storage. The apparatus is very simple in action, and should prove of great service for country houses and in other situations where it is desirable to collect the rain-water.

Messrs. F. Roshier & Co. (Stand 291, North Side), of Upper Ground-street, Blackfriars, exhibit a variety of useful and excellent goods.

including red and white Suffolk facing bricks, red and white diapered and moulded bricks, string-courses, paterno, &c., besides roofing and floor tiles in variety, ridges, finials, garden-edges, paving-bricks, &c.

The Rowlands Castle Brick and Tile Company (Stand F 202), for whom Messrs. F. Rosher & Co. are the sole agents, are exhibitors of red facing and moulded bricks of good colour, together with roofing tiles.

Messrs. J. Sagar & Co. (Stand 261, South Side), of Halifax, show a few useful machines for working wood.

Messrs. Salmon, Barnes, & Co. (Stand A 9), of Ulverston, show their revolving shutters and a self-sustaining lift.

Messrs. Shanks & Co. (Bay 10), of Barrhead, near Glasgow, are exhibitors of baths, lavatories, water-closets, and other sanitary fittings.

Mr. John Smeaton (Bay 11A), of Imperial Buildings, Ludgate-circus, is an exhibitor of bath and plumbing work, cast-lead "Eclipse" traps, and a hospital closet.

Messrs. H. Smith & Son (Stand F 205), of York-street, Lambeth, are exhibitors of patent bricks for facing external and internal walls. With these bricks it is easy to obtain a close joint on the face without decreasing the thickness of the internal bed of mortar. They will work in courses with ordinary stocks.

The Silicate Zopissa Company (Stand A 10), of Fish-street Hill, show samples of their composition for the protection of stone and other buildings from the action of town atmospheres.

Messrs. W. E. Smith & Co. (Stand 288, North Side), of Cremorne Works, Lot's-road, Chelsea, are exhibitors of some very useful wood-working machines, some of which we described at length last year. They are also exhibitors of "Bowers' Patent Separator" for purifying and softening water used for feeding steam boilers. By means of this apparatus the feed-water is heated to a temperature only 10° lower than that of the water in the boiler. The invention is intended to effect a mechanical precipitation of the mineral salts and other impurities existing in the feed-water, and to prevent their entrance into the boiler, so as to render the formation of scale impossible. This is an invention which should be looked at by all steam users.

Messrs. Archibald Smith & Stevens (Bay 2), of Queen's-road, Battersea, are exhibitors of self-sustaining single and double lifts, suitable for use in hotels, restaurants, and other large establishments. They also show a working model of Stevens and Major's patent hydraulic-balanced passenger lift, Russell's patent "Wonderful" self-feeding open fire-grate, and a number of other things which will well repay the attention of visitors.

Messrs. Smith & Turner (Stand A 17), of Bartholomew-close, exhibit their excellent adjustable double-action door-springs, some with a specially shallow box for use over iron girders, where little depth for sinking the box is to be had. Their water-bars, bolts, and catches for French casements are also worthy of notice.

Mr. J. Stannah (Stand F 211), of Southwark Bridge-road, shows a 5-cwt. hand-power "Southwark" lift, fitted with Stannah's patent safety apparatus. A smaller lift, to carry 1½ cwt., is shown. These lifts are provided with iron guides, which are light in appearance and take up less space than the old-fashioned wooden guides. The same exhibitor shows the "Southwark" lift gear and friction hoist, and the patent "Pendulum" pump.

Mr. Edward Story (Stand C 78), of St. James's-place, Gracechurch-street, exhibits specimens of the Gunnslake granite, a silvery material of a very fine and hard texture.

The Victoria Stone Company (Bay 28), of Kingland-road, exhibit several applications of their useful material.

Messrs. G. Waller & Co. (Bay 17), of Holland-street, Southwark, are exhibitors of penstocks, naphole flaps, gully-boxes, sewer ventilators, washing-boxes, and traps, valves, and tools of various kinds required in the construction or maintenance of a sewerage system. They also exhibit street "orderly" bins of iron, and dust-bins of the same material.

Messrs. Frederick Walton & Co. (Stand C 92), of Farners-street and Staines, are exhibitors of their well-known decorative material known as "Lincrusta-Walton," now so largely used as a wall decoration.

Messrs. S. H. Watkins & Co. (Stand D 127), of Brentford, exhibit various kinds of building materials and made-up articles, such as doors, stoves, &c.

Messrs. Waygood & Co. (Bay 15), of Falmouth-road, Great Dover-street, have a good display of their lifts, including their hydraulic-balanced passenger lift, a hand-power goods lift (with safety apparatus), and double and single dinner lifts.

Webb's Worcester Tileries Company (Stand D 141), of Rainbow Hill, Worcester, are exhibitors of a very good assortment of mosaic and encaustic tiles, good in texture and colour. They also exhibit their new printed under-glazed hearth and other tiles.

Messrs. Josiah Wedgwood & Sons (Stand E 178), of Etruria, Stoke-upon-Trent, have a very attractive display, including a number of Wedgwood jasper plaques, as used for chimney-pieces for the Earl of Aberdeen, and for string-courses, panels, and clock-faces for the Earl of Dysart. This historical firm are also exhibitors of impressed tiles suitable for hearths, jambs, and other uses. Visitors will find it well worth while to inspect the contents of this stand.

Mr. W. White (Stand 292, North Side), of Westminster-chambers and Abergavenny, exhibits his "Hygeian-Rock" building composition, which has been noticed by us in terms of commendation on previous occasions. Its name is intended to express both its sanitary value as a preventive of damp walls and its constructive value in point of strength. At the time of our visit on Monday two beams of brickwork, one of 14 in. work, and the other of 9 in. work, put together with this composition a few days previously, and each having a bearing of about 5 ft., were shown with loads of 12 cwt. and 6 cwt. respectively suspended from their centres, and the damp-resisting properties of the material are also shown under test.

The Willadsen Paper Company (Stand 294, North Side) are exhibitors of their patent paper and canvas for roofing and other purposes.

Messrs. Williams & Nash (Stand E 164), of Castle-street, Holborn, in addition to a variety of marble chimney-pieces, show a number of specimens of very beautiful Devonshire marbles, which are well worthy of inspection, as are also an old marble chimney-piece and a hall-table, removed from an old mansion at Clapham pulled down. These specimens of marble-masons' work of a few generations back are unpretentious and solid, and present a marked contrast to some of their cheap successors.

Messrs. Woollams & Co. (Stand D 137), of High-street, Marylebone, exhibit some excellent wall and ceiling papers, artistic in design, and guaranteed to be entirely free from arsenic. Dado decorations of various kinds, raised flocks for painting over, patent embossed flocks, and damask and chintz papers on mica grounds, are here to be seen in various styles and colours, some of them having been specially designed by Mr. A. Silver, Mr. A. F. Brophy, Mr. Bernard Dicksee, Mr. H. Noble, Mr. Owen W. Davis, Miss Louise Aumonier, and other artists. Messrs. Woollams & Co. also show the wall-paper designs of Messrs. Watts & Co. (Limited), for whom they are agents. These designs, we are told, were drawn and coloured by Messrs. G. F. Bodley, A.R.A., Thomas Garner, and G. Gilbert Scott. They also show a collection of patterns for wall and ceiling coverings, designed by Mr. John Aldam Heaton. Altogether this stand, as usual, is well worth the attention of visitors.

The Woolpit Brick and Tile Company (Bay 23), of Moorgate-street, exhibit red and white Suffolk facing bricks, of very good quality and colour, as well as white and red moulded bricks.

Mr. George Wright (Stand 167 E), of the East Acton Brickworks, exhibits an erection showing the capabilities of his bricks, which appear to be of excellent quality, and likely to show to even better effect in building on a large scale than they do in the miniature structure erected by Mr. Wright.

Messrs. Yates, Haywood, & Co. (Stand 245, East End), of Rotherham and Upper Thames-street, exhibit a large collection of stoves, kitcheners, railings, and builders' ironwork generally. They also display a number of cast-iron chimney-pieces and over-mantels in the prevailing so-called "Early English," "Queen Anne," and "Adam" styles. As specimens of casting they are, no doubt, very good and sharp, but here we may not have details of wood and stone construction (even to broken pediments and other eccentricities) reproduced in iron, but they are actually painted and grained to resemble oak and other woods, carvings and all!

Messrs. J. A. Young & Co. (Bay 2 A), of

Victoria-chambers, Westminster, are exhibitors of stable and manger fittings, which possess some desirable features.

We have now mentioned all the principal exhibits, but may possibly say more about some of them in our next.

NATIONAL STANDARD THEATRE.

The following are the alterations required by the Metropolitan Board of Works to be executed by the owners:—

1. That a proper proscenium-wall of brick, not less than 14 in. thick, be built to divide the stage from the auditorium, and that such wall be carried up to a height of 3 ft. above the roof, the height being measured at right-angles to the slope of the roof; that a brick wall, 14 in. thick, be built beneath the stage, in a line with the soffit of the proscenium opening, to divide the cellar under the stage from the space under the auditorium; that the existing wing walls be permitted to be utilised, so far as they are serviceable, in the construction of the proscenium-wall; that not more than three openings, each opening not exceeding 3 ft. wide and 6 ft. high, be formed in the proscenium-wall, exclusive of the proscenium-opening; that no openings be formed above the level of the stage, and that all openings in such walls be closed with wrought-iron doors not less than ½ in. thick in the panel, in wrought-iron frames, hung so as to close of themselves.

2. That the theatre be separated from all adjoining premises used as dwelling-rooms, stores, or for any purpose other than that of the theatre, vertically by brick walls, and horizontally by proper party structures, and that all openings between the theatre and such adjoining premises be stopped up with brickwork in cement the full thickness of the walls in which such openings are situated.

3. That the pit-stall entrance from George-street be made 6 ft. wide throughout, and be separated from the entrance to the dwelling-house adjoining on the east by a brick wall not less than 9 in. thick, and do have a ceiling formed of fire-resisting materials to be approved by the Board.

4. That the staircase from the balcony to the upper circle, and the pass staircase between the dress-circle and the upper-circle, be rebuilt; that the steps and landings of such staircases be constructed of solid toolled York or other approved stone, 4 ft. 6 in. wide, supported and enclosed upon all sides by brick walls not less than 9 in. thick, with arches turned under the landings and ceilings, formed of fire-resisting materials to be approved by the Board.

5. That the staircase from the ground-floor to the lower circle be rebuilt; that the steps and landings of such staircase be constructed of solid toolled York or other approved stone, 4 ft. 6 in. wide, supported and enclosed upon all sides by brick walls not less than 9 in. thick, with arches turned under the landings, and a ceiling formed of fire-resisting materials, to be approved by the Board.

6. That a brick wall, not less than 9 in. thick, be built on the north side of the staircase to the upper circle, to separate such staircase from the wardrobe and saloon adjoining, and that the gallery at the head of the lower circle staircase be enclosed on all sides by fire-resisting materials to be approved by the Board, or be caged in by wrought-iron bars, 1 in. square, placed 6 in. apart.

7. That the subterranean tunnel under the pit be blocked up, and that the wooden staircases leading to the same be removed, and the flooring made good.

8. That a new entrance from the street, not less than 4 ft. 6 in. wide, enclosed on all sides with brickwork or other fire-resisting materials, to be approved by the Board, be provided to the pit-stalls on the west side of the theatre.

9. That a new entrance and staircase be provided to the gallery on the west side of the theatre; that such entrance be not less than 4 ft. 6 in. wide, and be enclosed upon all sides with brickwork or other fire-resisting materials to be approved by the Board, and that such staircase be of similar dimensions and construction to the staircase described in Requisition No. 4.

10. That the passage-way between the houses Nos. 57 and 58, Holywell-lane, be cleared of all obstructions, and be made available as a means of exit, and that the openings in the wall on the west side be stopped up with brickwork the full thickness of such wall, and that such passage-way be separated from the premises under and over by floors of fire-resisting materials to be approved by the Board.

11. That the carriage-way adjoining the North London Railway be cleared of all obstructions, and be made available as a means of exit; that the openings in the walls enclosing the same be bricked up; and that such carriage-way be separated from the premises over by a floor of fire-resisting materials, to be approved by the Board.

12. That the scene dock on the west side of the theatre be separated from the North London Railway premises adjoining, by brick walls not less than 9 in. thick, and that any openings formed in such walls be closed by wrought-iron doors similar in all respects to those described in Requisition No. 1, or by revolving iron shutters.

13. That the pit refreshment-bar and pay-box adjoining be removed.

14. That a clear space, 3 ft. 6 in. wide, be formed around every part of the orchestra-stalls, pit-stalls, and pit.

15. That a clear space, 3 ft. 6 in. wide, be formed around every part of the upper circle.

16. That a clear space, 3 ft. 6 in. wide, be formed around every part of the gallery; that the seats in the angles of the gallery be removed; and the flooring made good, and of one level throughout; and that two gangways, each 3 ft. 6 in. wide, with steps of easy rise, be formed in the gallery, with stout handrails at the lower end of each gangway next the gallery front.

17. That the doors in the side walls of the entrance corridors out of Shoreditch High-street be rehung so as not to obstruct the passage-way.

18. That the doors to the private boxes be rehung so as not to obstruct the gangway.

19. That stout handrails be fixed on both sides of all staircases, steps, and landings where not already provided.

20. That the skylights in the roofs be protected by stout iron wire-guards.

21. That all doorways used by the public be made 4 ft. 6 in. wide, and that the doors be hung in two folds, and be made to open outwards.

WHERE IS THE SANITARY INSPECTOR?

UNDER the head of "Working Experiences," a Sanitary Aid visitor contributes the following to the last number of the *Charity Organisation Reporter*:-

"We may give a few details of two other cases still worse than any yet described, and which were visited by the Sanitary Aid visitor only yesterday.

A description of them is indeed hardly possible. The house, it may be premised, is a six-roomed tenement, occupied by six families. On entering a very narrow passage, the first thing that strikes you is the filthy state of the walls, the broken ceilings, the missing banisters, the unglazed windows of the staircase, and the generally dilapidated state of the house. But it is the water and privy accommodation which is the feature of this case. In a small court, 12 ft. by 10 ft., on to which the back windows all open, the state of things is as follows:-

The one small cemented brick cistern which supplies the closet supplies also the only source of drinking-water for twelve families,—those of this house, that is, and of the next. It is about 3 ft. long by 1 ft. 6 in. broad, and lies directly over the closet, with a pipe running straight up from the closet into it. It is covered in at the top with a lean-to roof of broken tiles, through which the rain pours in, washing down into the drinking-water the thick coating of soot and blacks which encrust the tiles within and without. The closet itself is in such a state of disrepair as to be scarcely useable, and a large pool of soil soaks perpetually all over the floor and into the court, as well as round into the adjoining washhouse, where, close to the ground, is the one drinking-water tap which supplies the house. The stench is simply unbearable. Add to this an uncovered brick dust-bin, full of offensive matter, and a heap of old bones and vegetables decaying in a corner. How the tenants have escaped cholera and typhoid passes all understanding. Up-stairs in one room was a poor woman suffering from a diphtheritic sore-throat and pains in her limbs. On the next floor a man had been ill ten weeks with a bad rheumatic attack. Another man had been removed to the infirmary. The next house was, if possible, worse, for there the only drinking-water supply was taken from a tap at the back of the closet wall of the last house, and from the same polluted source. The only closet for this house was quite unuseable, and in a state beyond description, so that six families had absolutely no accommodation whatever. The cistern over it had no tap, and the water leaked down the wall with a slow drip, adding damp to the fearful smell which made these two back courts simply a potential fever nest. The visitor came away feeling perfectly ill from only standing long enough there to note defects; and the poor tenants have to live and bear it, and pay 4s. and 4s. 6d. for a single filthy room, while the landlord, often as he has been asked, declines to move. It may well be asked, What are the inspectors doing?"

Books in the British Museum.—An evening paper says that the latest return of the number of volumes in the British Museum is just over 1,300,000. There are 160 miles of shelves, and about twenty more miles to be filled.

ROMAN MORTAR AND THE ITALIAN METHOD OF TREATING LIME CEMENTS.

Sir,—It is stated, on p. 360 of your number for March 15, in speaking of the way in which the Romans used lime mortar, that the lime was generally burned on the spot, and used fresh before cooling and crystallisation set in. Was this really the case? The inquiry is not made by way of cavil at an interesting article, but as a necessary consequence of the comparison of the statement in question with a wide and definite personal experience.

In Southern Italy, at the present day, the work of the mason and of the bricklayer is, as far as it is easy to ascertain, very closely what it was eighteen or nineteen centuries ago. Nor are the dates vague. Pompeii is an instance of indubitable Latin work, of which the latest, though not the earliest, date is certain. At Puteoli, again (or Pozzuoli, as it is now called), work of Roman date is extant. So it is at Capua,—speaking only of spots personally well known to the writer. Again, in the neighbourhood of Pompeii, skirting the romantic line of hills that form the southern bound of the beautiful bay of Naples, exists a tunnel aqueduct about 4 ft. high, now dry, but with a layer of sinter at the bottom that tells of its long continued use. It is held that it supplied Stabiae and perhaps Pompeii with water. In these and other instances that may be cited, it may be said that it is literary testimony that establishes the antiquity of the work. As far as material goes, in substance, shape, size, and mode of construction the ancient work is indistinguishable from that of the local masons of the present day,—admirable workmen as they are. So again with regard to "the large size, flat and thin" Roman bricks, of which the article correctly says that they "may be termed tiles, though used for wall building." The use of *mattoni*, as it is called, or brickwork, is rare in Southern Italy, as it is more costly than the ordinary tufa work. But it is at times employed,—and then the thin tile is used, precisely as in Roman times. These statements are not made second hand, or from a hasty tour, but are given from observations made during a residence of more than eight years in Italy, spent in close association with Italian architects.

The upshot of this investigation is, that the whole process of building, so far as can be judged from the comparison of ancient and modern work, being unaltered at least from the time of Pliny, it is fair to presume (in the absence of some very definite proof) that the treatment of lime for mortar is also unchanged. That treatment is the very reverse of being "used fresh." On the contrary, the Italian architects consider that the excellence of their mortar is in proportion to the length of time for which the lime has been slaked before using it.

On proceeding to commence a *palazzo* or other building, the first thing done is to dig a pit of size sufficient to contain the lime which it is anticipated that the building will require. This pit is then filled to within a foot or two of the surface with fresh lime, and the space left is filled with water. The water is, or ought to be, supplied as it evaporates, so as to keep the subjacent lime always in the state of a dense camp paste. It is dug out and mixed up as required, and if the first supply is exhausted more is added, but invariably treated in the same way, and the result is admirable. It is the opinion of persons competent to form conclusions of their own that the ease with which (in a climate that varies so extremely as to its hygrometric condition as does that of Italy, where the usually dry elastic air becomes painfully damp and clinging when the Sirocco blows over the Mediterranean) the walls of houses receive painting *al fresco*, is due to the mode of preparing the mortar; and this is all the more worthy of note because, if such be the case, it may be inferred that the grim and grievous failures which are but too well known in attempts at *fresco* painting in England, are due, not to our English climate, but to "daubing the wall with untempered mortar."

If it be asked for further testimony as to a method universally in use, at all events in Southern Italy, the inquirer may be referred to a paper on the limes and cements of Casale, Piedmont, and Liguria which is to be found in volume xv. of the Italian scientific journal, the *Giornale del Genio Civile*. In 1846 the Italian

Government instructed Signor G. Signorile to examine the limestones of the above-named districts with reference to their use on railways. It had been found that the lime which had been excellent so long as it was calcined with wood, deliquesced when calcined with coal, the coal in question containing pyrites. The experience of thirty years led to the conclusion that, for hydraulic lime, perfect calcination has to be effected in kilns of the ordinary construction, heated with wood, and fed from above. The tempering should be effected with the least quantity of water required to effect a stiff argillaceous consistency similar to that required for making bricks when tempered. The lime, the report goes on, should be kept under water, the temperature of which should be between 51° and 70° Fahrenheit, a necessary precaution in the case of experiments some of which lasted from six to twelve months or even more.

It is unnecessary to go into the details of these experiments. Every variety of limestone received attention, and one of the remarkable features of the case was the difference in the quality of the limestones from different beds in the same quarry. But in most cases the slaking was troublesome, as the limes increase in bulk but little when slaked, and, at certain temperatures, commence to soften before removal from the furnace. In these cases the change continues to go on very slowly, so that efflorescence takes place after use in building. It is to avoid chemical changes of this nature that the long process of slaking under a small head of water has in all probability been adopted.

In our own use of lime mixed when hot two inconveniences occur. It is, as we have seen, in order to avoid these inconveniences that the preliminary change in the lime, due to slaking, is made to occupy as long a time, and thus to proceed as slowly as possible, by the Italians. Without affecting too much precision of language, we may briefly characterise the evils to which we refer as being the one physical and the other chemical. That is to say, we have to contend with swelling and with deliquescence. As to the swelling, it is perhaps not so easy to speak positively in the case of the thin beds of mortar which are commonly used in brickwork. But in concrete the change of bulk is very perceptible. In new brickwork, again, the effect of deliquescence is most painfully apparent. Mr. Robertson, the author of a paper entitled "An Investigation into the Theory and Practice of Hydraulic Mortar," which was read before the Institution of Civil Engineers on 13th April, 1858, said that concrete had a tendency to swell when made of quick lime. He had tried the experiment and found that the swelling differed in extent in winter and summer. In summer, in a cubic foot, the concrete would swell one thirty-second in bulk; in winter only one forty-eighth. A paper on this subject, by Mr. Burnell, was read at the Royal Institute of British Architects in the session 1857-58, in which the use of quick lime in concrete was strongly condemned. When the extension of the London and Birmingham Railway from Camden Town to Euston was made, a layer of some 2 ft. 6 in. of concrete was placed in the foundations of the retaining walls. When the footings had been laid on this, and the plinths carried up a few courses, an iron bench mark was driven in at each pilaster. As the work was of an important nature, great care was taken with these levels, which were read, with a powerful instrument, to the 200th part of a foot, being double the usual degree of accuracy. Time after time, however, on checking the levels after three or four days, they proved wrong. The matter perplexed the resident engineer greatly, until it was found that the error was due to the swelling of the concrete, which lifted the retaining wall bulks on it. On going back over the whole series of pilasters, the differences were found to be correct, although there was a general rise of level above the bench mark from which the levels were started. Again, it was stated in the paper above quoted, that after grinding mortar for one hour, keeping it always at the same stiffness, it was observed with surprise that the quantity, instead of wasting, was absolutely beginning to swell, notwithstanding that the lime had been thoroughly slaked, and no increase of bulk from that cause was possible. A number of measurements are added to show that mortar arrives at its greatest density after one hour's grinding; and that when the grinding was carried on for ten hours,

the mortar lost half its strength, and gained 14 per cent. in bulk. The strong adhesion existing between cement and limestones, especially polices, has led to the idea, suggested by Mr. Burnell, that carbonic acid is absorbed by the cement from the stone itself. This view was supported by the experiments of Mr. Robertson, who also distinguishes between the hardness acquired by the mortar in the process of setting, and the further induration due to lapse of time.

Mr. Rendel's practice, it was mentioned in the debate, resulted in the rule to slack hydraulic lime with 33 per cent. of water, and to keep it for ten days. Roman and other ancient mortars, Mr. Robertson observes, owe much of their excellence to the slow absorption of acid; and it is, he adds, "unreasonable to suppose that the mortar of modern engineers will prove inferior to those, as it is undeniable that the theory is much better understood now." The nature of chemical action is, no doubt, better known now than could be the case before the time of Dalton. But that is quite a different thing from saying that we know better how to make mortar. Nor is it so certain that Time could do so much, unless the start be made in the right way. In some old buildings the mortar is in a very disintegrated condition, while in others it has consolidated into something like a geological rock. It is, at all events, conceivable that the bad mortar was not slaked, and that the consolidated mortar, as in the case of Roman relics in Italy, and even in England, owes its existence to the new process of the Italian mortar-makers.

At all events, it is clear from the above-cited authorities, that not a few points ordinarily neglected have very great influence on the excellence of mortar. The character of the limestone used has, in the first place, of course to be regarded. But good lime can be made from so many various kinds of limestone, that the greatest care in selecting, not only the quarry, but the bed of the quarry, is only one element of the supervision to be exercised by the architect.

Next, attention has to be called to the mode of calcination, and in this it is clear, from the experiments of Signor Signorile, we have to regard not only the kiln, and the mode of firing, but the fuel. Has this been regarded aright with us? To say nothing of wood, is it not the cheapest and thus the least pure coal that is ordinarily employed by the lime-burner? That the excess of sulphur thus rendered possible may be fatal to the excellence of the mortar is not only a theoretic possibility, but, in some cases at least, an established fact.

Then comes the question of slaking, which it is not, perhaps, easy to distinguish from that of grinding. In the case cited, where the continuance of the latter process for ten hours exercised an injurious effect upon the mortar, it is probable that hot slaked lime was used. The experimenter thus tells nothing as to the degrees of comminution or of mixing that may be desirable with slowly-slaked lime. As to this, Italian practice and Italian theory are at one. Nor does there seem to be anything irrational in the idea that undue haste in the commencement of a series of chemical processes which are to extend, not only over days, but over years, may be pernicious. To set a brick or a stone in a bed of mortar, and to leave the result to time, is all very well. But even Time himself demands fair-play, if he is to be a consolidator rather than a destroyer. A difference has been pointed out between the two processes of "setting" and of indurating, although one of these passes, or ought to pass, insensibly into the other. It is conceivable that the rapidity with which the slaking process has been effected, or the short time given to the slaked lime in which to accommodate itself to its new chemical condition, before it is called upon to enter on a new series of combinations, may have much to do with its subsequent behaviour. Such, at all events, is the opinion, and such is the practice, of the most ancient and most famous school (save one) of European architecture. Is not this worth the serious attention of the British architect?

It is suggested that it would be well worthy the reputation of the Royal Institute of British Architects to encourage a thorough and systematic investigation of the subject. Materials exist for forming an opinion. Some of them are above indicated, and their investigation will open the way to yet further facts. It can hardly be said that our knowledge of the

practical chemistry of mortars is absolute. It is, perhaps, unnecessary to illustrate this fact. It is certain that the manner in which mortar is used by the Italian builder is very different from that common with ourselves. Is it a difficult matter with us to take up a few courses of newly-set brickwork? When does the adhesion become so perfect that the brick will yield before the mortar? In Italian building adhesion is much more rapid and complete. No doubt much is often due to the presence of that admirable material *pozzolana*. But this, though a common and valuable, is not a universal, element in Italian mortar. In many cases where hasty building is desirable, as after partial demolition from earthquake, lime taken from such pits as have been described is used pure, or nearly so. It is better not to speak without citing chapter and verse as to the exact proportion of *pozzolana*, sand, or other materials mixed by the Italian builders with their lime. The proportions differ, from the rudest kind of masonry,—which is used in Italy where in England we use wood, as in forming the centre for an arch,—to the finest *scagliola*, or the impervious mortar which forms the flat roofs of so many important buildings, a mortar which is beaten with heavy clubs for ten days or a fortnight incessantly, in order to consolidate it. In the *scagliola* with which the interior of churches is often adorned, and in the "battuto" work of the terraced roofs, we have examples of the use of lime cements of a nature quite unknown in this country. The plaster of a modern English villa is usually perishable. Not so with these Italian applications of mixtures, alike, or very closely so, in ingredients, but wonderfully different in mode of manipulation from our own lime cements and plasters. What would our English builder think if he was obliged to detail four men to beat a roof or a floor for ten days or a fortnight? But this is an essential part of the erection of a good palace in Southern Italy; and woe to the ears of the neighbours while it goes on! The noise of the beating is bad enough, hour after hour. The men usually sit on very low rush-bottomed chairs, and use a wooden club some 3 ft. long, and 4 in. or 5 in. square, with a bent handle. A perpetual hammering from three or four of these implements is bad enough; but it is nothing to the fearful howls with which the work is usually accompanied. Evil will be the memory of any one who should introduce into England such an addition to the noises of our cities! But that notwithstanding, the results produced by the Italian treatment of lime are so incontrovertibly superior to those common in England, that it is hard to exaggerate the importance of a thorough investigation of the subject. F. R. C. March 19th, 1884.

THE "R.I.B.A."

SIR,—I was very glad to see that in your "Notes" of last week you condemned the attempt of some (so far) nameless persons to form an opposition society to the Institute, and I feel sure all the thinking and sensible members will fully endorse such condemnation.

Referring to the letter from Mr. Aitchison, I quite agree that what should be aimed at is to take every possible measure to get those who "now stand aloof to enrol themselves," and thus make the Institute not only a corporate body, but a really thoroughly representative one.

The letter from Mr. McLachlan [p. 424, ante], I think, is one which deserves the thanks of the members, as it brings before them facts which probably were either unknown or forgotten by many, more especially the extracts from the reports of the Council in 1837 and 1849.

I cannot think that any good reason can be given for not giving so large a body as the Association now are a vote, or at any rate a proportionate one. I apprehend that the only difficulty would be the alteration of the charter, and, as Mr. McLachlan shows, this requires alteration on more points than one.

Were this done, there would be a good hope of making the Institute what all must agree it should be, a thoroughly representative body.

I hope that all members will take the present opportunity of showing what I am convinced they feel, by expressing their views, and so show the Council what their "constituency" wishes, and I feel confident that if this be done the Council will not only "consider" the matter, but will be induced to bring forward a scheme which would meet the much-needed reform. G. A. PAYCE CXXSON.

MECHANICAL AIDS TO SCULPTURE.

SIR,—As this subject seems to have attracted some interest, will you allow me to add something to my former letter? Referring to the remark of Mr. George Simonds in your issue of March 1st (p. 320), that the sculpturing machine invented by Watt was abandoned by him, I think if he will inquire he will find this is hardly so, as, in the first place, Watt used the machine simply for his own amusement, and both the machine and some of the busts and bas-reliefs produced are still to be seen.

No one will deny that to make a successful sculpturing machine certain mechanical difficulties have to be surmounted; but, given time and unlimited money to work it out, I am one of those that believe almost any process may be imitated by mechanical means. Although there may be considerable difference of opinion,—in an art sense at any rate,—as to the advisability of reducing sculpture, when possible, to a mechanical process, much can be said on the other side as to the gain occasioned, in the art-education of the masses, by the reproduction by mechanical means of standard examples at a nominal cost; or, at any rate, by allowing machinery to do all the rough work, leaving the artist to give the finishing touches, and endow the bust or statue with "artistic merit."

The best known machinery designed for carving and sculpturing is that patented by Mr. Jordan, of London, in 1845, and a variety of machines, based on this patent, have since been constructed. It was designed for carving and copying irregular forms in wood or stone; the material to be shaped, and the model, were fixed on a horizontal table running on wheels transversely on another table or frame, which was arranged to move in a longitudinal direction, so that by the straight-line movement in two directions the table could be made to have a motion in every part of its iron plane.

The model and material to be shaped were made to swivel on centres, and so arranged that by means of a lever each could be turned simultaneously on its axis. The cutters were carried on a vertical slide; this vertical slide was raised or lowered to the work, which was fixed on the travelling table beneath by means of a trestle. A tracer guide acting on the model produced, by the aid of the cutters, facsimiles in the piece or pieces of material. Referring to stoneworking machinery generally, which, owing to ever-increasing competition in building construction, is now beginning to attract the attention it deserves, I can show those interested a machine that will cut architrave mouldings, cornices, ovolo, pilasters, astragals, ogee, scotias, strings, and other straight and curved undercut mouldings, panels, recesses, &c., and finish them in every way superior to, and at an immense saving over, hand labour. M. POWIS BALE.

ANCIENT LIGHTS.

SIR,—I have been reading Mr. Banister Fletcher's book on ancient lights, and am struck with the following two cases, which, although so much alike, have received opposite decisions. Can you or any of your correspondents explain the same?

The first case, p. 16, of his book is:—

A has two plots, b and c. He sells b to B, who puts windows in his house overlooking c. Subsequently he sells c to C. C blocks up B's windows. Judge rules that C has no right to block up B's windows.

The other case, p. 18, is:—

A possesses two plots, b and c, and sells b to B and c to C. c has windows overlooking b. C contends that although his windows are not ancient, yet that A expressly or impliedly reserved these lights when A sold b to B. The judge ruled that C was not entitled to an injunction against B when B blocked up C's windows. IGNORANS.

COMPETITIONS MEMORIAL COMMITTEE.

SIR,—May we, through the medium of your paper, request all who subscribed to the Street Memorial, and all other architects desirous of aiding reform in the principle then advocated, to sign the form sent to them and return it to us at their earliest convenience?

Over 1,000 signatures have been received to date.

COLE A. ADAMS, } Hon. Secs.
ASTON WEBB, }

14, Holden-terrace, Grosvenor gardens,
London, S. W., March 27th.

SMOKE ABATEMENT.

SIR,—I shall be glad if you will allow me to notice Mr. Edwards's letter under above heading, only to point out that the statements and charges he makes against the Smoke Abatement Committee's tests were refuted in the *Builder* of the 24th and 27th of March, 1883, as well as in the other journals to which he wrote.

Mr. Edwards's object in writing at that time was evidently an endeavour to invalidate the tests generally, because his own grate failed in the competition with grates of all sizes, tested under precisely similar conditions to his own. The statements he then made were proved to be absolutely incorrect, and his reasoning to be fallacious. He now appears disposed to renew the endeavour, and to his former improper treatment of the matter he now adds the distinguishedness of omitting to inform the public that he is the inventor of the grate he recommends, and he puts forward the name of Messrs. Benham & Sons, who make his grates, instead of his own. This seems to be treating both your readers and yourself with such bad faith, that it may perhaps be usefully exposed.

W. R. E. COLES.

National Smoke Abatement Institution,
44, Berners-street, W., March 25.

ASYLUM COMPETITIONS.

SIR,—Allow me to state, in answer to "A.R.I.B.A.'s" letter in your number of the 22nd inst., that the competition to which he refers was arranged in two series, according to what appeared to be the prevailing opinion as to competitions, as expressed at the meetings of the Institute.

As to the design of the successful competitor I reported that, although it carried out the detailed requirements of the Commissioners generally, yet that in an important point it would have to be altered before it received their sanction.

The same observation would have applied with greater force to the other designs submitted, although many of them showed great care and talent.

In my report I pointed out the chief causes of failure.

March 25, 1884.

THE ASSESSOR.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—As an old subscriber to your paper, which is always open to ventilate grievances, and also as a loyal member of the Institute, I ask you to draw the attention of the Council and the profession to what I consider a serious grievance and monopoly sought to be enjoyed by the Fellows only. This opinion I may say is shared by many of the profession with me. I refer to the "Conditions of Contract prepared by the London Builders' Society on the basis of headings sanctioned by the Royal Institute of British Architects." Clause 20, page 3, is the reference clause, and it winds up:—

"Architect, or in the event of his unwillingness to act, then of . . . architect, or in the event of his death or unwillingness to act, then of an architect being a Fellow of the Royal Institute of British Architects." &c.

There is a footnote that "the Council of the Royal Institute of British Architects require that the blank should be filled in with the name of a Fellow of the Institute."

Considering that there are in London and neighbourhood 236 Fellows on the list of members, and 457 Associates, and some of the latter, being men of large and varied experience, who probably do not aspire to anything more than being Associate members, and also that there are among the Associates a considerable number of gentlemen practising as quantity surveyors, it seems most unreasonable and unjust that the Council should debar Associates from taking references (where their form is adhered to it precludes them) in cases of small disputes; where knowledge of measuring and prices is indispensable, it is only reasonable that the surveyor should be the referee in preference to the architect. Moreover, if referred to a Fellow, it increases the cost of a reference twofold:—1st, the charges made by a Fellow on reference would be more than those charged by an Associate; and 2ndly, in many cases the Fellow would have to call in a measuring assessor; whereas, if an Associate acted, probably he would determine, by measuring himself, any differences.

The builders in London probably receive considerably more work in the aggregate from the 457 Associates than they do from the 236 Fellows. Many of the latter do not practise.

The consequence of this is that a considerable number of Associates and others in their conditions of contract put in clauses, leaving it open to select

any architect or surveyor that may be agreed upon; or, in many cases, each party nominates one arbitrator, and the two arbitrators select an umpire, independently of any connexion with the Institute. In some cases I have seen a member of the Institution of Surveyors inserted in the contract. This injures the prestige of the Institute, and takes away one of the privileges of being a member.

I have this day received a balloting list with twenty-two names, of which fifteen are to be chosen for the Council. What it is sent to me for I am at a loss to understand; as, on the other side, the first two lines distinctly say that Associates have no right to vote, or in any way to interfere, with the affairs of the society. I presume, therefore, the balloting-paper is useless to Associates. All I can understand that Associates can do is to attend meetings, read Transactions, and pay their subscriptions.

The number of Fellows is 408, and 685 Associates. Therefore, considering how much greater the latter number preponderates, surely the Associates should have some voice in the management of the society to which they so largely subscribe.

I write this in no capacious spirit of opposition (and know personally of no opposition society), but merely to call attention to matters which, now the election of a new Council is coming on, may probably induce them to offer some further privileges to Associates, and thus secure their increased loyalty and support.—"L'union fait la force."

A.R.I.B.A.

"A WOULD-BE ACADEMY STUDENT'S DIFFICULTIES."

SIR,—In answer to "Improbatus's" letter [p. 426, ante], asking for information respecting the drawings required for Probationers at the Royal Academy, members of the Architectural Association can borrow from its lending library Letarouilly's "Palaces of Rome" (which work has been sub-divided for the purpose into four or five parts, each with an important palace in it), Sharpe's "Parallels" (which has been similarly sub-divided), Pugin's "Examples," Pugin's "Specimens," and numerous other works, leaving ample choice to the would-be Probationer. If not a member of the Association, in one or other of the professional journals have been published from time to time numerous examples of measured drawings which can be inspected in the Library of the South Kensington Museum, the date of issue noted, and the back number of the journal purchased. The published plates are sufficiently clear to allow of their being enlarged; and, notwithstanding "Improbatus" being "convinced" otherwise, it is better to select ancient rather than modern examples of architectural design. The latter, however, are by no means disqualified, as evidenced by the fact that portions of the New Law Courts have been more than once sent in, copied from the published prints.

It is unfortunate that "Improbatus's" remarks were not confined to the above inquiries; his description of his reception by me is inaccurate. I do not snub those who are unfortunate enough to fail in being admitted. I am especially careful to avoid hurting their feelings or disheartening them from a further trial. It is no part of my duty to advise them at all, and I do so unofficially. In the instance referred to I fancy from the description that I must have advised "Improbatus" to obtain a copy of Sir Charles Barry's "Travellers' Club House in Pall Mall," edited by W. H. Leeds, a book costing a few shillings, and which I recommend to those who prefer Classic or Italian work. If I am right in this assumption, and "Improbatus" having copied the drawings therein contained, is unable to "help thinking that the fact of their being embodiments of a taste long since decayed," contributed to his failure, I am afraid he is mistaken; and it seems more likely that his want of success was due to his inability to recognise the beauty of proportion and refinement of detail of the building he was attempting to copy.

R. PHENE SPIERS,
Master of the Architectural School
of the Royal Academy.

WHAT'S O'CLOCK?

SIR,—About thirty years ago the Society of Arts gave 100*l.* premium for a shilling box of water-colours. This measure led to a complete revolution in art stationery, the good results of which are unbounded. I would suggest now that the same society give a similar premium for the best domestic clock that can be made and sold for 1*l.* A striking clock, of course. There is no medium of English make between a most expensive instrument and some eightpenny rubbish that loses or gains three hours a day, and finds its way to the dust-hole in about three weeks. German and American articles, after extinguishing the home trade, have fallen out considerably, and I hope the Society will give their serious consideration to this important subject, which would have the effect of reviving a most profitable and useful industry, and make it once more possible to answer the question at the head of this article.

WALTER SCARILL.

THE VENTILATION OF THEATRES.

SIR,—As some interest was excited in this matter by Mr. J. F. Seddon's paper a short time back, [pp. 225, 282, ante] it may be worth while to recall the fact that, thirty to forty years since, the Haymarket Theatre, then under the management of the late Mr. Benjamin Webster, was warmed and ventilated by the late Mr. J. Sylvester, C.E., of Great Russell street, Bloomsbury. As I was in the employ of Mr. Sylvester at the time, and partly superintended the execution of the work, I have a pretty good recollection of all the circumstances.

The heating (hot-water) apparatus was placed under the pit, and the warmed air distributed by numerous flues to all parts of the house; the ventilation was effected by the opening over the centre chandelier, which was covered, above the roof, with a louvred shaft in which was fixed a semi-cylindrical revolving shield, with a vane on the top to keep the open side to leeward. I forget the sectional area of this ventilating-shaft, but recollect perfectly that it was considered essential that the area of the fresh-air inlet should be largely in excess, so that no sensation of draught should be experienced.

When the works were completed, one of the contractor's labourers was employed to manage it, and I personally watched the effect almost nightly for several weeks after, during which time very few complaints were made.

Some time after, however, possibly in the following season, I am not quite clear as to this, coming was made to Mr. Sylvester that the heating apparatus did not warm the house, and that in consequence the external openings for the admission of fresh air had been closed, necessarily destroying the ventilation. I was sent to inquire into the cause of this, and found that the man left in charge had been dismissed to save expense, and that one or another of the regular staff was supposed to attend to the fire, the result being that, as it was nobody's business, it was entirely neglected. On reporting this state of things to the then treasurer, who also called himself a civil engineer, I was met with such a torrent of vulgar abuse, that I left the house, and have never been in it but once since.

It may be that theatrical managers are now more anxious to provide for the comfort of their patrons, but certainly my experience was not encouraging.

C. F.

RAILWAYS.

SIR,—What is meant by a "mile" of railway in the comparison table of your interesting article on M. Picard's book (p. 397, ante)? Are single lines and lines of four ways, six ways, and more, all reduced for comparison to line of double way?

* In both the French and the English railway returns the mileage is stated per mile of line open, irrespective of the number of tracks.

A CLAIM FOR "EXTRAS."

BRUNSDEN V. STAINES LOCAL BOARD.

In this case (tried before Mr. Justice Mathew) the contractor made a claim for certain extras. The architect of the Staines Town-hall, Mr. John Johnson, certified the amount which he considered to be due, and the builder presented the certificate and obtained a cheque. Some months after he brought an action for the amount of the items which the architect had struck out, and the learned judge gave his decision in favour of the defendants.

Mr. Sergeant, of Westminster, measured for the builder; and Mr. Henry Lovegrove for the Local Board.

PROVINCIAL NEWS.

Cardiff.—The first sod of the Llanishen Reservoir of the new Waterworks extension was cut on the 14th inst. by the Mayor of Cardiff (Mr. Bird) with a silver spade presented to him by the engineer. The storage reservoir, which is situated four miles from Cardiff, and will be capable of holding 300,000,000 gallons of water, is part of an extensive scheme for supplying Cardiff with water direct from Taff Fawr on the Brecon Beacons. The total cost of the undertaking is estimated at 300,000*l.*, and includes a 24-inch gravitating main from Taff Fawr to Llanishen, the construction of compensation reservoirs on the line of route, and the storage reservoir at Llanishen. The works were designed by Mr. J. A. B. Williams, A.M.I.C.E., of Cardiff. The contract for the Llanishen Reservoir is let to Messrs. Hill Bros., of Beckenham, for 53,000*l.*; the contractors' engineer is Mr. J. C. Dudley, and the clerk of the works is Mr. J. T. Jones.

Cambridge.—The memorial-stone of a Working Mens' Institute, at Castle-end, Cambridge, was laid on the 6th inst. by Professor Stuart, of Trinity College. The building will be in the English Domestic style of architecture, with

millioned windows and a high-pitched, open-timbered roof, covered with Bangor slate. There will be two class-rooms at the north end. The scullery, soup-kitchen, and lavatories will be on the west side. The whole is faced with red Suffolk bricks, relieved by Bath stone dressings. The cost will be between 600l. and 700l., exclusive of furniture. Mr. Henry George Bishop, Cambridge, is the architect, and Mr. G. J. Newman is the builder.

Darlston.—Mr. John Thornhill Harrison, C.E., Inspector of the Local Government Board, has been holding an inquiry at the Local Board Room, Darlston, into the merits of an application made by the Local Board for sanction to a loan of £22,500 for sewerage and works of sewerage disposal. The Clerk explained to the Inspector the grounds of the application. The Board sought to borrow £22,500, but, having regard to the fact that a portion of the land had been dispensed with, the amount *pro rata* could be reduced, so that it would not be necessary to borrow the actual sum. The reasons for this application were apparent. Unfortunately, Darlston had been without a system of internal sewers; the only sewers they had were incompetent to deal with the present sewage; and another reason which had induced the Board to seek a road out of the difficulty in which they were placed was the fact that proceedings had been threatened by the Birmingham Corporation, and also by Messrs. Elwell, who claimed certain water rights in connection with the stream. But the Board hoped and believed that the scheme which was submitted on their behalf by Mr. E. Pritchard, of Birmingham, would meet with the approval of the Local Government Board, and would satisfy all parties who felt themselves aggrieved; and also discharge in every possible way the legal statutory obligations. The scheme included the sewerage of the town, and outfall works in Bentley-lane, near James Bridge. The items of cost were:—Sewerage works, 18,555l.; cost of land, 1,291l. 11s. 3d.; compensations, legal and other expenses, 1,850l. 8s. 9d.; making a total of 22,500l., the whole of which the Board believed would not be expended. The population of the town was 13,900, the rateable value 22,300l. 4s., and the loan debt only 400l. Subsequently, Mr. Pritchard described the details of the plans which he has prepared, and the inquiry terminated.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

March 14.—4,856, W. R. Cornell, Grays, Ornamentation of Bricks, Blocks, &c.—4,866, A. F. Garrod, London, Safety Ventilating Sash-fastener.—4,871, J. Telford and R. Philpotts, Liverpool, Window-sashes.—4,900, S. Chandler and J. Chandler, Ventilating Chimneys.—4,903, J. Munro, New Barnet, Glazed Shelter Wall and Frame.

March 15.—4,934, R. Adams, London, Window-sashes.—4,943, C. Cooper, London, Heating Baths, Cisterns, &c.—4,950, J. D. Garrett, South-wold, Earthen Closets.

March 17.—4,978, P. O'Connor, Wavertree, Spring Hinges.—4,997, T. Clayton, Ashton-on-Mersey, Ventilation.—5,014, A. J. Boulton, London, Venetian Blinds. Com. by J. Querre, Toulouse.

March 18.—5,049, E. W. Harcourt, Nuneham Park, Chimney-cowl.—5,057, A. E. Geesey, Manchester, Wooden Block Flooring, &c.—5,064, W. J. Ticklepenny, London, Fireproof Floors and Cellars.—5,072, W. S. Rosenthal, London, Eyes for stair-roads, curtain-poles, &c.—5,075, H. J. Hadden, London, Construction of Floors and Ceilings. Com. by F. L. Perrière, Paris.

March 19.—5,106, T. Caink, Leigh, Flushing Water-closets, &c.—5,108, B. Boothroyd and J. Doherty, Southampton, Sun Blinds.—5,151, J. Sewell, Knaresborough, Glass Roofing.—5,162, M. Merichenski, London, Holders for Stair-roads, &c.

March 20.—5,172, J. Watson, Torquay, Warming and Ventilation.—5,184, C. H. Wood, Sheffield, Window-sashes.—5,194, H. Hart, Ballymacarroll, Bricks.—5,205, J. M. Tall, London, Building in Concrete.—5,211, J. C. Bothams, Fisherton-Anger, Construction of Walls with Louvre Openings, &c.—5,212, S. Belham and J. D. Bellars, London, Fireplaces, Flues, and Chimney-tops.—5,222, J. C. Bothams, Fisherton-Anger, Chimney-tops.

SPECIFICATIONS ACCEPTED.*

March 21.—1,715, R. Stevens, Bromley, Three-bar System of Glazing.—1,852, W. Harding, Exeter, Glazing Greenhouses, &c.—3,457, J. Fraser, Arbroath, Astragals.—3,559, A. Waters, Croydon, Cistern Float-valves.—4,438, J. Miller, Glasgow, Ventilating Syphon Traps.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

* Open to public inspection for two months from the date named.

NOTICES TO PROCEED

Have been given on the Dates first named.

March 18.—5,391, J. Warhurst, London, Apparatus for excluding Draughts, Rain, or Dust from Hinged Doors, &c. (Nov. 15, '83).

March 21.—5,498, T. E. Bladon and W. Matthews, Birmingham, Ventilation (Nov. 17, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending March 22, 1884.

3,879, G. Maw, Brosely, Earthenware or Porcelain Tiles (July 7, '83, price 2d.).

The surface of the tile has designs engraved or cut upon it. (Pro. Pro.)

3,656, W. B. G. Bonnett, Portwood, Automatic Flushing Apparatus (July 25, '83, 2d.).

A float is pivoted in the tank at the desired level, and is counterbalanced, and to the lighter end is attached the discharge valve. As the water rises in the tank the float is made to assume a horizontal position, closing the valve. A ball-valve then fills the larger end of the float and sinks it, whereby the valve is opened and the flush is effected. (Pro. Pro.)

3,661, E. Jordan, Cardiff, Street or other Gratings (July 26, '83, 2d.).

The gratings are locked. (Pro. Pro.)

3,675, R. Martinez, New York, U.S.A., Mats or Floor Coverings (July 27, '83, 8d.).

These are made of slabs of wood joined together by vulcanised indiarubber, which also surrounds each slab.

3,685, W. A. Bonella, London, Fastenings for Folding-doors, &c. (July 27, '83, 6d.).

A tongue-piece is pivoted on the middle of the frame, and recesses are made in the meeting edges of the two doors, so that when one door is shut the set of shutting the other forces the tongue behind a plate in the first door, securing it thereby.

3,701, J. Davies, Llanfyllin, Chimneys, &c. (July 28, '83, 2d.).

In the chimneys are mounted a series of fans, which will be caused by the draught to revolve slowly at first, and afterwards increasing their speed as the draught increases. (Pro. Pro.)

3,716, H. Pataky, Berlin, Roof-covering (July 30, '83, 2d.).

A mortar is made of vegetable filaments, coal-ashes, and coal tar, mixed together with water, and the roof is coated with this. (Pro. Pro.)

3,718, B. D. Healey, Brighouse, Asphalte Apparatus (July 30, '83, 2d.).

This is an improvement on patents Nos. 2,733 of 1876, 4,297 of 1881, and 3,783 of 1882, in dispensing with the gauges therein mentioned. (Pro. Pro.)

3,740, T. W. Helliwell, Brighouse, Water-closets (July 31, '83, 6d.).

To prevent noxious gases returning to the closet-basin, a chamber is formed where the fall-pipe enters the main discharge-pipe, and the entrance to this chamber and the exit therefrom are closed by hinged flaps, which can be lifted by the flush and afterwards close themselves. A ventilating-pipe is also attached to this chamber. The pipes are made in two parts lengthwise and then joined together.

3,754, C. M. Tate, London, Ventilating, Heating, or Cooling the Atmosphere of Rooms, Houses, and Buildings (July 31, '83, 2d.).

Below the bend of an inverted syphon is a lamp, or ice, &c., as the air is to be heated or cooled, and the syphon is connected with the room, &c. and the external air, the circulation being effected by the heat or cold. (Pro. Pro.)

3,760, F. J. Austin, London, Automatic Flushing and Antiseptic Tank (Aug. 1, '83, 6d.).

The cistern is filled by a ball-cock in a certain settled time, and emptied by a syphon. Above the cistern is a tank for the disinfecting fluid, and a ball-valve in the centre of the bottom thereof is lifted by the rising of the water in the cistern, when a small portion of the fluid is discharged.

3,761, T. Griffith, Manchester, Stair-pads (Aug. 1, '83, 2d.).

The treads of the stairs are covered with thick felt placed under the carpet, to preserve the same.

METTINGS.

SATURDAY, MARCH 29.

Building Exhibition, Agricultural Hall. 10 to 10.

Royal Institution, Capten Abney, R.E., F.R.S., on

"Photographic Action considered as the Work of Radiation." (V.) 3 p.m.

MONDAY, MARCH 31.

Building Exhibition, Agricultural Hall. 10 to 10.

Surveyors' Institution.—Students' Proficiency Examination continues.

Society of Arts.—Professor W. Chandler Roberts, F.R.S., on "The Alloys used for Coinage." (Cantor Lecture.) 8 p.m.

TUESDAY, APRIL 1.

Building Exhibition, Agricultural Hall. 10 to 10.

Surveyors' Institution.—Students' Examination continued, and Associates and Fellows' Voluntary Examinations in Divs. II., III., IV., and V. (continued till Saturday, April 5.)

Institution of Civil Engineers.—Mr. William Foster, F.C.S., on "Experiments on the Composition and Destructive Distillation of Coal." 8 p.m.

Society of Biblical Archaeology.—(1) Dr. Chetznar on "The Life and Social Position of the Hebrew Women in Biblical times." (2) The Rev. A. Lowy on "Technological Terms (Hebrew and non-Hebrew) marking the progress of Ancient Culture." 8 p.m.

Society of Arts (Foreign and Colonial Section).—Mr. Robert Capper on "The Rivers Congo and Niger as Entrances to Mid Africa." 8 p.m.

WEDNESDAY, APRIL 2.

Building Exhibition, Agricultural Hall. 10 to 10.

Society of Arts.—Mr. Elijah Hoole on "The Dwellings of the Poor of Great Cities." 8 p.m.

British Archaeological Association.—The Rev. S. M. Mayhew, M.A., on "Tenby and the Cathedral of St. David's." 8 p.m.

Geological Society.—8 p.m.

THURSDAY, APRIL 3.

Building Exhibition, Agricultural Hall. 10 to 10.

Society of Antiquaries.—(1) The Rev. H. M. Scarth on "The Discovery of a Vault with Heraldic Tiles on the site of Myosin Barrow Priory." (2) Dr. C. S. Percival on "Some Deeds in the possession of Mr. A. T. Everett." 8.30 p.m.

Institution of Civil Engineers (Special Meeting).—Capt. Andrew Noble, C.B., on the "Heat Action of Explosives." 8 p.m.

Royal Archaeological Institute.—(1) Mr. J. Park Harrison on "Saxon and other early Sundials." (2) Mr. W. Vincom on "The Church of St. Michael at Fleam, Norwich, and its Monumental Inscriptions." 4 p.m.

Society of Engineers.—Mr. J. W. Wilson on "The Construction of the Exhibition Building of 1861, and of the Crystal Palace." 7.30 p.m.

Chemical Society.—8

Royal Institution.—Professor Tyndall on "The Older Electricity: its Phenomena and Investigators." (VI.) 3 p.m.

FRIDAY, APRIL 4.

Building Exhibition, Agricultural Hall. 10 to 10.

Royal Institution.—Professor T. G. Bonney, F.R.S., on "The Building of the Alps." 9 p.m.

SATURDAY, APRIL 5.

Building Exhibition, Agricultural Hall. (Last Day.) 10 to 10.

Architectural Association.—Visit to the Hampstead Congregational Church (Mr. A. Waterhouse, A.R.A., architect). 3 p.m.

Miscellaneous.

Building Improvements in Chancery-lane.—The Enrolment Offices on the west side of Chancery-lane, near the Holborn end, are at present undergoing reconstruction. The interior of the buildings is being completely rearranged, and for this purpose the walls dividing the several offices have to a great extent been taken down. Another story is likewise being added to the building. The alterations are being carried out by the Office of Works. On the opposite side of the lane extensive additions have for some months been in progress to the recently-erected blocks of buildings known as the Victoria and Courts of Justice Chambers, and these additional ranges are now almost finished, giving a frontage to Chancery-lane from the south boundary in Southampton Buildings of upwards of 200 ft. Still further additions northwards in the direction of Holborn will, however, shortly be carried out. These additions will absorb the premises of Messrs. Newton & Co., patent agents, which will be cleared away in a few weeks on Messrs. Newton & Co. removing to the new offices which have been erected for them in Bream's Buildings. Other premises still further northwards in the direction of Holborn have likewise been secured by the owners of the Victoria and New Courts Chambers, and the site is now being cleared for the purpose of still further additions being made to the Chambers. When all the works are completed these chambers will have a frontage to Chancery-lane of about 300 ft. in length, extending upwards of 100 ft. in depth into the east side of Southampton Buildings. They will occupy a ground area of about 30,000 ft., the five floors covering an aggregate floor space of nearly four acres, and containing between 500 and 600 offices and chambers.

Sanitary Institute of Great Britain.—

The following gentlemen have accepted the Presidentship of the Sections of the Sanitary Congress to be held in Dublin in the autumn:—Section 1. Sanitary Science and Preventive Medicine, Thomas Wrigley Grimshaw, M.D., Registrar-General of Ireland. Section 2. Engineering and Architecture, Charles P. Cotton, M.Inst. C.E., Engineering Inspector Local Government Board. Section 3. Chemistry, Meteorology, and Geology, Charles A. Cameron, M.O.H., Dublin. The Exhibition of Sanitary Apparatus and Appliances in connection with the Congress will remain open for three or four weeks.

Electric Lighting.—Tenders are to be invited from a limited number of French electric lighting companies for supplying lamps to light the Halles Centrales. Endeavours are being made to organise an exhibition of electrical appliances, &c., in Brussels. The Belgian Society of Electricians, the Town Council of Brussels, and the Union Syndicale of that town have all been asked to forward the project. The new Houses of Parliament in Cape Town are to be lighted on the Edison system. Mr. Hortsek left this week to superintend the fitting up of the installation.—*The Electrician.*

British Archaeological Association.

The eighth meeting of the session was held on the 19th inst., Mr. Thos. Morgan, F.S.A., in the chair. It was announced that the annual congress would be held at Tenby, when visits would be paid to many of the surrounding places of interest, including, most probably, St. David's. The progress of arrangements for holding an Exhibition of Antiquarian Objects in the Albert Hall, a portion of the International Health Exhibition, were detailed, and Associates were invited to contribute articles. Mr. Loftus Brock, F.S.A., exhibited a quaint Grès de Flandres jug of the seventeenth century. The Rev. C. Collier detailed the progress of the works for the new railway between Whitchurch and Fullerton, which have revealed several human interments, thought to be those of combatants after a battle fought 1001. The Rev. Alex. Taylor reported the discovery of the interment of a prehistoric man buried 45 ft. deep at Tilbury. Flint implements were found at the same time. Mr. C. H. Compton described a remarkable wooden figure of Mediaeval date recently found in Petticoat-square, in the City of London, at a great depth. The discovery of the hypocaust of a Roman building in Paternoster-square was reported by Mr. Patrick, and a great quantity of remains were exhibited, showing the whole arrangement of the structure, portions of the hot-air flues, and a pavement of common red tesserae. Large roofing-tiles had been used instead of bricks as a support for the paving above the pillars of the furnace. Mr. W. H. Cope described some fine specimens of German glass. A paper was then read by the Chairman on the landing-place of Caesar on the Kentish shore. After detailing the many theories that have been put forward on this subject, reference was made to Caesar's own narrative, and the importance of Haller's calculations dwelt upon. Assuming that the port of debarkation was Wissant, the "nearest way across" would have brought Caesar to Dover. Haller has shown that the tides must have taken him east of that port, and Caesar's description of the country points, therefore, to the locality near Deal as the landing-place.

The Statue of Charles I. at Charing-cross.

—Its story is singular,—almost as singular as that of the statue of the Merry Monarch himself, which loyal Sir Robert Viner, "Alderman, Knight, and Baronet," put up in the old Stocks Market. It appears to have been executed about 1633, by Hubert Le Scur, a pupil of John of Bologna, for the Lord High Treasurer Weston, who intended it to embellish his garden at Roehampton. By the terms of the commission it was to be of brass, a foot larger than life, and the sculptor "was to take advice of his Maj. (Charles I.) riders of great horses, as well for the shape of the horse and action as for the graceful shape and action of his Maj. figure on the same." Before the beginning of the Civil War, according to Walpole, the statue, cast but not erected, was sold by the Parliament to John Rivett, brazier, living at the Dial near Holborn Conduit, who was strictly enjoined to break it up. Rivett, whose "faith was large in time," carefully buried it instead, and ingeniously exhibited some broken brass in earnest of its destruction. Report further says that, making capital out of both parties, he turned these mythic fragments into knife and fork handles, which the Royalists bought eagerly as relics, and the Puritans as tokens of the downfall of a despot. In any case there is evidence to show that the statue was still in Rivett's possession in 1660, and it is assumed that it passed from him or his family to the second Charles. Strype says that he presented it to the king, which is not unlikely.—*English Illustrated Magazine.*

Archæology at the Health Exhibition.

—It has been proposed by the Council of the British Archaeological Association to hold an exhibition of ancient articles in the Albert Hall, as a part of the International Health Exhibition. These articles will be contributed by the Associates, and will be classified in a similar manner to the modern works, which will form the exhibition proper. Here will be displayed articles of the chase from remote to modern times, table art, articles of pottery of all ancient dates, and personal ornaments, so far as they relate to the objects of the exhibition. A good display of articles is expected, and already many of public interest have been promised. An influential committee has been appointed to carry out the undertaking.

The Telephone with reference to House Property.

—One of the most interesting problems in connexion with this wonderful instrument is that relating to the increased value of house property in back streets consequent upon the facility of intercourse allowed by the telephone. Merchants are beginning to realise that whilst it may be advantageous to have their counting-houses and offices in a front street, the store or factory may readily be hundreds of yards distant,—up a narrow alley it may be, but as readily accessible by telephone as it used to be by speaking-tube. In this way we are credibly informed that one large firm are saving over 1,000*l.* a year in rent by having their factory and stores in a place where hitherto rents have been low, and where a large building lay vacant. To the universal Provider, who deals in everything under the sun, and has hundreds of workmen employed in different classes of work, the telephone is invaluable. A lady customer writes to know when her dress will be finished; the assistant simply calls up the dressmaker who is superintending the workshop. It may be half a mile distant, but she at once knows how long it will be before the dress will be sent home. So with cabinet work, the foreman in the workshop is able in a minute to reply to any inquiry made at the counter, whatever the distance. It, therefore, is a matter well worth considering by the several vestries, whether any attempt to exclude their district from the benefits of the telephone may not prove in the end as disastrous to them as did similar attempts in the earlier history of railways to keep the railways away from the towns. The towns, and not the railways, have proved the sufferers, and it may be that the course of trade will follow the line of the least opposition, and workshops and factories will be established in those parishes where telephonic communication is the easiest. The problem is an interesting one, and well worth the consideration of owners of what may be called "back property."—*Postal and Telegraphic Gazette.*

Pier-work.—The sixth of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, jun., vice-principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of March 20, in the reading-room of the Society of Engineers, Victoria-street, Westminster; Mr. Perry F. Nursey, vice-president, in the chair. The lecturer began by speaking of the old form of open-timber pier-work, with its few recommendations and many disadvantages, and especially of the various causes of its deterioration and their remedies. After considering the driving in various ways of the different kinds of timber-piles, he proceeded to the subject of iron pier-work, drawing attention to the general mode of combination of wrought and cast iron in their construction, with the advantages and disadvantages of each, and to the different forms of iron columns and piles, and their different modes of sinking. Attention was next directed to the superstructure, the arrangement of bays and nests, diagonal bracing and lateral stiffening, deck and framing, deck structures, &c.; and the lecturer pointed out, by means of plans of existing structures, the variations which occur in pier-work as regards length, breadth, elevation, position, and form of head, concluding with some general remarks as to the position of piers and their cost.

The Regent's Canal and City Railway Company and the Barbican Station.

—When the Regent's Canal, City, and Docks Railway Company obtained their Act of Parliament some three years since, they entered into an arrangement with the St. Luke's Vestry for the purchase of the vacant land in Golden-lane, in order to build upon it their terminal station in Barbican; but the erection of a station on this site appears now to be doubtful. Up to the present time it seems that the railway company have failed to carry out their agreement with the vestry, and there is some probability that the site in question will ultimately be occupied by a Board School, the School Board having been in communication with the vestry for the purchase of the site. The Board, having inquired whether the vestry were prepared to sell the land for Board School purposes, the vestry have placed themselves in communication with the railway company, as to whether it is their intention to complete the purchase. Should the company decline to do so, we understand that the land will be sold to the School Board.

The Richmond Water Supply.

—A Local Government Board inquiry is to be held on the question of the Richmond water supply on April 3, when Major Tulloch will attend. It is to be hoped, in the interests of the ratepayers, that a searching investigation will be made into the circumstances of the sinking of the well, which, as far as favourable results go, appears to be an utter and complete waste of public money. By the last accounts, the well has now reached a depth of 1,334 feet, and all that is to be shown for it is a yield of water at the rate of 5½ gallons per minute. The contract depth for the Richmond sinking was 1,234 feet, and it has now therefore been exceeded by 100 feet. Wells sunk under similar conditions in the London basin, such as the Hampstead Company's artesian well at Kentish Town and the Meux Brewery well at Tottenham-court-road, were both discontinued at the depths respectively of 1,302 feet and 1,144 feet, it being the opinion of experts that it was useless to make any further outlay. It is true that in the Paris basin wells have been sunk of much greater depth than any of the London basin wells, such as that at Passy, which was sunk 1,913 ft. before water was reached. But however interesting the question is from a geological point of view, it must be remembered that for the last six years the water committee of the Richmond Vestry has been blindly working, and that an expense of more than 60,000*l.* has been incurred; and when it is considered that the Kentish Town well, which was unsuccessful, cost only 7,000*l.*, and even the Passy well, with all the indifferent appliances and scanty experience in the well-sinking of that day, cost but 40,000*l.*, it is not to be wondered at that the ratepayers of an already heavily-burdened town are becoming seriously uneasy about the aspect of affairs.—*Times.*

New Buildings in Drury-lane.

—Extensive new premises for Messrs. Leighton Bros., chromatic printers, are at present in course of erection in Drury-lane, to which they have a considerable frontage. The building immediately adjoins the north side of the disused St. Martin's burial-ground, which some years ago was laid out as a recreation garden. It has a frontage to Drury-lane 60 ft. in length, and contains four lofty floors, in addition to a deep basement, in which the machinery is intended to be placed. The elevation is 68 ft. in height to the apex of the gables at the north and south angles, the style of architecture partaking of a Gothic character. The base of the frontage is faced with Cliff's glazed brick and red terracotta. At the north and south sides of the ground-floor part of the frontage there are lofty Gothic arches springing from polished Aberdeen granite piers, the spandrels being filled in with Brown's ornamental brick. The upper portions of the frontage are faced with terra cotta and red brick. Each floor has a range of three-light mullioned windows. The surmounting gables at each end of the frontage enclose three-light Gothic windows, ornamented with Brown's moulded bricks. The building extends backwards upwards of 100 ft., and has an entire floor area of nearly an acre in extent. Messrs. Lander & Bedells, of John-street, Bedford-row, are the architects; and Messrs. James Brown, Son, & Bloomfield the contractors. Mr. W. Crossley is foreman of the works.

Clocks and Bells.

—Messrs. John Smith & Sons, turret clock makers, of Derby, have just erected in Churcham Church, near Gloucester, a large clock which strikes the hours upon a 17 cwt. bell, chimes the quarters, and shows time upon a 5 ft. dial. The same firm have also just finished a large clock at Boughton Church, near Northampton. Both clocks have all the latest improvements, and are constructed after the designs recommended by Sir Edmund Beckett, bart., Q.C. They are not expected to vary above two or three seconds in a week.

Hyde (Manchester).

—A reredos in mosaic, in memory of the late Mr. J. Horsfield, has been erected in St. George's Church, Hyde. There are three divisions; in the centre is a marble cross, surrounded by passion-flowers on a cream-coloured ground; the other two divisions are divided by the vine and corn from the centre, and contain, enclosed in circles, the heads of the four Evangelists on a gold ground. On the right and left are the figures of Aaron and Melchizedec in colour on gold grounds. The reredos was designed by Mr. T. W. Camm, and executed by Messrs. R. W. Winfield & Co., Cambridge-street, Birmingham.

National Expenditure on Paper and Printing.—The original estimate of the Stationery Office for the year expiring on the 31st instant was 539,110*l.*, or 10,000*l.* in excess of the sum similarly expended during the financial year 1882-83. The supplementary estimate now submitted for the same department represents a further sum of 30,629*l.*, thus bringing up the total disbursements of the Stationery Office to 569,739*l.* About two-thirds of the amount of the supplementary vote asked for is on account of the General Post-office and the Patent Office, the excesses being due to the introduction of the Parcels Post, and to the passing of the new Patent Act respectively. Let it not, however, be supposed that the afore-mentioned sum represents the total outlay of the Government on account of paper and print; for a number of Civil Service departments arrange for their own printing, independently of the Stationery Office; and their expenditure under this head may, broadly speaking, be put down as 243,000*l.*; thus giving a gross total of 812,739*l.* The import of these figures will be better realised when we mention that the civil administration of this country involves an expenditure on account of paper and printing nearly equal to one-third of the total national revenue of the kingdom of Great Britain.—*Printing Times and Lithographer.*

TENDERS.

For alterations to front of Local Board Offices, Beckenham. Messrs. G. B. Carlton, Assoc. Mem. Inst. C.E., engineer and surveyor.—

	Plan A.	Plan B.
Webb & Ross	247 10 0	235 15 0
Cuppled, Beckenham	475 0 0	283 0 0
J. Harpell, Shortlands	469 5 0	283 4 0
T. W. Jones, Beckenham	465 0 0	254 0 0
H. Leach, Shortlands	440 19 0	278 0 0
D. & A. Brown, Can-		
terbury	389 0 0	265 0 0
G. B. Marshall, Brighton	389 0 0	230 0 0
Engineer's estimates	350 0 0	175 0 0

For the erection of the northern two-story cage of the Liverpool Zoological Gardens (contracts 4 and 5). Messrs. Richards & Son, architects, Leek.—
The Everton Quarry Company, Liverpool, and Rutishon & Co., Clayton, Manchester.—22,850 0 0

For the erection of lodge, workshops, brick boundary wall, and iron fencing, to enclose the Woolwich Cemetery and additional lands, near Plumstead Common, for the Woolwich Burial Board. Mr. H. H. Church, architect, Woolwich. Quantities supplied.—
Kirk & Randall, Woolwich

For alterations and additions to the Old Bay Tree public-house, Vicarage-lane, West Ham, E., for Mr. W. Geary. A. Birt, architect, Peckham-rye. Quantities not estimated.—
Harvey, Peckham-rye

For rebuilding business premises in Castle-street, Hastings. Mr. A. W. Cross, architect, Hastings.—
Ariss (accepted)

For new bar fittings, &c., at the Old Golden Cross Inn, Hastings. Mr. A. W. Cross, architect.—
Ariss (accepted)

For the erection of a school chapel in Portland-street, South. Messrs. Bellamy & Hardy, architects. Quantities supplied.—
Martin & Sims

For erecting a pair of villa residences at Harpenden, Herts, for Mr. T. Elmes. Mr. J. R. Brown, architect.—
C. Mielken, St. Alban's

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For wings and additions to Cam Hall lane Board School, to accommodate 369 children. Mr. John T. Bressey, architect.—

Bottoms Bros., Battersea	23,836 0 0
C. J. Bartlett, Fulham Palace-road	2,823 0 0
D. G. Jones & Co., Gloucester	2,749 0 0
T. Russell, Forest Gate	2,630 0 0
J. Caley, Stratford	2,630 0 0
W. Greger, Stratford	2,677 0 0
W. J. Hack, Poplar	2,697 0 0
D. D. & A. Brown, Can-	
terbury	2,735 0 0
G. J. Hoskins, Forest Gate	2,733 0 0
A. Reed, Stratford	2,675 0 0
Harris & Wardrop, Limehouse	2,384 0 0
J. R. Hunt, Bow Common	2,315 0 0
Priestly & Gurney, Hammer-smith	2,294 0 0
J. J. Robson, Woodford	2,279 0 0
J. Brickell, Manor Park	2,150 0 0
F. Smith, London	2,015 0 0

* Accepted, subject to approval of Education Department.

For sewerage, levelling, paving, metalling, channelling, curbing, and making drains streets, at Ilkeston, Derby, for the Ilkeston Local Board. Mr. Charles W. Hunt, surveyor to the Board.—

John Cope, Ripley	2349 14 0
Beardley & Pender, Ilkeston	307 0 0
John Hawley, Ilkeston	303 13 8
William Gordon, Nottingham	239 0 0

* Accepted.

For new class-room to National Schools, Woodburn, Bucks. Mr. Arthur Vernon, architect, Great George-street, Westminster, and High Wycombe.—

Woodbridge	2334 0 0
Gibson	285 0 0
Silver	294 0 0
Lousley	277 17 0
Hunt (accepted)	267 0 0

For reinstating No. 65, Cornhill, after damage by fire. Mr. R. Willey, architect, 66, Ludgate-hill.—

Beatty	2380 0 0
Woodward (accepted)	600 0 0

For reinstating No. 138, Tabernacle-walk, Finsbury. Mr. R. Willey, architect.—

Holmes	2315 0 0
Beatty	490 0 0
Woodward (accepted)	425 0 0

For two new semi-detached houses, fronting the Green, Twickenham, for Mr. E. H. Brown. Mr. Thos. R. Richards, architect, 17, King-street, Cheshire, Quantities by the architect.—

Higgs & Hill	22,328 0 0
Slade	2,130 0 0
Sims	2,100 0 0
Boyer	2,075 0 0
Harris & Wardrop	1,994 0 0
Messom	1,993 0 0
T. & W. Nicholson	1,984 0 0

* Accepted, subject to modifications arranged.

For alterations and additions to "Dunraven," Ridgeway, Enfield, Middlesex, for Mr. G. Spicer. Mr. Rowland Plunbe, architect. Quantities not supplied.—

Fairhead	21,064 0 0
Goodman	1,039 0 0
Patman Bros.	968 0 0
C. F. Munn	967 0 0

For terrace of six houses to be built in the Norwich-road, Cromer, Norfolk, for the Cromer Hall Estate Building Company (Limited). Mr. Ed. Jno. May, architect. Quantities by Mr. E. C. Gledhill.—

Newman, Cromer	24,125 0 0
Bird, London	8,969 0 0
Weggy, Norwich	3,910 0 0
Downing & Son, Norwich (accepted)	3,721 0 0

For new shop-front and alterations to No. 105, High-street, Kensington, for Messrs. Derry & Toms. Mr. Josiah Houle, architect.—

Drow & Cadman	2778 0 0
Kearly	734 0 0
Spencer & Co.	725 0 0
Bowles	679 0 0

For new hospital for infectious diseases, Woodbridge, near Guildford. Messrs. Peak, Lunn, & Peat, architects, Guildford.—

Henry Ingram, Woking	23,328 0 13
Pearce & Clerk, Guildford	3,235 0 0
Garnett, Guildford	3,200 0 0
Mitchell Bros., Shalford	3,101 14 7
John Crook, Southampton	3,085 10 0
B. Pink, Milford	3,079 0 0
H. Lee & Son, Croydon	2,788 5 0
W. Smith & Sons, Guildford	2,698 10 0
Kingsley, Banbury	2,687 0 0
Bull, Sons & Co., Southampton	2,683 0 0
Martin, Wells, & Co., Aldershot	2,680 8 8
Forster & Dickens, Rugby	2,629 0 0
G. Strudwick, Guildford	2,627 0 0
P. Peters, Horsham	2,534 10 0
John Bottrell, Reading (accepted)	2,605 0 0

For widening, paving with Imperial stone and granite kerb and channel, as per schedule, a part of the High-street, Colchester, for the Corporation.—

C. H. Oldridge (accepted)	
---------------------------------	--

For new nurses' rooms, &c., for the Board of Guardians of the Whitechapel Union. Mr. W. A. Longmore, architect, 7, Great Alie-street, E.—

Lovely	21,630 0 0
Castle	1,547 0 0
F. & F. J. Wood	1,483 0 0
R. Raymer	1,450 0 0
M. Calman & Co.	1,445 0 0
Little	1,415 0 0
S. J. Scott	1,373 0 0
Palmer & Co.	1,369 0 0
McGee & Co.	1,367 0 0
E. C. Howell & Son	1,350 0 0
Page	1,339 0 0
W. Shurmer	1,287 0 0
Hawkins	1,287 0 0
Gladings	1,198 0 0
J. R. Hunt	1,158 0 0
W. H. Pyle & Co.	1,070 0 0

For house for Mr. W. H. Manser, at Newmarket. Mr. Wm. C. Manning, architect, Newmarket. Quantities by Mr. Bagg.—

Wilkes Bros.	22,698 0 0
Kinlimont	2,625 0 0
Brass	2,510 0 0
Jacklin	2,600 0 0
Holland & Hannan	2,589 0 0
Boyce	2,489 0 0
Nightingale	2,480 0 0
Lavrance & Sons	2,430 0 0
Dove Bros.	2,375 0 0
Bell & Sons	2,273 0 0
Thackray	2,189 0 0

For new training-establishment at Newmarket for Mr. C. Wood. Mr. W. C. Manning, architect, Newmarket. Quantities by Mr. Bagg. (Second competition).—

Warboys, Basingstoke	27,120 0 0
Wilkes, Buckingham Palace-road	6,998 0 0
Boyce, Eagle Works, Hackney	6,630 0 0
Prime, Cambridge	6,487 0 0
Tubey, Newmarket	6,464 0 0
Jacklin, Royston	6,474 0 0
E. Lavrance & Sons, W. War-road, N.	6,398 0 0

* Accepted.

For the enlargement of Wesleyan Mission premises, Gillespie-road, Backstock-road. Mr. F. Boreham, architect.—

Richards	21,290 5 0
Woodward	1,219 0 0
Shurmer	1,143 0 0
Holloway	1,083 3 0
Roberts	1,087 0 6

For the erection of two shops at Walthamstow. Mr. John Hamilton, architect.—

S. J. Scott	22,973 0 0
W. Shurmer	1,998 0 0
J. Harper	1,993 0 0
Reed	1,986 0 0
Fuller	1,891 0 0
Good Bros.	1,760 0 6

* Accepted.

For the erection of a school at Park-road, Greenwich, for the London School Board. Mr. E. R. Robson, architect.—

Staines & Son	29,777 0 0
W. Shurmer	9,750 0 0
Ferry & Co.	9,010 0 0
H. L. Holloway	8,980 0 0
H. Hart	8,979 0 0
Stimpson & Co.	8,979 0 0
W. Downes	8,978 0 0
W. Brass	8,938 0 0
Patman & Fotheringham	8,888 0 0
W. Scrivener & Co.	8,881 0 0
Lathey Bros.	8,840 0 0
G. Grover	8,840 0 0
C. Wall	8,829 0 0
Wall Bros.	8,815 0 0
Kirk & Randall	8,778 0 0
E. C. Howell & Son	8,736 0 0
S. J. Jerrard	8,633 0 0
W. Bangs & Co.	8,630 0 0
Atterton & Latta	8,600 0 0

* Accepted.

For the enlargement of school, Stockwell-road, Lambeth, for the London School Board. Mr. E. R. Robson, architect.—

E. & F. J. Wood	25,882 0 0
W. Shurmer	5,486 0 0
Kirk & Randall	5,294 0 0
J. Marsland	5,237 0 0
W. Downes	5,178 0 0
W. Johnson	5,108 0 0
W. Goodman	5,069 0 0
E. C. Howell & Son	5,034 0 0
W. Scrivener & Co.	4,998 0 0
Perry & Co.	4,958 0 0
J. Grover	4,963 0 0
Lathey Bros.	4,932 0 0
W. Brass	4,930 0 0
Wall Bros.	4,883 0 0
S. J. Jerrard	4,886 0 0
B. C. Nightingale	4,832 0 0
W. Bangs & Co.	4,824 0 0
J. Rider Hunt	4,808 0 0
Atterton & Latta	4,700 0 0
Stimpson & Co.	4,680 0 0

* Accepted.

For the erection of school at Fenton-road, Nine Elms, for the London School Board. Mr. E. R. Robson, architect.—

W. J. Mitchell	216,161 0 0
W. Shurmer	12,370 0 0
W. Scrivener	12,167 0 0
J. R. Hunt	12,123 0 0
W. Johnson	12,087 0 0
W. Brass	12,031 0 0
Wall Bros.	11,994 0 0
Patman & Fotheringham	11,979 0 0
Turtle & Appleton	11,978 0 0
W. Bissett & Son	11,850 0 0
Lathey Bros.	11,846 0 0
J. D. Hobson	11,844 0 0
J. Grover	11,735 0 0
C. Wall	11,643 0 0
B. C. Nightingale	11,631 0 0
J. Marsland	11,614 0 0
Kirk & Randall	11,610 0 0
Hy Hart	11,672 0 0
W. Tongue	11,514 0 0
Stimpson & Co.	11,500 0 0
W. Bangs	11,480 0 0
E. C. Howell & Son	11,467 0 0
W. Downes	11,444 0 0
S. J. Jerrard	11,443 0 0
W. Oldroyd	11,437 0 0
Perry & Co.	11,328 0 0
Atterton & Latta	11,300 0 0

* Accepted.

For rebuilding the Tulip Tree public-house, Kew Foot-road, Richmond, for Messrs. Thorne Bros. Messrs. Leo Bros. & Pains, Adelphi-terrace, architects.—

Parsons, Wandsworth	21,297 0 0
Carless & Co., Richmond	1,268 0 0
Lathey Bros., Battersea	1,180 0 0
Turtle & Appleton, Wandsworth	1,037 0 0

* Accepted.

For putting new galleries, &c., in Welsh Chapel, Sussex-road, Holloway. Mr. F. Boreham, architect:—
W. Goodmans £250 0 0
L. H. & K. Roberts 559 0 0
J. Holloway 545 0 0
J. Grover 544 0 0
Williams & Son (accepted) 537 0 0

For altering and repairing the Welsh Chapel, Stepney. Mr. F. Boreham, architect:—
Spencer & Co. £249 5 0
Richards 573 0 0
L. H. & K. Roberts (accepted) 484 0 0

For pulling down and rebuilding Nos. 53, 54, 55, and 56, Rathbone-place, and making sundry alterations and additions to No. 57, Rathbone-place, and No. 59, Oxford-street, for Messrs. Parkins & Gatto. Mr. Silvester C. Capes, architect, 18, Doughty-street. Quantities by Messrs. Karlake & Mortimer, 5, Great Queen-street, Westminster:—

Palman & Petheringham	£7,573 0 0
Stanley G. Bird	7,499 0 0
Fish, Prestige, & Co.	7,386 0 0
G. Bywater	7,143 0 0
M. Manley	7,100 0 0
W. Scrivener & Co.	6,988 0 0
B. Nightingale	6,860 0 0
W. Brass	6,947 0 0
W. Downs	6,933 0 0
E. Lawrence & Sons	6,895 0 0

For new Sunday-schools, class-rooms, and alterations, Wesleyan Chapel, Hampstead. Mr. Chas. Bell, architect. Quantities by Mr. Henry Lovegrove, 26, Budge-row, E.C.:—
Wall Bros. £3,124 0 0
Watson 3,078 0 0
McCormick & Sons 3,055 0 0
Taylor & Grist 3,051 0 0
Allen & Sons 2,853 0 0
Burford & Sons 2,848 0 0
Anley, Dalton & 2,790 0 0

* Accepted for a portion of the work, omitting caretaker's house, &c.

For rebuilding Nos. 1 and 2, New-street, Bishopsgate. Mr. Chas. Bell, architect. Quantities by Mr. Henry Lovegrove:—
Lodge £4,200 0 0
Gibbons 3,200 0 0
Rayner 3,075 0 0
Allen & Son 2,980 0 0
Anley 2,849 0 0
Shepherd 2,925 0 0
Woodward 2,920 0 0
Staines & Sons 2,914 0 0
Scrivener & Co. 2,884 0 0
Holliday & Greenwood 2,687 0 0
Smith & Sons 2,615 0 0
Green, Clapton (accepted) 2,637 0 0

For alterations and repairs to the Lord Derby public-house, New Cross, for Mr. Charles Bull. Mr. H. Roberts, architect:—

Mower	£288 10 0
Long	278 0 0
Holloway	269 0 0
Hubble & Trott	263 0 0
Taylor (accepted)	225 0 0
Nice	159 0 0
Scott	120 0 0

Feather's Work.

Long	£3 15 0
Banks (accepted)	55 0 0
Ruse	54 0 0

For building the Institute, Victory-place, Walworth. Mr. J. E. Sears, architect:—

Batley	£1,899 0 0
Marland	1,845 0 0
P. Higgs	1,845 0 0
Downs	1,833 0 0
Tarrant & Son (accepted)	1,796 0 0

For reinstating the British Oak public-house, Oxford-street, Whitechapel. Mr. R. Willey, 86, Ludgate-hill, architect:—

Healey	£550 0 0
Clarke & Bracey	447 0 0
Holmes	339 0 0

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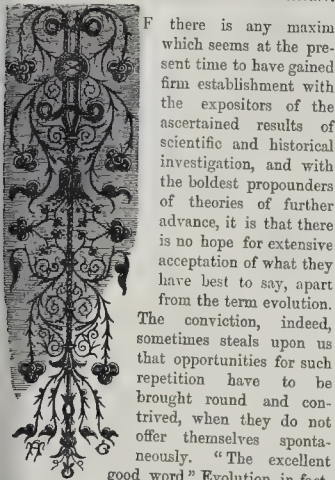
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Originality versus Evolution in Architecture.



F there is any maxim which seems at the present time to have gained firm establishment with the expositors of the ascertained results of scientific and historical investigation, and with the boldest propounders of theories of further advance, it is that there is no hope for extensive acceptance of what they have best to say, apart from the term evolution. The conviction, indeed, sometimes steals upon us that opportunities for such repetition have to be brought round and contrived, when they do not offer themselves spontaneously. "The excellent good word" Evolution, in fact, is in some danger of becoming a mere password or badge of party. It is not among the students of architecture that a reasonable theory of evolution will be undervalued or unrecognised, and they, if any, will be prepared to resent and regret that its useful technicalities of expression should degenerate into cant. The archives of architecture are unrivalled in richness and profusion among those of all the arts. These archives are its monuments which are preserved to us, in reality as well as in record, in succession almost unbroken from the very commencement of written history through century after century; and even when written history fails us, monuments which testify to their own relative, though undetermined, dates, provide no scanty materials for a history reaching back again far towards the very commencement of civilised society. Nothing can be clearer to the student of this marvellous series of the productions of human labour, perseverance, skill, knowledge, and imagination, than the intimate dependence of the works of each new epoch on those that have gone before. In comparison with the transitions by which the architecture of Henry VII.'s Chapel affiliates to the templar architecture of the Greeks, even "the pedigree of the horse," as propounded by the president of the Royal Society as a certified example of the evolution of species, is a collection of loose and of unmatched links indeed.

The student of art, however, has no need to assist on a comparison with the philosophers which, if pressed too hardly, might seem injudicious or unkind. "Development," his old

word, serves his purpose well enough, without trespassing upon the formula of evolution, which makes some pretensions that are likely to be encumbrances. In tracing the development of art we are, at least, not grudging the assumption of conscious intelligence as a factor in place of mere blind differentiation and integration. Not only is the suggestiveness of new circumstances an original and novel element, but still more distinctly original is that exercise of inventive power for which old English good sense had a name in the good old English word,—mother-wit. After we have allowed for everything else, and taken account of all natural external suggestions and traditions, this power still asserts its independence and over-ruling importance. Among all other factors it is the manipulating factor. Manipulation has to do what it can with available materials, and will often have to groan under the restraint of their intractable constitution; but what it succeeds in doing that is of most value will not, when true mother-wit is in question, be found to have been deducible as a natural consequence from the nature of the materials, the circumstances of the case, or the action of the average intelligence of commonplace humanity.

Origination is, in fact, very truly and very extensively antithetical to evolution, unless an illicit extension is given to the latter term, which would involve a contradiction. It is impossible to withhold from entering a protest when it is assumed by the rigid evolutionist that even the simple suggestiveness of circumstances must have lost all power of primary origination after a single exertion, and died out once for all, and that future ages were left to the resources of simple imitation. Yet this seems frequently to be taken for granted, and here is an example. The bronze swords, of which specimens are exhibited in the British Museum, are found with what has been called a bulging curvature towards the point,—the leaf-shaped swords of the archaeologists. This form we are instructed to regard in them as a mere imitation of the earlier hammered bronze spear-head, which, in turn, owed its form to imitation of the earlier chipped flint-points. But why need the form of the spear-head be explained by imitation? There would be reason for this if it exhibited peculiarities inappropriate for its purpose, though suitable for some earlier weapon. The pointed form, at least, must be accepted as under no obligation to an earlier hint that it would assist the purpose of penetration. The widened form of the blade as naturally expresses a design independent of any tradition to widen the inflected wound, and the leaf-shape is completed by the narrowing required in order to attach the head of the spear to the wooden lance. The

same suggestiveness of purpose would account for the independent origination of any number of localities of the leaf-shaped sword as a stabbing weapon, which it certainly was; and, even had it been pointless, this bulging curvature was precisely suited to assist effective cutting power, which was not required of the spear in any shape.

Now the case is precisely the same in architectural development. The dependence of an architectural type upon an antecedent example is only to be certified by agreement in details which are not the necessary, or may not be the natural, suggestions of purpose and occasion; in the case of a noble architectural type, such evolved or derivative details are trivial elements in comparison with the metamorphic power of true architectural genius. We do not assume that the door of a Greek house or temple was due to evolution of a primitive or foreign type. There was no need for a traveller to have visited the banks of the Nile before a wooden post was employed to support an architrave, before a rough post was squared, or before the awkward angles of a square post were chamfered. The philosophy of the case so far is fully supplied to us by Touchstone: "The heathen philosopher, when he had a desire to eat a grape, would open his lips when he put it into his mouth; meaning thereby that grapes were made to eat and lips to open." The same philosopher covered his head against the sun and his house against rain, and had only the sun and the rain to thank, and not a hint from his ancestors for either precaution.

It is with no desire to under-rate or detract from the splendid archaeological services of Dr. Schliemann, that we take from his last book, "Troja," an illustration of these fallacies; but because we are invited thereby to an analysis of the true function and appropriate characteristics of the *anta*, and its relation to the pilaster.

Among the discoveries which rewarded a final and systematic exploration of the Hill of Hissarlik, very interesting was the identification of the lower walls of two oblong buildings which in proportions, plan, and juxta-position have a remarkable agreement with temples of the Hellenes, and were very probably temples. These walls were of crude brick, burned *in situ* after erection; the ends of the side walls were advanced, as if to embrace a sort of portico or pronaos, and the precarious material was protected by being faced with solid jambs of upright timbers, six to the thickness of a wall of nearly 5 ft. The same system was applied to advanced walls of a gate of the city or acropolis. The interpretation of the function of these given by Dr. Schliemann's architects is doubtless correct: these ancient wooden

parastades had two important constructive purposes, "for they served both to consolidate and secure the front faces of the lateral walls, and to render them capable of supporting the ponderous weight of the superincumbent cross-beams and terraced roof" (p. 279).

We must demur, however, when invited to assume as "a new and striking fact in architectural history, that the upright joints now first found at Troy were the true constructive origin of the ante or *parastades*, which serve only an ornamental purpose in the Greek temple; that, in fact, the ante of later ages were nothing else than a reminiscence or survival of these ancient wooden *parastades*." The suggestion is quite as wild as that "the timber architrave is the long recognised original of the stone architrave of a Greek portico. In neither case is there any more need for leaning upon a theory of survival or reminiscence than as between the modern shoe and the ancient sandal, or than Touchstone had for looking out precedents in the practice of ancient philosophers when he had a mind to eat a grape.

If we are to understand the true meaning and function of an ante, we shall do better to dismiss all such speculations, and concentrate attention on the natural suggestiveness of the architectural member under special conditions of construction.

The problem of the appropriate treatment of a wall at its termination comes up in two chief forms, accordingly as the wall is returned at a right angle, or stands as an advanced end. In either case, whether of short termination or of transition, there is the same reason for some distinctive treatment, as there is for an expressive indication of the conclusion of a musical phrase. Some observations have already been made in the *Builder* as to the unhappy weakness of effect which is due to the customary system of closing courses of brickwork at an angle; and there is the same liability with masonry. The marble masonry of the Greek temples exposed only stretchers. This was the case on both sides, even when the wall exceeded the thickness of the blocks; transverse blocks being then countersunk, to secure interior bond, and any interval was filled with coarser stone. But the end-face of the wall had to be completed, and could be completed most appropriately, with blocks equal to its full breadth, which might not exceed the length of the ordinary blocks. These, however, it is clear, could only be finished laterally by half blocks in alternate courses, thus introducing a suggestion of weakened construction at the very point of chief liability to injury. The suggestion might be a mere suggestion; but it is a detrimental suggestion, nevertheless; the mere hint of awkwardness, however vague, offends a fine sensibility. The angles of houses in London squares are, no doubt, as strong, and visibly so, as when they were first built, even where the proportions of the bricks certify to a date anterior to the form enforced by taxation; but the suggestion of indifference, if not to real weakness, to our being reminded of it, is not the less a disturbance of true artistic repose that were well spared. True refinement is as much dependent on art as in manners on observances of delicate suggestiveness. They are the very soul of courtesies which have the same sanctions that so seriously regulate the graces of existence by attaching rational significance and even a moral motive to the removal of a hat or a glove. The Greek architect, building in marble, was careful to preclude the suggestion of weakness at a point where the Trojan had real weakness to contend with; and he so treated the end of his wall as to signify that it was deliberately concluded, not stopped abruptly. It would have helped in no degree to have shown his wall as abutting against a pier; the expression most required of tie and bond would then lose rather than gain. He effected his purpose by an advanced vertical member, but advanced by so slight an offset from the general face of the wall that it was effectually restrained from asserting its independence of the wall. It appeared naturally developed from it, not applied to it. It was open to the architect in consistent adherence to this principle to make, originally at least, the vertical line of the offset coincident

with the joints of the half or of the entire blocks, and thus to provide an accentuated stop for the prolonged courses of his masonry by an upright of either a broad or a narrow face.

The free end of a flank wall was, in many cases, regulated in breadth by a certain relation to the mass of the column of the portico in front of it; and, by the same rule, the breadth of the ante was governed on one side by the responsibility to the architrave of the pronaos column. At the eastern end of the Theseum, the architrave of the pronaos which supports a sculptured frieze is continued clear across the lateral peristyle; and the lateral face of the ante is, therefore, also broad. Such is uniformly the case with both fronts of the Ionic temples of Asia Minor, where the ends of the flank walls range exactly with columns on the flanks. It is otherwise at the west of the Theseum. The termination of the flank wall is here seen through the intercolumn, and it is, in consequence, found sufficient to allow the ante a narrow face, as in the Erechtheum, and most usually in other temples which are destitute of peristyles.

The ante was further retained in dependence on the wall, by the capital which it required in necessary response to that of the column from which it received beam or architrave, being harmonised with it by contrast rather than resemblance; then by the upper wall mouldings running on to form an important part of its capital, and by the moulding at the foot of the wall being continued to form its base.

Nothing, therefore, can be more false in principle than the current definition of an ante or ante pilaster as "a certain description of pilaster attached to a wall." It is the primary fault and opprobrium of the pilaster of the Romans and the Renaissance, that it declares itself as an artificial adjunct, as applied to a wall. Pope, whose taste was certainly here in advance of his friend, Lord Burlington, recognised the incongruity in his satire on unintelligent architectural composition,—

"Then stick four slices of pilaster on't,
Which, laced with bits of rustic, make a front."

"Stuck on" is what pilasters for the most part appear, but the objection is never chargeable on the Greek ante. The Greek architect of the Erechtheum set the world an example of varied treatment of the ante with effect and appropriateness. We find it with a narrow return upon the flanks accepting the same rich mouldings which crown the wall below the architrave. In the north portico the capitals, in like manner, unite with the stringcourse above the doorway, and the profile of the bases is continued as a moulding along the foot of the wall. The end of the projecting wall, which forms the back of the north portico, has a beautiful compound section with returned mouldings; and still another combination is exhibited at the south-western angle of the temple to unite the flank wall with that of the engaged portico.

It would be difficult, however, to discover traces of the reception of the instructive lesson in latter Classic architecture. The Romans substituted the pilaster for the ante, and, for the most part, neglected the engaged and responsible column, for the column standing free in front of the wall, however close to it,—or if engaged, only exhibiting a fictitious relation to epistylia that were constructively independent of it. Progressive degradation, instead of evolution by the survival of the fittest, leads us at last to Diocletian's palace at Spalatro. Here we are at the summit-line of divided architectural watershed, between ancient and Mediæval Europe. In the Golden Gateway we have pilasters "stuck" against the wall, and Corinthian columns on brackets in front of it, while in the courtyard corrupt tradition is frankly broken with, and archivolts spring directly from the capitals of a colonnade. Centuries, however, had still to pass on before the united common sense, mother-wit, and genius of the Mediæval architect designed piers which did not have the effect of solid cores with slices of pilasters attached to them, and clustered columns which declared themselves to be

clusters, not aggregations; and majestic architecture again assumed that semblance of true organism which enables us to pass to it from the contemplation of the noblest works of nature with a sense that we are still not remote from the agency of creative power.

WHERE TO TURN.

The fresh editions, called for from time to time, of Molesworth and Hurst, show that the new generation, which has grown up since the first was started, also provides itself liberally with those helps to memory. Messrs. Spon are also the publishers of a pocket-book,—that is, a little book $4\frac{1}{2}$ in. long by 3 in. by $\frac{3}{4}$ in.,—which they call "Spon's"; and the eleventh edition of this is now before us.* About half of it is a price-book on a small scale, and the other half consists of useful memoranda about things in general. The memoranda are placed alphabetically,—hoop iron is followed by inaccessible heights, and piers by pillars. Molesworth,—aiming mainly at civil and mechanical engineers,—has formulae and notes bearing on railways and roads, docks, canals, mill-work, water-power, and windmills. These find no place in Hurst, which is called an architectural surveyor's handbook. The measurement of builders' work, constants of labour, valuation of property, are treated at more length than they are in Spon's. Its speciality consists, as we have said, in builders' prices and memoranda of a general kind for people engaged in ordinary building. Earthwork, brickwork, masonry, arches, trusses, columns, beams, and other such common things, necessarily come into every book of the sort, and about the same statements must be made with respect to them. Mr. Hurst's "Engineers' Tables," $2\frac{1}{2}$ in. by $1\frac{1}{2}$ in., for instance, covers a good deal of the same ground, and its 140 tiny pages of small print are consequently found suited to waistcoat pockets which are decently capacious. In Spon's there are signs of diligent revision which leave a pleasant impression; the editor is a practising architect, well known to all the world as the winner of the Glasgow Municipal Buildings competition. We have no fault-finding to do, but as suggestions are requested we will make one or two.

The rainfall per annum is given (p. 130) for Glasgow and some other important centres, but London is left out; in such tables it should be stated whether the depth given fell in the year before the publication, or is an average of some number of years. The latter would be the more useful. In 1882 the rainfall at Guildhall was 27.10 in., falling on 132 days; at Camden-square 27.10 in. fell on 165 days; in 1883, at Guildhall 19.84 in., and at Camden-square 24.40 in. The statement (p. 20), "Bricks absorb about one-fifth of their weight in water," may be true in several senses. A fair stock brick, weighing a little over 5 lb. when dry, will absorb about half a pint of water if it is immersed for some hours. If such a brick contains 96 cubic inches, 1-7th of its bulk has been absorbed, or 1-10th of its weight. Bricks without a fair power of absorption do not make good work. A very porous Bedfordshire brick, tested some years ago, absorbed 1-8th of the weight of the dry brick,—1-5th of the bulk. The bricks were made for the owner of the proposed buildings in his own brickfield. Those previously made with rather less care had a good reputation for lasting, although a poor one for keeping out wet. Built with $2\frac{1}{2}$ in. cavities,—a dry house, and one likely to last long, was erected. The test by absorption is a rough one, as the sizes of the internal cavities will vary; and out of a number of trials no rule has yet been constructed by which bricks for solid walls should be accepted or rejected.

The ordinary table giving the number of pieces of paperhangings required for a room, by means of the measurement round the walls, and the height from skirting to cornice, might

* "Spon's Architects' and Builders' Pocket Book of useful Memoranda and Prices." By W. Young, architect, author of "Picturesque Architectural Studies," "Town and Country Mansions," &c. Eleventh edition. E. & F. N. Spon, London and New York.

find a place. It is useful in checking, though too liberal, if doors and windows have been scattered about with much freedom. Instead of the weight of lead pipes (p. 228) being stated as "light, middling, and strong"—a list of weights kept in stock by some good manufacturer would be more useful. There must be "light, middling, and strong" among all pipes,—that goes without saying; but it is in practice a capricious classification; $\frac{3}{4}$ in. and 1 in. lead pipes are commonly kept in stock in eight different strengths. In Spon's we have:—

	Light.	Middling.	Strong.
1-in. pipe, p. 126	2 4	2 5	3 33
And again at p. 228	2 0	2 6	2 8

No better illustration could be given of the difficulty. Drawn lead-pipes are sold by manufacturers in coils of 60 ft. up to $1\frac{1}{2}$ in.; 30 ft. thence to $2\frac{1}{2}$ in.; and larger than $2\frac{1}{2}$ in. in 10 ft. lengths. Pipes which must be bent a good deal, especially in short bends, are none the better for being heavy. The size of a pipe is generally understood as the clear bore, unless otherwise described; cast-iron down-pipes, however, are frequently made so that the bore and one thickness of metal will give their recognised diameter; brass threads for gas are always measured externally.

The regulations of water companies vary. The New River Company stipulates that each communication pipe,—that is, the pipe for communication between the company's pipe and the premises to be served,—shall be of the following strength:— $\frac{3}{4}$ in. internal diameter, 5 lb. per lineal yard; $\frac{1}{2}$ in., 6 lb.; $\frac{1}{4}$ in., $7\frac{1}{2}$ lb.; $\frac{3}{8}$ in. 9 lb.; 1 in., 12 lb.; $1\frac{1}{4}$ in., 16 lb. But the minimum weights of warning pipes and other lead pipes having open ends may be as low as $\frac{3}{8}$ in. 3 lb. per lineal yard; $\frac{1}{2}$ in., 5 lb.; 1 in., 7 lb.; $1\frac{1}{4}$ in. 9 lb. Coils of pipe are charged for, not by the nominal weights, but after actual weighing immediately before being sent out. We cannot in the present state of things agree with the note on page 234,—a "zinc gauge should be specified." It is far better to specify the weight per foot. No. 14 gauge is given as 21 $\frac{1}{2}$ oz. per foot, as against 18 $\frac{1}{2}$ oz. in the present lists of the Vieille Montagne Co., and No. 15 as 24 oz. against 21 $\frac{1}{2}$ oz. The "new tariff" is about one gauge lighter than the one before it; and judging by the past, there may possibly be further changes in store for us. In olden days No. 14 was 24 oz., and No. 15, 26 oz. to the foot.

The memoranda as to Cuban brickwork (p. 417), and the unpriced schedule as to Manningham stone (p. 284) seem astray. There is a vagueness about bushels, and common weights and measures generally, in too many pocket-books: the thing to keep in prominence about the bushel is that it is 221 $\frac{1}{2}$ 192 cubic inches, or about $1\frac{1}{4}$ cubic foot. Thus, for instance, the statement on page 123, "21 bushels of sand=1 yard," might lead to misconception if the reader were ignorant, permanently or temporarily, of the nature of a bushel. The statement is equally true of the gray and blue limes, cements, &c., which are hovering round. We are not fond of the rule as to light on page 94,—the superficial area of window should equal the square root of the cubical space in the room. Take a room 14 ft. by 14 ft. by 10 ft.=1,960 cubic feet. The square root of this is 44,—or window glass 7 ft. high by 6 ft. 3 in. wide, which is absurd. Mr. Young notes that "this rule is not universal in its application"; neither is any other which the world has seen yet. The best way yet found out of finally determining on lighting area is for a practised architect to feel satisfied with it as designed. The rule which hangs about in oral tradition,—divide the cubical space in the room by 80, and this may be the glass area,—is attributed to a shrewd and successful house-builder of the last generation; and his rule gives a better result in the case which we have suggested,—that is, it works out at 24 $\frac{1}{2}$ superficial feet of glass, or 7 ft. by 3 ft. 6 in., which would be about right under ordinary circumstances. A number of other points had been noted for remark, but they will make no more suggestions in this vein,—lest the enemy take occasion to blaspheme; besides, the editor of any pocket memorandum-book

may fairly cry out that the line must be drawn somewhere, or what should be a booklet will require a very special pocket.

The same class of remark might be made by the Editor of "Laxton's Price Book,"* and contrasts drawn between the edition of 1884 and those of previous years. The 1851 edition happens to be the earliest at hand at the moment; it contained about 250 pages. In this year's edition there are 510 pages of text and 115 of indexes, trade advertisements, &c.; that is to say, there was a youthful slowness in 1851, when 8,000 prices were dealt with; in 1863 there were 30,000, contrasting with the portly volume for the present year, which contains 72,000.

The vanished years come back vividly in recollections as the pages of the old edition,— "by W. Laxton, Architect and Civil Engineer,"—are turned over. Of the present district surveyors, less than twenty then held office, out of between sixty and seventy. The power of appointment was with the magistrates under the Act of 1844; the existing Act was passed in 1855, and the Metropolitan Board of Works has thus made the appointments for nearly thirty years. In the old Act "the said Lord Mayor and Alderman and the Justices are required, but subject, nevertheless, to the consent of one of her Majesty's principal Secretaries of State, to nominate and appoint as surveyors such discreet persons of the full age of thirty years, and properly educated and skilled in the art and practice of building, as they shall think fit." The 1874 Act, which, early in the forties, was written of as "in so many respects a mass of absurdity that it ought long since to have been repealed," is responsible (sec. 62) for the genial phrases in which suitable officials were described in 1844. They are simply "qualified persons" in the present Act. The father of the district surveyors, as he is affectionately called,—Mr. Edmund Woodthorpe,—was appointed to Limehouse, &c., in 1839, and to the Northern Division of the City of London in 1853, both before the revolution.

In Laxton the treatment of the Metropolitan Building Act, with an appendix of unrepealed sections of the old Act, decisions on the Act in the Superior Courts, full index, list of districts, the 1878 Act, the Board's By-laws,—has always been very liberal; and the general information is that of a good handbook. Stating prices is, however, the main purpose; and it is done with diligence. There is a good modern tone; drains and sewers and sanitary work are treated under separate headings; grease-traps, flushing-tanks, telephones, electric lighting, and the like appear in their proper places.

Comparing the prices put in price-books at different dates upon the finished work of the builder,—the future antiquary will conclude that there was a serious rise all round during the last quarter of a century. He will observe the wages rate charged by masters for artisans increased from 5s. 6d., 5s. 9d., and 6s. per day, to 7s. 11d., 8s. 4d., and 8s. 9d., and that labourers were charged for at 5s. 5d. or 5s. 10d., against 3s. 9d. or 4s.; that is a rise of about half as much again as the original rate. He will observe that a good number of labour prices are swelled in something like that proportion, but that the prices put upon the finished articles are swollen further by additions on the master's prices of materials; noting Thames ballast at 7s. 6d. a yard against 4s. 6d.; stock bricks, 36s. against 30s.; lime, 16s. a yard, against 11s. 6d.; Thames sand, 8s. a yard, against 5s. 9d.; fir timber about 19l. per Petersburg standard, or 2s. 3d. per cubic foot, as against 15l. 10s. per standard, or 1s. 10d. per cubic foot; York stone in blocks, 3s. to 3s. 3d., against 2s. 2d., &c. Building costs a good deal more money than it used to do, and the inventor who would make it cost less, otherwise than by the old-fashioned expedient of crowding more hours of work for the same payment into a man's day,—would deserve pity of us all.

As a good illustration of the difficulties with which those who dip into a price-book occa-

* "Laxton's Builders' Price Book for 1884." Sixty-seventh edition. Kelly & Co.

sionally have to contend, as also of Mr. Young's remark (p. 235), that "as the prices of materials are constantly varying, it will be prudent to get special quotations for large contracts," we will group together some statements as to leadwork from Spon's Pocket-book, Laxton's Price Book, and Lockwood's,* an intelligent and serviceable guide, revised and edited by Mr. Francis T. W. Miller, A.R.I.B.A., &c. :—

	Spon's.	Laxton's.	Lockwood's.
Milled lead, in sheets, per cwt.	27	18	20
" cut to sizes...	29	20	23
" laid in gutters	32	25	25
" or flats	33	27	26
" in flashings...	33	27	26

Taking 14s. per cwt.,—somewhat over the current price at the present time paid to manufacturers for milled lead in sheets delivered in London, adding 6s. per cwt. for labour and solder, we arrive at 20s.; and 20 per cent. profit will bring it up to 24s. per cwt. for lead laid in gutters and flats. The differences in the prices,—looking considerable at the first glance,—are in reality very small,—the greater part is due to the first cost of material. It would depend upon the size and situation of the work whether any one of the varying amounts for labour was, or was not, a reasonable one.

Unverified constants of labour are dangerous weapons in hands which have not proved themselves in their use well beforehand. For instance, in a recently-published book, the constant for deal sash-frames and 2-inch sashes double hung works out at 148,—say one-seventh of the day of a joiner for labour and nails,—that is, for the workman's time, glue, requisite services of a labourer, and master's profit. No compiler can undertake to originate or test minutely *everything* which he inserts in his compilation; even his laborious life might prove too short for that. Counsels of perfection apart, he will generally feel that he has done his duty pretty fairly when he has made a correct extract, from an authority who has generally been looked upon as trustworthy. The constant mentioned has, however, been the subject of a revision. In both the Ryde and the Dobson of about thirty years ago the same service works out at 166, say one-sixth of the day of a joiner. Reckoning the master's price at the present time at 10 $\frac{1}{2}$ d. per hour, or 8s. 9d. per day of ten hours, one-seventh of a day will give 1s. 3d. for the work priced by Laxton at 10d., and Lockwood at 8 $\frac{1}{2}$ d. The moral usually pointed is that price-books, lists of constants of labour, memoranda, and, generally, all compilations which state results, and by the nature of the case cannot lay bare the processes by which the results have been arrived at, and all the circumstances which make one thing true one day and another on another, need special practice if they are not to mislead. Some people, who are very anxious to make everything clear, would hasten to add that the same thing may be said of almost any mystery, and they draw two deductions from their premises. One is that their friends who have little or no acquaintance with any technical matter will, if truly wise, leave it wholly from first to last in the hands of an expert. The other deduction is that a slight acquaintance with doubts, difficulties, and confusion should, after a properly-bought experience, lead to the same result.

The advertisements interleaved in the index, which erewhile worried us, are very properly absent, there being little more "prominence" in either Price Book than in the *Times* or the *Builder*. A contractor for bill-posting feels himself justified at the present time in paying a larger rental for the use of a huge hoarding in a prominent London thoroughfare, than the building site which the hoarding hides is at all likely to produce when let on a building lease. So stern and ruthless is the general onward progress that the dread of finding the virtues of mustard, dog-biscuits, or water-waste preventers inserted at the critical pages of third volumes seems fairly to hang in the air. Any sign of halting is, therefore, very welcome.

* "Lockwood's Builders' and Contractors' Price Book for 1884." Crosby Lockwood & Co.

THE LATE DUKE OF ALBANY.

THE lamented and unexpected death of H.R.H. the Duke of Albany has already been the occasion for so full an expression of public regret and sympathy through the columns of the daily press, that any addition to that expression which we can make at this date must come with greatly diminished emphasis, and can only seem a repetition of what has been in every one's mouth already. We may, however, observe that there are one or two facts among the records of his life which connect him with some of the work and some of the interests which it is our duty to endeavour to forward. In addition to the various branches of study in which, as we know, the Duke of Albany interested himself, he was also active in endeavouring to promote the improvement and beautifying of the poorer districts of London, and took a prominent part in the work of the Kyrie Society, the objects and achievements of which we commented on in a Note last week, interesting himself personally in schemes for the laying out of gardens and decoration of hospitals and other buildings.

The Duke of Albany was also an Honorary Fellow of the Royal Institute of British Architects, and President of the Parkes Museum of Hygiene. In the latter capacity he presided, less than a year ago, over the proceedings connected with the opening of the new Museum in Margaret-street, and made a thoughtful speech (which will be found reported in our number for June 2, 1883) on the aims and objects of the founders of the Museum. "Our endeavour," he said, "will be to make the Parkes Museum in every way worthy of the man whose name it bears. To do this we look for the ungrudging and cordial support of all who are interested in sanitary progress." We are sorry to say that recent accounts to hand show that this appeal has not met with anything like so adequate a response as could be wished.

These brief notes we may the more suitably make, as the facts to which they relate have not, as far as we have observed, been commented upon among the various notices that have appeared of a life which seems to have shown unusual tendency towards the pursuit, so far as health and circumstances allowed, of good and worthy objects.

NOTES.

WE give, in another place, the names of the authors of the nine designs which have been selected by the committee appointed to examine the drawings sent in for the first competition for the new Admiralty and War Offices. The committee cannot be accused of being dilatory in the discharge of their functions; on the contrary, we can only express a hope that the conclusion come to in so short a period, over the merits of such a number of designs as were known to have been sent in, has not been based on too hasty an examination. The result seems to confirm the views which have sometimes been advanced in favour of the competition system, as a means of bringing into prominence unknown merit; and even in regard to those in the list whose abilities are well known, it will certainly be considered matter for surprise that not a single one among those who rank as the leading architects of the day is included in the list. This very unexpected result certainly tends to emphasise the feeling which many persons already entertain, that in common justice to the unsuccessful competitors, the first competition designs should be exhibited publicly, both that those who have toiled for nothing may at least have the advantage of public exhibition, and that we may have some chance of understanding how all our leading architects come to be out of the running; unless indeed

they have all had wisdom granted them from above to shun the snare. There is another point the authorities certainly ought to reconsider; the time allowed for the complete drawings. A committee may find it easy to go with a light heart through several hundred drawings, but the two architects on the committee ought to know very well, if their colleagues do not, that a complete set of plans for such a building cannot be devised, thought out, and executed by the 24th of June (the date fixed) without either painful overwork or hasty and incomplete thought and execution. The time ought to be extended, if justice is to be done to the building and to the architects.

At a meeting of the General Committee for the selection of a cathedral site, held in the Council Chamber of the Liverpool Town Hall on Tuesday last, the Bishop of Liverpool presiding, the adoption of what is called the St. John's Church site, at the back of St. George's Hall, was carried by 41 votes against 30. Reading carefully through the detailed report of the arguments *pro* and *con*, as given in the Liverpool *Daily Post*, we are disposed to think that this was the best practicable decision that could have been come to. On purely architectural grounds, indeed, the site by the river, on the space at present occupied by the George's dock basin, would have been magnificent, and would have given such an opportunity for effect as has but seldom been afforded in the history of architecture; but it is stated that the land, if the dock basin is filled up, is likely to be wanted for other purposes. The other sites proposed are all deficient in significance and centrality, practical and aesthetic. The site adopted is somewhat confined, but it is in the midst of what is now the architectural centre of the city; it stands on rising ground with considerable opportunity for effective emplacement; and it is more central for access than most of the other sites that have been suggested. Its possible effect on St. George's Hall is, however, a more important point than some speakers at the meeting realised. The back elevation of the hall was denounced as "a sham," the obscuration of which was of no consequence. The whole design of the hall is a sham, if we come to that, but the back elevation is a most interesting and, as far as we remember, unique attempt to translate a certain form of Egyptian architecture into Greek language; to an architect it is about the most interesting part of Elmes's design, considered simply *quid* design. The suggested arrangement of the cathedral site, published in the *Daily Post*, is by no means to be recommended; it does not suit the shape of the site, and fritters away some of its capabilities by getting the cathedral up on to terraces and bridges. Let them try, as the idea of St. Paul's is evidently rather predominant, a version of Wren's earlier Greek cross plan, filling the space much more evenly, and with a grand unbroken flight of steps rising from the lower levels to the façade of the building. Nothing that can be done, in the space, could surpass that for effectiveness. There seem to be whispers of the adoption of a Classic style for the cathedral. If this were really a powerful and original treatment of Classic motifs, not a parroting of Wren details (many of which are as bad as can be), the experiment would be well worth making, and might result in a building more expressive of the spirit of modern Christianity than any Mediaevalised structure could be.

WE print elsewhere a characteristic correspondence between the Society for the Protection of Ancient Buildings and Mr. H. H. Gibbs, who is supplying the funds for the restoration of the altar-screen at St. Alban's Cathedral. As usual, the Society contrive to appear as a body whose motives are right and their reasoning and logic as wrong-headed and ridiculous as anything can be. As usual, they commence with a moderate statement of their views and a studied courtesy, and when that does not bring them the assurances they require, they relapse into impertinence and extravagant assertions and misrepresentations. This kind of procedure appears to be part of

the policy of the Society, and would, in our opinion, justify any person who receives a first letter from them in declining any reply in future. The assertion that there is no interest in any modern sculpture, and that the Mediaeval school of sculpture was one capable, "by its meanest members," of executing "infinitely better work" than any that has been seen in modern times, is a happy example of the tone of supercilious ineptitude which characterises the effusions of the Society. We may add that we have reason to believe that the restoration of the altar-screen is in good artistic hands, and will at all events turn out a very different stamp of work from that which irresponsible Vandalism has affixed to the front of the cathedral.

THE Ninth Report of the Historical Manuscripts Commission has been issued, and contains a great deal of matter that is likely to interest the antiquary and the architect. Mr. H. Maxwell Lyte, to whose competent hands the task of examining the muniments of the Chapter of St. Paul's was entrusted, has met with several curious examples of early conveyances, valuable not only on account of their phraseology, but also for the light they throw upon the topography of the City of London as far back as the twelfth century. The greater part of the collection had never been previously examined for literary or historical purposes, and a number of ancient documents were quite recently discovered by Dr. Stubbs and his sons in a long-neglected chest found in a loft over the Chapter-house. Of course, the fabric rolls of the old and new cathedral are among the most important of the records. Some of these date back to the reign of Richard II., and from 1633 to 1749 there are comprised in fifty-five volumes, finely written on vellum, the accounts for the repair and alteration of old St. Paul's, and also for the erection of the present building. There is also a valuable series of account-books relating to the rebuilding of the parish churches of London, destroyed by the Great Fire, and to the building of "tabernacles" in which divine service was celebrated during the reconstruction of the permanent fabrics. The call-books for workmen, and the details of wages paid throughout the seventeenth and eighteenth centuries, have been preserved, and are worthy of attention. We hope to have an opportunity of noticing some of the more ancient building contracts, in which will be found many obsolete architectural terms and references to the system of building that prevailed during the Middle Ages.

WE may draw attention to the fact that the Society of Arts are offering prizes for essays on the dwellings of the poor, for which object the sum of 1,200l. has been generously placed at their disposal by Mr. W. Westgarth, a member of the Society. The highest prize of 500l. is offered for the best practical essay of the whole subject of the sanitation and reconstruction of Central London; other prizes are for the best practical essay on the rehousing of the poorest classes, and for essays on the separate subjects of engineering, architectural, and sanitary considerations. Detailed particulars may be obtained from the Secretary, to whom essays are to be sent in not later than December 31 of this year. The offer is in accordance with the enterprise and public spirit which has always distinguished the Society of Arts, and we hope it may lead to some practical result.

WE have received a communication from Mr. Lawrence Booth, architect, of Manchester, written at the request of the Committee of the Salford Union Infirmary, giving the results of an investigation made by himself and the Superintendent of the Local Fire Brigade, Mr. Willis, as to the causes of the serious fire at Hope Hospital which occurred on Saturday. The ruins of the burned structure were in a state particularly favourable for examination; the roof of the pavilion having been completely destroyed, the walls and chimney-stacks were left absolutely bare. The examination showed that great care had

been, at all events, intended in keeping all timber clear of flames. The "structural defect" which caused the fire was the result of the eccentricities of one individual brick-setter, who had left a small aperture in the walls surrounding and forming the flue from the fireplace in the first-floor ward. The ingenious bricklayer had contrived his little defect in the only six inches of height in the wall in which it would not have been visible, the walls being unplastered; and the total cost of making a perfect job at that point, instead of the "little rift" which led to a serious catastrophe, would have been something under a penny. "It is impossible," writes Mr. Booth, "to identify the culprit among the numerous artisans who were engaged on the works; but if this communication should come under his observation, or that of his fellow-workmen, it is hoped that the fact of the fearful jeopardy in which the lives of many of their less-fortunate fellow creatures have been placed by one act of carelessness, may have the effect of making them realise a keener sense of the responsibility they assume for the faithful discharge of their duties, not only to their employers, but to the community." We hope so, indeed.

In a recent number of the *Semaine des Constructeurs* (March 22nd) are some remarks under the head "*L'Architecture des Bêtes*," which deserve to be noted. Speaking especially of cow-houses, the writer observes that almost everywhere in France, and in many parts even of England, animals are housed in a manner at variance with common sense, chained up close to a wall where no fresh air is admitted for breathing. The same might be said of many stables, though of course there has been some enlightenment on this point of late years. Still, it is common enough for horses to be stabled with practically hardly any provision for ventilation, or for bringing them uncontaminated air to breathe. Yet the physiological susceptibilities of quadrupeds are essentially the same as those of men, though perhaps less delicate, and require the same sanitary principles to be applied to them.

This amount of attention paid to architectural and archaeological subjects in our magazines at present is an indication of the increased public interest in such topics. The *English Illustrated Magazine* has especially favoured such subjects, and the number for the present month contains an interesting and well-illustrated article on "Charing Cross," by Mr. Austin Dobson, who is otherwise known as the writer of the best *vers de société* of the day, but who seems, like every man of genuine culture, to have varied interests. As a parallel to this, may be mentioned the article in the current number of the *Magazine of Art*, on "Sion House" (for "Syon," as the writer chooses to spell it), by Mr. Eustace Jalfour, who remarks on the familiarity of the exterior of the building to Londoners taking a holiday up the Thames (a familiarity which those who undertake pulling against the ebb up "Sion Reach" are apt to find unpleasantly persistent), and thinks they may as well know more of the interior. He describes the house with the somewhat indulgent criticism of a votary of Adam-ism; and some illustrations are given, adequate in their way, but of which one at least, "The Vestibule," shows too much of the now prevalent desire to obtain effect by lights slashed all over the block with little attention to definition of form; a style which, though unquestionably showy, is not sound. In the *Antiquary* (a model periodical, in matter and make-up, for its class of subject), Mr. E. B. Wheatley comments on old Cheshire, with the reproduction of some old engravings. We may commend to Mr. Wheatley's notice the remarkable restoration of Cheshire by Mr. Brewer, published in our issue for Feb. 2 of this year.

This statement which has been so confidently made in the House of Lords, that the Duke of Wellington never sat for the now celebrated statue, has been as confidently contradicted by the Duke of Rutland in a letter to

the *Times* a few days ago, in which he quoted documentary evidence in support of his assertion, which seems to settle the matter. It was partly on the ground that the living man had sat for the statue that we always urged that it ought not to be destroyed, and we therefore note that our grounds for this opinion have been confirmed on what appears to be absolute evidence.

THE DECORATIVE USES OF METALS.

It has become more and more a habit among the wealthy classes, in London especially, to place the decoration of their living-rooms in the hands of artists, and it is no uncommon thing to find the very ablest architects, and even Royal Academicians, designing or selecting down to the smallest articles of furniture, and arranging every tone and contrast of colour in the rooms handed over to them. We are accustomed to rooms panelled with carved oak, hung with embossed leather or tapestry, carpeted with Eastern rugs, adorned with the quaintest glass from Venice, and lacquer and ceramics from China and Japan; but, while all else harmonises to form a complete picture, the works in metal, the fenders and dogs that should glow with grace, the lamps whose shaded flame should first light their own intrinsic beauty, the window and shutter fastenings, the door-plates and hinges, whose every outline once exercised such minds perhaps as Cellini, Dürer, Memling, are now too often the creations of a hard mechanical Birmingham puncher. The lamps that depend from the very centre of a room or fill the arch of a corridor, or occupy the newel of a stair, are, especially if of the nature of "gas-fittings," some tawdry castings soldered together and blackened, or coated with red, brown, or green pigment to imitate bronze. In the midst of an almost all-pervading artistic revival it seems that only metal-work had lagged behind. Artists could not find in metal what was so ready to their hands in wood or woven fabrics. The reason for this is that Academicians cannot directly employ the variety of skilled craftsmen required to fashion metals, and it required an exceptional effort to get anything produced, and at a cost out of all proportion high. A master must intervene, and artist-masters, in this branch of manufacture, are rare in England indeed, and have yet to be trained.

It thus happens that though much skill and money are expended in forming the pictures in which we daily live our lives, they are too often blotted with the machine-made products of ignorance. It was not so where art existed in olden times, for what can be more truly artistic than the mosque lamps, or many of the cathedral lamps preserved from the days of Charlemagne to the Renaissance,—the candelabra and torch-holders, cressets, the exquisite Eastern work on doors, or our own Medieval hinge-work, "when the very nail-heads were things of beauty," the knockers and grilles, or even the homely fire-dogs? What we in England have so long endured with, in the way of metal-work, could only be tolerated where art had long slumbered, and now that it is reawaking it is time that the whole lot of Birmingham rubbish should follow the staring prints and chintzes and wall-papers to the "African market," or any other limbo willing to absorb it.

The Decorative Uses of Iron in the Past.—Chief among the metals used for domestic or economic purposes is Iron. From the extensive use that must be made of this metal, both inside and outside our buildings, its treatment or forging is of paramount importance, yet no branch of artistic manufacture has so completely lagged behind in our art revival. That this industry was at home in our country from the very early ages, is shown from the fact that peat-bogs and other exceptionally favourable stations have yielded weapons and fragments of unknown date, but which bear evidence of antiquity, interlacing them with the "bronze" age. These earliest specimens of European work possess no more than an antiquarian interest, and nothing is left that has been fashioned into a purely artistic form in this metal older than the twelfth century. Pre-eminent and unique in all Europe among such objects is the beautiful wrought grille that screens and protects the shrine of Eleanor of Castile in Westminster Abbey. This, the most venerable iron grille of European art, is of exquisite scroll-work, with leaves and rosettes

and little heads of animals, scarcely two of which are alike, and shows to what perfection the smith's art had even then attained. Thence its most fortunate preservation to having been for many years thrown aside as lumber and forgotten. We have, however, nothing like a complete record in this country of the progress of the smith's art. The next grille in point of date that has been preserved is of fourteenth-century work, and is extremely light and simple. The interval is a blank, except for the hinges of doors and muniment-chests. The grilles in our cathedrals of later date were obviously designed more for strength than beauty, though a few exist of lighter work, such as at Chichester and Arundel; but in other European countries the smith's work maintained its excellence both in point of design and workmanship. Still later, towards the close of the fifteenth and in the sixteenth centuries, perhaps as a result of the decadence, wrought iron gave way to wood and brass in the more sumptuous works required by the church, and it was not until Gothic architecture had passed away, and the use of iron had become general in domestic buildings, that the smith's art revived. Owing probably to the dampness of our climate, little out-door iron-work remains in this country of earlier date than the eighteenth century, though beautiful specimens abound in Italy, Germany, and Spain. With the reign of Charles I. a purer Classic style of architecture came in, and a change came over the spirit of design in England, and the ironwork, which was very largely used, became imbued with a character that remained essentially English, and continued, almost without modification, until a further change in fashion caused the smith's art to be for a time altogether forgotten.

The Extinction of the Art of Decorative Forging in Western Europe.—Mid-European art has been, since the days of the Grand Monarque, under the influence of France, and French influence doubtless led to the total cessation of the use of forged iron in architecture in the reign of George IV. The Great Napoleon, on assuming the title of Emperor, endeavoured to invest his newly-created dignity with greater reality and splendour by surrounding himself, as far as possible, with the attributes of the Cæsars, and the gorgeous, if somewhat debased style of Classic art known as the "Style de l'Empire," under his influence, displaced all others. This style was, unfortunately, quite incompatible with the lightness and elegance of wrought-iron work, and seemed to demand a somewhat elaborate and massive treatment of bronze for its gates, railings, and lamps. The intrinsic value of bronze prohibiting its use in such large masses in a general way, designs inspired by the bronzes of ancient Greece and Rome were, as a natural result, reproduced in the cheaper and baser metal, cast iron. In England the style acquired a simplicity of treatment and dignity under Nash in the days of the Regency that is not out of place in our London streets, and of which Regent-street is a good example; but still it afforded no scope for the smith, and the metalwork required by it was massive in character, and impossible to be wrought, and could only, in fact, be supplied economically by castings. Very little actual bronze was used, while of cast iron almost all that has been exposed has suffered mutilation, owing to the brittleness of the material.

The origin of cast iron is involved in some obscurity, and iron slag is often found in quantity where there is not even a tradition of the existence of smelting works. Most of the early foundries seem to have been on a very small scale, and located deep in forests where an unlimited supply of fuel could be gathered. The old fire-backs are the best known of the old castings, and seem, from the costumes depicted, to date at least as far back as Charles I. The railings of St. Paul's are well known as a very early example of the use of cast iron on a grand scale; but cast iron did not commence to regularly compete with wrought iron until the "Adams" period, when the two were often combined in the same design. Thenceforward it rapidly ousted wrought iron, and by the beginning of the nineteenth century had completely superseded it for all decorative purposes.

The Decorative Uses of Brass in the Past.—The artistic working of brass far exceeds in antiquity that of iron. Without going farther back than the introduction of Christianity in our own country, we find that already in the

tenth, and even preceding centuries, brass was extensively used for crucifixes, chalice, caskets, candlesticks, reliquaries, and other articles connected with religious ritual. A little later, more massive articles, such as the eagle stands and candelabra, were made from it, and still later the flat incised monumental brasses. Hanging coronas or circles of brass hung by chains, with sconces for candles, were very early introduced, the oldest of these extant being the gigantic coronas of Aix-la-Chapelle and Hildesheim, which, besides being richly perforated, have temple-shaped lanterns instead of the usual sconces to receive the candles. The image of a saint often occurs amidst the candles in German examples, and is mostly surmounted by a canopy. In late specimens the band is omitted, and arms to hold the candles spring direct from the base of the canopy. These, in most cases votive hoops of brass with sconces, often with inscriptions, and with or without canopies, remained almost the only form of hanging lamp used in our churches until Mediaeval architecture passed away. The forms of other ecclesiastical objects were also conventional, and subjected to no greater modifications. During the thirteenth and fourteenth centuries, at least, brass was embellished with the *champlevé* enamel and gilding. In the fifteenth century rich and massive screens and altar-rails, such as the superb screen and gates of Henry VII.'s Chapel, were introduced. There is little brasswork of the reign of Elizabeth, carved wood and alabaster to a great extent taking its place, and when it re-appears in our country it is in the plainest and severest forms, such as those depicted in numberless Dutch paintings and by Hogarth. The basis of nearly all these designs seems to have been a number of round balls connected by mouldings and necks, whether intended to form fire-dogs or candelabra. Large brass platters, with *repoussé* figures or ornament, were also made, but there was otherwise a nearly complete absence of ornamentation on works in this metal until the more lavish taste of Louis XIV. penetrated to England and led to the manufacture of the richly ornamental style of work known as "ormolu." The very distinctive styles of Louis XIV., Louis XV., and Louis XVI. were all in turn imported, and the brazen candelabra, clocks, and chandeliers of all these periods are very beautiful, and now command excessive prices, while the buhl and marqueterie furniture were largely mounted in brass. Our school of Chippendale, however, very frequently carved and gilded wood to imitate metal, and the brothers Adam still more often imitated it in wood and plaster. The French Empire gave a new impetus to brasswork, and entire tables and couches of exquisite finish and detail were made in it, though the style affected was mannered and peculiarly Gallo-Classic. English taste was, however, as much influenced as previously, and under George IV. the hanging oil-lamps with Argand burners, which were almost universally used, took a very elaborate and costly character, so that one of them was not thought an unworthy present even from his Majesty to so august a body as the Royal Academy of Arts. Little change in their treatment took place until the introduction of gas extinguished everything in the shape of artistic metal-work.*

PARIS STONECUTTERS, SAWYERS, AND FURNITURE MAKERS.

THE French Parliamentary Commission on the industrial crisis still continues its labours. The great army of workers pass in front of the Forty-four Commissioners as soldiers during an endless review, and it is impossible to think of the huge volumes that are being built from their evidence without feelings akin to alarm. Already a protest has been raised. The wisdom of the whole proceeding is open to question, and many persons are inquiring anxiously whether it is altogether wise to lay bare before the whole world all the shortcomings of French industry. If the case could be fairly stated, perhaps no great harm would be done, but the natural tendency of each witness is to paint the picture in the blackest colours. Already a German firm has printed in four languages the evidence given before the Commissioners, affecting the special branch of trade in which it seeks to compete with the French. The conclusion drawn is, of course, most damaging.

* To be continued.

French trade is represented as completely annihilated and supplanted by the German competition. All these considerations have not as yet affected the Commissioners, and they continue collecting evidence as in the past; opening the doors wide to all parties, and listening indiscriminately to every side of the questions involved.

The stonecutters of Paris gave evidence that they numbered, in all, about 18,000 workmen, some five years ago. The trade was now, however, so slack that there remained only 12,000 stone cutters in Paris, and by far the greater part of these workers were unable to obtain regular employment. The actual conditions of work are very severe, though the pay is not low for France. The men earn 8d. to 8½d. per hour, but they are expected to work from twelve to fourteen hours per day. About 300 out of every 1,000 workmen return to their native villages in the provinces during the winter; though a few years ago the number of provincials in the trade exceeded that of the Parisians. While the trade has fallen off, the salaries have not increased, and the delegates giving evidence declared that the wages were as good ten years ago. They further stated that, on an average, the stonecutters worked 240 days in the year, and this produced an annual income of 96l. The state of the works in course of construction and the projects in hand did not indicate that there was any prospect of improvement in the trade. When asked what remedial measures seemed most practical, the delegates suggested that the employers should retain a certain per centage on their salary, so as to create a benefit fund sufficiently large to render efficacious service. The fund actually in existence was absolutely useless; it was not seriously supported, and the amounts collected were as a drop in the ocean. The salaries, they further stated, need not be increased, but the hours of work should be reduced to eight or at most nine hours. The nature of the work was so laborious that it could not be maintained at a high pitch for a longer period. On the other hand, eight hours' good work should suffice to bring in wages amounting to the sum now paid for twelve to fourteen hours; that is to say, 7s. 2d. to 8s. per day.

The sawyers also work twelve hours a day. Their corporation consists of some 900 members, 800 of whom only obtain employment for a few days each month, and in the winter the work is restricted to eight hours. The pay, fixed by the town tariff amounts to 8½d. the hour; but in these bad times many men are glad to accept work at 7d., or even 6d., the hour. This depression they trace back so far as 1879; and though their syndicate possesses a benefit fund, the amount subscribed was so small that no efficient aid is given.

The machine sawyers compose a different corporation, numbering about 1,000 men, and there is also a trade union. Its affairs were, however, so badly managed that, though it possessed 700 members last year, there now remain only 300 adherents. The greater part of the workmen are out of employment, and the masters have profited by this circumstance, to reduce the salaries to 7d. the hour. One of the witnesses, M. Kaiser, pointed out that in this trade accidents were exceptionally frequent; and though the employers did pay benefits when such misfortunes occurred, they deducted at least half the money given from the salary of the workmen. He, therefore, expressed in energetic terms the desire of the entire trade to see M. Martin Nadaud's Employers' Liability Bill adopted by the French Chambers.

Intimately connected with building are the trades in furniture, and these have also suffered from the simple fact that, as the number of houses built is reduced, there are not so many apartments to furnish. It is estimated that there are about 25,000 cabinet-makers, turners, wood-carvers, and chair-makers in Paris. In the large workshops the time is fixed to ten hours per day, but those who are paid by the piece often continue toiling for fourteen hours. There are about 2,000 employers, though the masters' union consists of only about 115 members, but these latter comprise the heads of the principal firms. The delegates from this masters' union stated that some 5,000 men were now altogether without work, while an equal number were only employed for half the day. They could affirm, however, that at least 10,000 men were working full time and earning 6s. 6d. per day. In discussing the causes of

the depression, the representatives of the masters' union thought that the construction of large factories in the provinces, foreign competition, and the increased cost of production, had largely contributed to bring about the present result. Universal exhibitions had helped to develop the success of foreign manufacturers. The witnesses further complained of the spread of good taste in France. This, strange to say, they qualified as a special cause of the present depression. The keener powers of appreciation among the public engendered an increased demand for ancient furniture, &c., and this checked the production of modern goods. One of the employers, M. Lemoine, argued that the legal recognition of the trade unions would tend to ameliorate the situation. Professional schools should be created, every effort encouraged that tended to break down the spirit of routine and introduce the use of improved machinery. The *désiderata* of the employers he summed up in the five following stipulations—1. Revision of the local or town custom dues. 2. Protection of factory or trade marks. 3. Extension of the powers of the consular agents. 4. Suppression of the great public auction-rooms at the Hôtel Drouot. 5. Revision of the laws affecting the charges for transports and freights. In explanation of the fourth proposition, M. Lemoine stated that, in contravention with the law of 1841, new but badly made furniture was frequently sold at these auctions. This practice has become so general that there are manufacturers who work almost exclusively for the auction-rooms, and a judicial inquiry has been opened on the subject. During the course of the examination, it was also shown that the railway companies had imposed special charges for the transport of furniture. Indeed, it did not cost as much to bring furniture from New York to Bordeaux as to send furniture from Paris to Bordeaux, or from Paris to Marseilles. In conclusion, the delegates thought that the crisis, though severe, was not so acute as in 1875, and M. Lemoine declared that in spite of slight dissensions the workmen would always find their employers ready to help in every circumstance.

The delegates of the Cabinet-makers' General Association were also heard. This is a productive co-operative society, consisting of 140 members; but, at the present moment, the association is not able to employ more than one-fourth of its adherents. They reckon on the presence in Paris of 17,000 to 18,000 cabinet-makers, of whom a third part are foreigners. Out of the 18,000 workmen, 4,000 make luxurious and fancy furniture, 7,000 the current commercial furniture, and 7,000 the cheap ordinary goods. The first category of these workers receive 8d. per hour; the second, 5s. 10d. per day; and the third, 3s. 10d. per day. So much bad furniture has been produced of late, that the credit of French manufacture has suffered considerably. The delegates declared that they did not demand any privileges; they only desire to be on a footing of equality with the employers. They had participated in the contracts made by the town of Paris, and believed that the crisis would be appeased by the development of free associations.

THE "MANTEGNESQUE" SCHOOL.

Now that we hear so frequently of the new Mantegnesque School, or new Mantuan School, in reference to various pictures in the art exhibitions of the day, a few particulars concerning Mantegna may be of interest to some of our readers.

Towards the middle of the fifteenth century there lived in Padua a prosperous tailor and embroiderer, named Squarcione. He was able to gratify his natural taste for the arts by travelling in Greece, and collecting fragments of ancient sculpture. With these models, he established an art-school for the instruction of youths, intending, it is supposed, to confine their attention and skill to designs for embroidery; but ultimately he drifted into practice as a painter, when he made use of their services in more important undertakings. He is said to have instructed a hundred and thirty-seven pupils in the course of his career.

Andrea Mantegna was one of these youths thus taught by Squarcione. He was young and poor when the prosperous embroiderer registered him in the guild of Paduan painters; but he came speedily into high repute, for he introduced pale grey still fragments of ancient

architecture into his pictures, with veritable Greek inscriptions upon them, which charmed the scholars and antiquaries of the day, and led them to laud his productions to the skies. Ariosto, in the thirty-third canto of "Orlando Furioso," mentions him as one of the three greatest painters of the age,—

"Leonardo, Andrea Mantegna, e Gian Bellini."

After a time, Mantegna offended Squarcione by marrying the daughter of a rival painter, Jacopo Bellini, and we hear of him as working in Verona, and then in Mantua, where he painted a large chamber in the castle of Ludovico Gonzaga. In this apartment he brought into one characteristic composition angels, Cupids, gods and goddesses, blue heavens, white clouds, garlands, medallions, lunettes full of fables on golden grounds, with the portraits of his patron and family, charger, hounds, and attendants, besides fragments of architecture and landscapes. It was for this patron he produced the famous Triumph of Caesar, now in Hampton Court, which was intended for the palace of San Sebastiano, in Mantua, but was ultimately purchased by Charles I. It is full of antiquarian knowledge pictorially displayed, all the details of weapons, shields, helmets, corslets, vases, and other items being correctly given from antique specimens; and the triumphal cars, spoils, elephants, trophies, and spectators exhibiting his wonderful application of perspective. Word of the splendour of these works reached Rome, and induced Pope Innocent VIII. to send for Mantegna.

One of his first works in the Eternal City was the decoration of the walls and ceiling of a chapel in the Vatican, afterwards taken down when Pope Pius VI. added the Nuovo Braccio. Vasari tells us Mantegna wished to remind the Pope he had not been paid for his work, and, for this purpose, painted "Discretion among the Virtues." When his Holiness looked upon the figure he inquired what it meant, and replied, "If thou wouldst have Discretion well accompanied set Patience beside her." This new patron ultimately rewarded him handsomely, and sent him back to the Marquis of Mantua well satisfied.

Among other works Mantegna designed and built the church erected by the Marquis in honour of his victory over the French in an engagement on the river Taro, and afterwards painted a fine altar-piece for it, in which he showed the victor presented to the Virgin by St. Michael, St. Anna, and Joachim. This was one of the pictures removed to the Louvre by the French in 1797.

Andrea had two sons, who lived to afford him considerable artistic assistance. He built himself a good house in Mantua, which he embellished with paintings, both on the exterior and in the interior, and in which he is said to have maintained the condition of a cavalier till his death. Lorenzo de Medici visited his studio and employed him. Altogether he acquired a fortune by the exercise of his abilities. We learn from his will he founded a chapel, called the Chapel of Sant' Andrea of Mantua, and paid for a yearly mass to be celebrated in it, for ever, for the repose of the soul of his wife, Niccolosa Bellini. He died in 1506, aged seventy-five, and was buried in Sant' Andrea. This epitaph was placed on his tomb:—

"Esse hunc hunc novis, si non prorsus Apelli,
Rosa Mantine qui simulacra vides."

Thus the new art term, "Mantegnesque," must be interpreted to mean a reproduction of the style of composition of the most receptive of the pupils of the prosperous and art-loving Squarcione.

Proposed Industrial and Fine Arts Exhibition for Bristol.—It is proposed to hold an industrial and fine arts exhibition at Bristol next autumn, during the months of September, October, and November. Hitherto a great difficulty has been to obtain a site large enough and in a sufficiently accessible position, but by permission of the Council of the Bristol University College and of the Committee of the Bristol Blind Asylum, a large piece of ground extending behind the Rifle Drill Hall and the Blind Asylum, is now available for a temporary building, with ample space for machinery in motion, while the Rifle Drill Hall will also be utilised for exhibits and the racquet-court utilised as fine-art galleries. A guarantee fund of 4,000l. is asked for, and at an early date a meeting in support of the project will be convened by the mayor.

FURTHER NOTES ON BUILDING EXHIBITS AT ISLINGTON.

In our previous notice (p. 457, ante) of the principal objects on view in the Building Trades' Exhibition at the Agricultural Hall, we were, perforce, obliged, through their multiplicity and the exigencies of our space, to notice some of them very briefly. There are, however, several exhibits in some of the sections of interest to the building constituency and the general public, which call for fuller notice; and some others, hitherto unmentioned, which may be indicated as we pass on, even though we may not describe their features in detail. Though exhibitions of the kind under notice held less frequently, say triennially instead of annually, would afford a better stand-point for measuring the progress made, we must accept matters as they occur, and draw what favourable conclusions we can on behalf of all the legitimate interests concerned.

This year's display in the department of natural building stones, dressed and undressed, is very small compared with that of former years. The marble and ornamental stone applied in chimney-pieces and other decorations must, of course, stand apart. If the supply of natural building stones is somewhat scant, the deficiency is made up by a fair show and variety in artificial stone and concrete.

Of building stones, granite, and red, blue, and other limestones and sandstones, some good specimens are shown in the exhibition by Messrs. Wheeler & Hindle. A few specimens are dressed as applied for ornamental purposes. The Beasborough granite, of different colours, which, we presume from its name, is an Irish granite, is very hard in texture, and takes a good polish. The Dumfries stone dresses well. The exhibitors being quarry-owners as well as stone-merchants, are in a position for supplying a large assortment of stone for building, paving, and other purposes. An examination of the specimens of Bristol blue Pennant and Wycombe stone, shown by Free & Sons, convinces us that the former stone is suitable for a variety of uses. It shows very well as dressed ashlar, and exhibits an even and good surface in monumental work. Its composition, hardness, and durable qualities as a gritty stone render it applicable for kerbing, paving, and even common road metalling. Similar remarks may be applied to the materials supplied by the Mangotsfield Pennant Stone Company, who display slabs for railway-platform copings, paving, kerbing, &c. Mr. John Dean, though a quarry proprietor, has no display of stone, his quarries being apparently of slate, but what he exhibits in the way of large-size slabs for tanks or cisterns are of very good quality, and can be commended. The Velinell ton slates, and the Westmoreland blue and green, give forth a good ringing sound and exhibit in appearance and weight,—qualities that bespeak endurance. Though there are other firms who show a good selection of slates, and some slabs for cistern work, there is no necessity for details concerning a class of goods long in the market, and the qualities of which are generally known to the building world.

Of bricks and tiles there is a good display on the part of various firms, the principal of which we have already noticed. There is little very new in the brick or tile way in the present exhibition. The stands of Messrs. Rosher & Co., Broad & Co., and some others mentioned in our previous notice, exhibit in some instances a large and varied assortment of facing, place, stock, and other bricks, some hand-made, and more machine-moulded. Hand-made bricks are still much run upon by a number of builders. Though rough and ill-shaped in many cases, they are lighter than the machine-made article, and that is a consideration with a certain class of small builders who have the cost of cartage to consider, and for other reasons also well known to themselves. There are specimens of good gauged brickwork in the present exhibition, and of carved ornament in the same material. A novelty in brick construction is shown by Messrs. Smith & Son, in the employment of their patent bricks. These are made with projecting bands or rims flush externally with the face of the bricks, but rising, of course, a small distance above the level of their bed and abutting ends. The bands are about $\frac{1}{4}$ in. in breadth. The object is to reduce the visible joint without decreasing the thickness of the internal bed of mortar. From the specimen of the work executed and

in situ, the object appears fairly accomplished, and the features of the new system of close joints are worthy of attention. The Woolpit Brick and Tile Company have put up a small erection since our first visit to their stand, and this structure very well exhibits the excellent effect of work executed with their bricks, which are admirable in colour. Hall's patent hanging tiles are glazed tiles for reflecting light, so constructed that they can without difficulty be applied to existing walls of any material, where circumstances require it; for fixing to brick walls they are made to course with the bricks.

Of concrete work, classic, ecclesiastical, and domestic, the well-known firm of W. H. Lascelles & Co. present an unequalled display. The execution of the portico for the Wesleyan chapel of Lynn is exceedingly well manipulated in grey cement materials; balustrades, pedestals, and pilasters, the shafts or columns with their readings and flutings, the foliage of the capitals, and the entablature with its dentilled cornice, all must command praise considering the material of their construction. The two windows with double transoms, in reddish concrete, for the new wing of the Chest Hospital, City-road, are also well rendered. The enriched panellings and part of a large cornice, of light Mansfield colour, for a mansion in Westminster, also merit due commendation. The other work in concrete is the best of its kind, and if any contractor in concrete building deserves recognition for his enterprise and for overcoming no small difficulties in his special line, that individual is he whose excellent exhibits we have been noticing. The specimens on view by the Albion Concrete Company exhibit good handling and finish. The bay window in buff concrete, complete in its details, though temporarily erected, affords a very good idea to the ordinary public of the capabilities of concrete. The ornamental work, of which sundry specimens are on view, is fairly up to the mark. The exhibits in concrete material shown by Wilke's Metallic Flooring and Eureka Concrete Company are very noticeable. In addition to the paving specimens, columns in clusters, Gothic arches and arcade work, various ornamental strings, and a fireproof concrete door, are shown. This door is a rather massive and heavy-looking performance, though enriched with panels and moulded joints and enriched. The dimensions as given are 7 ft. 6 in. by 3 ft. 6 in. and 2 in. in thickness. We would like to know to what extent this strong-room door is burglar-proof, which is another matter for consideration not to be overlooked. *Re* concrete manufacture, Mr. A. C. Ponton, architect, of Parkstone, Dorset, presents some samples of artificial stone and concrete. He holds that his samples demonstrate that the former and the latter materials can be made with the minute quantities of cementitious matter binding together our natural sandstones. He thinks also that at least twenty times the quantities are at present wasted in concrete and stone manufacture. Less time is employed in the making and hardening of the samples, and it is contended there is no shrinkage in the manufacture. There are other advantages put forth, which, if fully realised by experience in the use of the materials mentioned, must contribute to their favourable reception. Of course we have by no means exhausted improvements in the manufacture of concrete and artificial stone, or approached the limits of their capabilities for application. Among other firms of exhibitors in artificial stone who claim notice for some very good specimens of manufacture, are the Patent Victoria Stone Company and the Imperial Stone Company. The goods of the former have been several years before the public, particularly their pavement, and we have a knowledge of its durable qualities. It has been extensively used in various districts in London, particularly in the eastern portion. The part of a staircase, shown in artificial stone by this company,—the same as supplied to residential chambers in Westminster,—shows a very good surface finish, and as far as we could examine it evidenced great hardness. Window-heads, wall coping, bases, pedestals, and a great variety of objects are made of Victoria stone. The Imperial Stone Company's exhibits, as a whole, are generally good, and the material is quite applicable to the sewer work, water piping, and hollow kerb for electrical and other purposes for which they are intended. We may interpolate at this point mention of the Patent Slate (*Débris*) Brick, shown also in the Banner Patent Hollow Kerb (for telephone and electric lighting wires), and the Hastings

Hydraulic Stone. It is claimed that the first is impervious to moisture, and that it is unequal for sewer, bridge, and other engineering work. The brick material is certainly very heavy and possesses great hardness, and, according to Kirkaldy's tests, it shows an actual crushing strain 1,056 tons to the square foot. The sanitary tubes made of this material are asserted to be cheaper and stronger than those made from earthenware, artificial stone, concrete, or other compounds. The Hastings "Hydraulic" building stone, "for all purposes," has been reported upon by members of the Institute of Engineers, who speak highly of its qualities. It is the invention of Mr. R. Holden Stone, C.E., of Melbourne, where it was first patented, and where it is stated to be largely used. The Hastings Company was the first established in England for the manufacture of this stone.

In the sections of Wood-working Machinery and Joinery there are some features worthy of fuller notice than that already given, but we cannot enter into lengthy details, respecting a number of exhibits. A careful inspection of the machines, stationary and in motion, the hand and the steam driven operators, reveals to us the fact that little new or by way of improvement has been accomplished since our detailed review of wood-working machinery in connexion with a former exhibition. It would be out of place, therefore, to go over the same ground again. The exhibits in this line by the well-known firm of F. W. Reynolds & Co. maintain their ground for compactness in make, and efficiency in execution. Of their saw-benches and moulding and mortising machines, whether in their simple or composite forms, scarcely anything additional can be said. We spoke before of the necessity that exists for the provision of cheap, compact, and efficient hand-working machines for the use of the numerous class of small builders that are scattered everywhere over the kingdom, and we again call attention to the *desideratum*. The general joiners and other steam-driven machines can only be profitably worked by large contractors who have always plenty of jobs on hand, but the small class of employers, by the aid of apprentices and labouring hands not otherwise employed, can experience no difficulty in providing the required motive power within certain limits. Easily worked hand wood-working machinery is a want far from being fully supplied. Messrs. E. Smith & Co., as on former occasions, display some efficient wood-workers, besides that valuable invention, Bowers' patent Separator, for intercepting and precipitating the mineral agents in the feed water of boilers, thus purifying the supply, and preventing the accumulation of the scale, that proves so disastrous. On the same stand is shown a novel mortising machine. It is an American invention, and the cutting operation is performed in a horizontal instead of a downward direction. The cutting tool is square, but hollow, in the centre of which revolves a centre-bit, or boring tool. Being pressed against the wood, the centre-bit clears out the major part of the sinking, the square cutting tool or hollow chisel pressing in simultaneously, and completing the perfect squaring of the mortise. It has yet to be seen whether this new novelty in mortising machines will make headway, and to what extent it will be generally applicable. Messrs. Lewis Lewis can be commended for some hand-feeding planing and panel-thicknessing machines, together with an effective machine for cutting circular mouldings. The automatic plane-iron grinder is capable of grinding cutting-tools up to 2 ft. wide. Sundry other exhibits on this stand all evidence good manufacture. Among the other wood-working machines, including circular and band saw benches, very efficient, though not possessing any new features, are those exhibited by Mr. E. S. Hindley and Messrs. J. Boyce & Co., respectively. Trier's Patent Grindstone Dresser is worthy of notice in connexion with wood-working machinery or cutting-tools, which naturally require grinding. The dressing apparatus is fixed on one end of the grindstone frame or stand, and, as required, it is made to move in a groove or plane transverse to the face of the revolving grindstone. The cutter attached for truing the stone is in itself a thin sheet of cast-steel, in the form of a cone. The revolving stone is met by the revolving cutter through the workman turning the handle of the dressing machine, the cutter traversing the face of the grindstone, and efficiently performing its work of truing. The whole operation to

sight is much more simple than we can make it by further description. The same exhibitor shows Stauffer's Patent Lubricator, a very efficient appliance, and most suitable for lubricating wood-working and various other machines. It is easily attached, and the lubricant used lasts for a considerable time.

In the department of ordinary and high-skilled joinery work there are sundry excellent exhibits, particularly those in connexion with stairs, handrailing, and doors with raised and moulded panels, the firms of Messrs. Lascelles and S. Ransom taking the lead. The massive wreathed mahogany handrail of the former firm is unexceptionally good of its kind. The moulding of the rail is appropriate, and in its construction, as far as we could examine it, is geometrically correct. The teak wood entrance-doors, and the other doors with the mouldings struck in the solid on the stiles, are well framed and cleanly finished. Indeed, the whole of the joinery work at this stand, including the wood chimney-pieces, the wall panelling, and other kindred work in hard and soft woods, deserves commendation for its superior execution. The portion of staircases from level to landing *in situ*, shown by Mr. S. Ransom, with the various forms of handrails starting from newels and scrolls, and executed in different hard and fancy woods, are excellent specimens of high-skilled joinery work in all their parts. We only object to the mahogany handrail, stretching from the scroll to a considerable way up the rail. This carving is, we think, quite out of place in a handrail, which should present an even surface for the hand to pass or slide over to the person ascending or descending the stairs. What we have said, however, in no way detracts from the general good workmanship exhibited. The inherent defects of the cylinder system in continued handrails are known to all experienced staircase hands, and from what we are presented with in Mr. Ransom's exhibits we think his workmen are able to cope with the difficulty, unless the plan should be radically bad. The house-joinery exhibits of Messrs. W. R. Crow & Sons in doors, mouldings, and patterns or lengths of the straight portions of handrails are good of their respective kinds. The joinery of the doors is well framed and cleanly finished, and the prices are remarkably low. The foreign joinery exhibits shown by two or three firms have little more than their cheapness to recommend them. Though fairly finished, the timber scantlings from which they are framed are very light, and as doors particularly are subject to constant wear and tear in many houses, a thicker scantling is desirable, to prevent warping and other ills that doors are heir to. A large amount of imported joinery work is, however, used at present in second and third class houses of the speculative kind. The ecclesiastical joinery exhibits shown by Messrs. Andrews & Co. in doors, sashes, frames, and panelling, are very good. The portion of a staircase, with its novel handrailing, and balustrading, exhibits skilled workmanship. Of fancy joinery, but more akin to cabinet-work, are the exhibits of "The Pliable Wood Decoration Company." Doors, panelling, dados, ceiling work, cornices, columns, mouldings, &c., are covered with a veneer of a very thin description. The work, although it presents an excellent finish, and can be produced in a variety of veneers of fancy woods, does not come exactly within the scope of regular house joinery. The system will, no doubt, be patronised to a certain extent, but it can never become general in house building and finishing. Two or three exhibitors show a very good assortment of plain and ornamental turnery, Messrs. M. C. Duffy & Son mostly in the former line and Mr. McCrerie in the latter. The spiral, oval reeding, and fluting specimens in hard and soft woods deserve recognition. The outcome of skilled labour at the lathe is widening, and much more may yet be accomplished in ornamental turnery by improved mechanism.

Among some miscellaneous exhibits to which we may refer we may name Grunzweig and Hartmann's "Cork-stones," which are composed of cork reduced to small particles or granules and cemented together with lime, the resulting combination being a hard though very light substance, suitable for use in many situations. This is a German invention. Garratt & Fowler's patent plumbers' gas-fitters', and painters' lamps, exhibited by Messrs. R. Morgan & Son, are likely to be much appreciated by workmen, as they can be used in any position for joint-making. Messrs. C. F. Whale & Co. exhibit what is called the "Perfect" sash-fastener, an

American invention which has some good points, though its title appears to be not quite justified. Mr. J. D. Tucker exhibits his water-tight sashes and frames, which deserve the attention of visitors. Mr. Chasles Kemp makes a large display of the Netherlton Enamelled Iron Company's street-name tablets, advertisement plates, &c. There is plenty of scope for the use of the former in several quarters of London. Messrs. George Waller & Co., in addition to the exhibits of which we made mention last week show their patent "side-entrance", or "man-hole" cover, which is a very clever and meritorious contrivance. It is so arranged that it can at pleasure be ventilating or closed, and in either case it is level or flush with the footpath, and forms no obstruction. With the side-entrance cover with safety grating in present use, when the door is opened a grating rises to the level of the path for people to walk over, but the door stands up like the lid of an open box, and in crowded thoroughfares it is needless to say this is inconvenient and dangerous. In the new patent cover the door is made with slot openings so as to form a close door. When men are below, or it is required at any time to be used as a ventilator, this grating (which is hinged on to the door underneath) is unfastened, and allowed to bang down. The door is then again shut, giving free ventilation, and forming no obstruction, being level or flush with the pavement. Besides its increased convenience, this arrangement obviates the necessity of keeping a man to watch the side entrance when the door is open and standing up. The cost is no greater than that of the old style of cover. Messrs. Waller & Co. also show a new ventilator for soil-pipes (Bancroft's patent). At the stand of Messrs. Josiah Wedgwood & Sons, already briefly noticed, many of the tiles exhibited are of the Marsden patent impressed description. By this process the exhibitors are enabled to use rich glazes, giving warm brilliant results, and they are able to carry out the designs of architects without the heavy expenses entailed by ordinary means for dies and moulds and modelling. The large panel, 10 ft. 8 in. high by 5 ft. 6 in. wide made for the Bristol Savings Bank, to the subject of the "Widow's Mite," is of tiles made by Marsden's process, and is a good example of bold outline drawing. It is from the design of Mr. Thomas Allen. Messrs. Lindsay & Co., whose constructive exhibits we mentioned last week, show one or two good specimens of ornamental wrought ironwork.

We have now more than exhausted our allotted space, but, though we have nowise used up all our notes, we must draw to a conclusion at this point. In doing so we will only further observe that, estimated by one or two exhibitions, though the progress in invention and in introducing new building wares has not been striking or remarkable, yet, gauged by what has been effected within the last decade, a decided and very appreciable advance has been made in sundry fields of our building industries. We repeat, however, that the exhibitions would have far more value and interest if they were triennial. They might then be really exhibitions of progress. Held annually, they tend to degenerate into bazaars.

WATER SUPPLY TO COUNTRY HOUSES AND ISOLATED PUBLIC BUILDINGS.

ARCHITECTURAL ASSOCIATION.

The tenth ordinary meeting for the present session of this Association was held on Friday, the 28th ult., Mr. Cole A. Adams, the president, in the chair.

It having been announced that the next visit of the members would take place this Saturday afternoon, the 5th inst., to the Hampstead Congregational Church, Mr. A. Waterhouse, A.R.A., architect,

Mr. W. E. Rich read a paper entitled "Water Supply to Country Houses and Isolated Public Buildings," from which we take the following:—

It has fallen to my lot to give considerable attention to the subject of water supply to isolated country mansions and public institutions during the last sixteen years, and, too frequently, I regret to say, I have only been called upon for advice when the building has been already nearly completed. I venture to think that the hydraulic engineer's opinion might, with most advantage, be sought at an early stage, when the exact site for the house is being selected and the general plans and elevations are under discussion, as it is a great gain

to have the house in proximity to a knoll higher than its roof, on which a reservoir of ample dimensions can be constructed, and in the absence of such natural advantages, a tower, capable of receiving a large elevated tank, higher than any part of the roof, should be a notable feature. The provision of water on the site selected should be also one of the earliest operations, as the cartage of water is often a serious item in a builder's estimate, and, in some cases, would help materially towards paying the cost of the permanent waterworks.

Before proceeding further, it will be, I think, desirable to consider briefly the most ordinary means of water supply. A direct gravitation supply from a natural spring or stream higher than the house is in every way the best when it is obtainable, as it is, frequently, in the hilly districts of the North and West of England, Wales, and Scotland, where the rainfall is large, and the rock surfaces are almost impermeable; but in the extensive and fertile districts of the South and East of England elevated streams are rare. The Earl of Kenmare's new house at Killarney is supplied from springs about one mile and three-quarters distant. They yield about 15,000 gallons per day, and are collected in a covered reservoir holding 30,000 gallons, and situated at an elevation of 110 ft. above the house floor; the water is conveyed thence to the house in a 4-in. cast-iron pipe, which bifurcates into fire-mains and service-pipes for drawing water direct all over the establishment.

When water is very scarce on high ground, material dependence has to be placed sometimes on the rain-water gathered from the roofs into large storage reservoirs, and it is well known in the West of England that the rainfall on the roofs of ordinary agricultural cottages will suffice for all requirements of its inmates if a moderate capacity of storage reservoir be provided. For large establishments so situated an artificial gathering-ground is preferable. At Sir Greville Smyth's, at Ashton Court, near Bristol, a half-acre plot of sloping ground near the summit of a hill behind the house is covered with a floor of impervious concrete with surface gutters for conveying any water falling on it to a 40,000 gallon covered reservoir below. For every inch of rain-fall upon this area about 8,000 to 10,000 gallons of water should be delivered into the reservoir.

When a gravitation supply is impossible there is no help for it but to have recourse to artificial pumping in some shape or other, and the several ways of pumping must be considered. The number of hand-pumps in the world probably exceeds that of any other machine, and most small private establishments in the country depend on such pumps for their water supply; but they are ill-fitted for large houses full of modern sanitary appliances and other apparatus for using and wasting water. A man working a hand-pump for an hour would scarcely do more than 60,000 foot-pounds of useful work in that time. One gallon of water weighs exactly 10 lbs.; so, if the water in the well is 100 ft. below that in the tank to be supplied, he will only raise 60 gallons in that time. Similarly, if two men work together, they will raise 120 gallons in that time; and, if the gross lift be only 50 ft., they will together raise 240 gallons, but even that is no more than a leaky water-closet will waste in twenty-four hours without being noticed.

The nineteenth century rebels against the employment of thinking beings as mere "drawers of water," and thus it is better to replace manual with horse labour or artificial pumping power in large establishments. Roughly, a horse would do about ten times as much as a man, or would raise about 600 gallons per hour 100 ft. Working six hours a day a horse would thus raise about 3,600 gallons, but he would not be fit for much other work afterwards in the same day. When a horse is employed it is better that he should be yoked into an ordinary pole horse-works, with a circular path from 20 ft. to 24 ft. diameter, and he should thus drive three-throw pumps walking two miles and a half per hour. Twenty years ago an American type of horse-works, in which the animal stood on an endless band and pressed it backwards beneath his feet, was much employed, but they were found to be very dangerous, and many excitable horses were killed or ruined in working them. Mules and donkeys are frequently used similarly for

pumping, and considering the sorry fare which contents them are probably more economical *pro rata* than horses, where a small power only is required.

The appliances for water-power pumping are numerous, but it must be borne in mind that to make water-power feasible we must have a material volume and a material fall. One of the most efficient and simple in its details is the hydraulic ram. Ordinarily it raises a portion of the water which works it, and in action a large quantity of water in expending its energy on a small fall raises a small quantity on a high lift.

The efficiency of a ram rises to from 60 to 70 per cent., but for safe estimating I generally allow 50 per cent. efficiency.

Supposing 20 gallons a minute, falling 12 ft., are applied to work a ram; then I can easily raise $\frac{1}{2}$ of $\frac{20 \times 12}{100} = 1.2$ gallons per minute

$= 1,728$ gallons per day, with it. The late Mr. Easton, the founder of my firm, brought the ram patent to England in 1821. Rams using dirty water and raising clean are sometimes used, but they are complicated, and give frequent trouble.

A water-wheel driving pump is a convenient and very efficient arrangement when the fall does not exceed 12 ft. In an overshot wheel the water is discharged into buckets near the top of the wheel, and the full buckets on one side overbalance the empty buckets on the other, and drive the wheel round. Generally a set of three-throw pumps is driven by wheel-gearing from the wheel shaft.

Suppose a wheel 10 ft. diameter, with twenty buckets, receives water at 1 ft. below the top, and discharges it 1 ft. above the bottom, and each bucket holds 1 gallon of water, then, neglecting the velocity of the flow, the gross work done on the wheel per revolution is $20 \times 10 \times 8 = 1,600$ foot-pounds. Supposing the efficiency of the water-wheel and pumps together be 40 per cent., then there will be 640 foot-pounds per revolution of wheel available for pumping, and the water raised per 100 ft. at ten revolutions of the wheel = 6.4 gallons per minute.

An undershot water-wheel is less efficient, but very convenient for utilising low falls; and those of the Poncelet type, with curved blades, will work well with falls as low as 1 ft. only.

A turbine is a water-wheel of special type, with a vertical spindle, and is, I consider, one of the most efficient and interesting power-machines I know. It is very small and compact, and can be used for high falls up to 100 ft. to 200 ft., as well as falls of 2 ft. or 3 ft., and it will work when the tail is flooded. A 20-h.p. turbine on a 100-ft. fall would only be about the size of a dinner-plate.

After water-power for pumping, windmills should be considered; but wind is a very uncertain agent in this country, and the seasons when most water is required are often the calmest.

Steam-engines are generally applied to work three-throw pumps, and can often be arranged to do other duties on an estate, such as sawing and driving farm machinery, &c. A 4-horse-power engine, using 3 cwt. of coal, and driven by a boy, will do as much as ten horses in a day. Portable engines can be shifted about for other duties, but as a rule, fixed engines, with large Cornish boilers, suited for burning refuse wood, are preferable for permanent pumping works.

Gas engines, when an estate has its own gas-works, have the advantage of being ready for starting at any moment. They are rather complicated, but are improving constantly.

Pumps, as a rule, should be three-throw whether vertical or horizontal.

As to tanks, the lecturer went on to say, one was better than a large number, which were a danger to health, as each might accumulate a certain quantity of filth. The water should be kept in the dark as much as possible, because, if exposed to the light, it would encourage the growth of vegetable matter. He always sought an elevated point above the house-top, constructing a reservoir there in brick and cement. This, if well constructed with side walls and earth backs, would last intact for 2,000 years, good cement getting harder and stronger as time went on. Where he wished height for a reservoir, he made it circular. Such reservoirs cost from 10l. per 10,000 gallons, to 5l. per thousand for 100,000

gallons. The pipe for conveying a spring to the reservoir might be comparatively small, but from the reservoir to the house a larger pipe was requisite. As to constant service, in London we only received water for an hour or two every morning, but all modern waterworks had water in the pipes under constant pressure. The great thing was to draw water from the main without its passing into any subsidiary tank, as there was then no risk of contamination. In these days there was more danger of fire than in years gone by, and the best provision against it was a tank of ample dimensions, a large main from the reservoir to the house, a series of hydrants outside, and fire-locks inside.

Water-power could be applied to the working of hydraulic lifts for coals or luggage, and these lifts were also a great luxury to those who were unable to walk up and down stairs. Small hydraulic lifts could be used for dinners and other purposes. At Eaton Hall there were seven lifts of various sorts, one of them coming close to the drawing-room for carrying beds and other things, and others of considerable dimensions for taking up ladies' boxes. There was no reason why water-power should not be utilised in the kitchen for turning the spit, while if there was plenty of water and a good pressure, a man might have a diminutive turbine to work his lathe or blow his organ. It was better to dispense with filtration if possible, for unless carefully carried out it was a source of danger rather than of benefit. A filter required periodical attention, and every portion of its contents must be renewed. The animal charcoal filter did very well for a short time, but if left unattended to for a couple of years it would become filled with animal organisms to an alarming extent. Perhaps the only effective agent for dealing with organic matter was spongy iron. Water sometimes contained iron in solution, which caused inconvenience, and the proper way to deal with this was to expose it to the air. The Clark process was an arrangement for depriving water, containing carbonate of lime and magnesia, of its hardness. This apparatus was better suited to deal with water on a large scale, but it was possible to use it on a smaller scale. Some people considered hard water unwholesome and liable to cause stone and other diseases, but he had the authority of Dr. Tidy for saying that there was no inconsistency on record of stone being caused by the use of hard water, and he doubted whether it was not more wholesome than soft. With regard to the quantity of water required in houses he was afraid this was a difficult matter to settle. If care were taken of it a small quantity would suffice, but allowance had to be made for a great deal of waste, and water in abundance was a luxury. Where he could get it on reasonable terms, he liked to provide a large country house with fifty gallons per head of its inmates, fifty gallons per horse in the stable, and 600 gallons per acre of garden per day, with an ample addition in case of fire. In reference to the sanitary arrangements for water they had to see that there was no contamination, and to have a covered reservoir of some material which would not affect the water. The lecturer explained, by means of drawings, the water supplies at Killarney House, Hindlip Hall, Liphypark, Clumber, Goldings House, and other places, and the special fire service arrangement in Worcester Cathedral.

Professor Kerr, in opening the discussion, considered the lecture one of the best he had ever listened to, and as a member of the society upstairs, he envied them having such lectures. They heard a great deal in the architectural world of the variety of pipes within a house for supplying the necessities of its inmates, and he believed they had a great deal too many pipes. What with the gas, and heating and water supply, the houses of the present day seemed fuller of pipes than of anything else. The result too often was that this multiplicity of pipes kept the family in continual hot water. It was to our discredit in this country that we did not value a water supply sufficiently. The condition of the water supply of London was a disgrace. When he thought of the supplies of Glasgow and New York, and compared them with the wretched supply of the metropolis, it was scarcely possible to conceive how the public of London could submit to be so ill-served in this respect. Take the case of a small house, and see how simple an affair a complete supply became. The first requisite was to provide a reservoir, either outside or inside, and from

some source or other water must be brought to it. This could be done without difficulty if people would only go the right way to work, not depending upon filtration or other artificialities. It should be brought to the house and distributed over it in a simple manner, avoiding complications, and providing merely for the necessities of the inmates. The speaker concluded by proposing a cordial vote of thanks to the lecturer.

Mr. Riddett seconded the vote of thanks. He was interested to learn that the smaller reservoirs worked out at something like 2½d. a gallon. In comparing the different tanks, there was a great advantage on the side of bricks and mortar. He was glad to notice the ample allowance of water per head, viz., 50 gallons. In towns 30 gallons per head was what the water engineer generally allowed. The waste-preventers now in use really added another pang to existence, and, in his opinion, they were all bad.

Mr. Eastman asked if the spring arrangement for fire extinction in Worcester Cathedral had ever been tested? It was a very old idea, and it had been pressed upon him in connexion with the theatre at Eastbourne; but he had gone minutely into the question, and found there was great danger of flooding the place when there was no fire. In Drury Lane Theatre they would find a large sprinkler arrangement over the stage, but the great drawback was in testing it. He believed that in course of time the arrangement would become clogged. In America the automatic sprinkler had often been a failure.

The vote of thanks was then put and carried by acclamation.

Mr. Rich, in replying, said that cast-iron tanks should not be very deep. A cast-iron surface would last longer than a wrought-iron one; but it was a treacherous material, and all flat surfaces had to depend on wrought-iron stays, which were liable to corrosion, especially in soft water. These considerations led him to prefer circular wrought-iron riveted tanks of a good thickness, which required no stays, when large capacities were required. Tanks were sometimes exposed on the tops of buildings, which was a very proper place for large ones, if they were covered over, but it was necessary then to guard against the action of the wind affecting them. He had used concrete reservoirs on several occasions. In putting pipes in houses it was his custom to use cast-iron or wrought-iron steam piping. He agreed that waste-preventers were an annoyance, and were only necessary when defective or inferior water-fittings were used. Simplicity was the first principle, and the fewer pipes, tanks, and fittings there were in a house to fulfil a given duty the better. The introduction of the arrangement he had referred to in Worcester Cathedral was due, he believed, to Canon Barry, who felt the great risk the old structure ran in having so much woodwork without protection. The sprays alone were not relied upon, but they were something, and there were also fire-cocks all the way downstairs, which could concentrate a strong jet on any point. The sprays had been tested, in the first place, over the woodwork in the tower, and they could be tested at any moment by reversing the jets, when a shower of water came through the louvres, and ran down outside the tower. The internal area of the tower was vastly smaller than that of a theatre, so that the apparatus in question was more applicable in this case.

Large Sales of Building Estates.—There were several sales of valuable suburban building estates at the Auction Mart last week. Messrs. Debenham, Tewson, & Co. submitted to competition the Norbiton Hall Estate, near Kingston. The estate, which is freehold, contains 14 acres. There were several competitors for the property, which was sold for 10,820l. Messrs. Baker & Sons offered for sale the Duncald Estate, situated at Wimbledon, close to the railway station, and containing 38 acres of freehold building land. The auctioneer described the estate as forming one of the choicest building sites in the locality. He observed that it was connected with the main drainage system. The estate, which was offered in one lot, and included several old-fashioned residences now on the land, was sold for 28,000l., being at the rate of about 750l. per acre. Mr. Reid also offered the West Grove Estate, at Walton-on-Thames, containing eight acres of freehold land, which was sold for 4,000l.

ADMIRALTY AND WAR-OFFICE COMPETITION.

In view of the rather unexpected result of the first competition for this important building, we beg to say that if any of the leading architects of the day who may have competed are desirous of appealing to public criticism, we shall be happy to give them the opportunity of doing so by publishing their designs at an early date.

THE EXAMINATION IN ARCHITECTURE.

At the Royal Institute of British Architects the following gentlemen, who have passed the recent examinations in architecture, held respectively in London and Glasgow, are qualified to become candidates for Associateship, namely:—

Alexander McGibbon, Glasgow; James Anderson Williamson, Edinburgh; Alexander B. Wilson, Brisbane, Australia; James Ledingham, Bradford; Charles Mason, Nottingham; Thomas Frederick Pennington, London; William Henry Radford, Nottingham; Joseph Addenbrooke Saunders, Folkestone; Charles Harvey Heinrich Cazalet, London; Arthur Crow, London; Richard Malone Hamilton, London; Lionel Thomas Waller, High Wycombe, Bucks; Harry Anderson Paley, Lancaster; Samuel Hurst Seager, Christchurch, New Zealand; Andrew Whitford Anderson, London; Robert John Beale, London; Frederick J. Banister, London; John Bevan Phillips, Epsom, Surrey; John Moir Kennard, London; Walter John Nash Millard, London; Hedley John Price, Nottingham.

Of the above, the four who held this year examined in Glasgow, and the remaining seventeen in London.

DETAILS OF AMERICAN CONSTRUCTION.

The details of iron construction, which we give this week, are from what is called the "Barge Office" at New York, a structure intended for landing passengers and examining luggage from ocean steamers, and to which special reference is made in Mr. Gale's paper, reported on page 421, *ante*. The first sheet shows the details of the staircase construction, and the second one shows the iron standards and window fittings in plain and vertical section. On the plan, the use of the corrugated iron as a facing or skin will be observed. It is a curious kind of building to English architects, with iron skins twisted and bent into the sections usual with stone mouldings. The stair details exhibit very careful working out of detail drawings.

WIRRAL CHILDREN'S HOSPITAL.

This building is situate in Woodchurch-road, Birkenhead, and is intended to serve the whole district of Wirral, which embraces the peninsula lying between the rivers Mersey and Dee. The site contains about one acre.

The exterior is of Rusbon red bricks, with Runcom red stone dressings and terra-cotta enrichments, with traceried work in vestibules by Messrs. J. C. Edwards & Co., Rusbon. The roof is covered with red tiles.

Accommodation is provided for about forty in-patients in four wards, two large fourteen-bed, one eight-bed, and one four-bed, the latter to act as a separation for infectious or contagious cases. The wards are lined to about 5 ft. high with glazed bricks, and above this with selenitic cement. The ceilings are also of cement; the floors are of narrow pitch-pine battens, secret-nailed and wax-pollished. The bathes are wrought iron. The corridors are all fireproof. A large out-patient department is provided, and an administrative department sufficient for double the present requirements. The nurses being ladies, each has a separate bedroom.

The baths, sinks, &c., are all of glazed fire-clay. The drains are thoroughly ventilated, and have been laid under the advice of Sir Robert Rawlinson, C.E., C.B., who very kindly gave the architect his assistance.

One of the large wards has all the lights above the transoms, twenty-two in number, filled in with stained-glass illustrations of popular nursery rhymes, by Ballantines, of Edinburgh, and Holloway, Liverpool.

The heating, ventilating, grates, ranges, mantelpieces, and ironwork generally, were executed by Messrs. Bennett Bros., of Liverpool, who also supplied the wrought-iron and

bronze vestibule gates. Messrs. A. Bleakley & Son, of Birkenhead, were the builders, and Mr. John Clarke, 19, Castle-street, Liverpool, was the architect; Mr. A. Clarke having the charge of the building.

This building was opened by the Duke of Westminster, K.G., in June last, when the patients were removed from the old hospital in Orton-road, and is the third one since the foundation of the charity. As soon as funds will permit it is intended to add the other wing, which will double the accommodation for in-patients.

The frontage faces west, the three main wards face north and south, and all get a south view. Many of the special features, such as stained glass, gates, wrought-iron lamps, &c., have been gifts; the total cost, exclusive of these and of land, has been about 9,000l.

ROWALLAN CASTLE, AYRSHIRE.

This castle is beautifully situated about four miles from Kilmarnock, and is partly ruined, one or two rooms only being occupied. It bears the date 1643,* but parts of it must be much earlier, as it was the birthplace of the Queen of King Robert II. of Scotland. It is built on the sloping side of a high mound, and has, therefore, a basement-story on one side only. The courtyard is, we may say, on the first-floor level, and is reached by a long flight of steps which ascends from the ground level outside upwards between two circular flanking towers, pierced by loop-holes and windows. At the top of this stair is the main entrance,—a low-arched opening or doorway from which an arched passage runs right through the front buildings to the courtyard at the back. Rowallan is a well-known and interesting old place, and contains many things which deserve attention. There are a number of fireplaces, a quantity of wood wall-panelling, some good carved oak work, such as wall-cupboards, screens, wardrobes, table and chair, stair balusters, and a notable carved oak door. Externally there are some good Scottish masonry details, chimney-stacks, doorways, water-spouts, corbel-steps, &c., and an excellent ruined gateway in the outer wall. The castle is built of reddish stone, which imparts to the building a rich, warm colour, making it a favourite subject for landscape-painters. The date, initials, and crest are similar to those on the neighbouring old parish church at Fenwick, and show it to have been at one time the property of the family of Muir.

JOHN C. T. MURRAY.

UPTON CONGREGATIONAL CHURCH AND SCHOOLS.

The plan of this church, of which we give an illustration this week, is based on a Latin cross. There are no seats in the side aisles, so that all seats being within the nave and transeps there is an uninterrupted view of the preacher. There are sittings for 872 persons on the ground-floor, and for 328 in the west and two transept galleries, making 1,000 in all. The walls are built of brick and concrete, and faced with split flints. All the dressings and internal stonework are of artificial stone, manufactured by the Eureka Patent Stone Company. It is coloured to imitate St. Bees red sandstone. The church will be warmed by hot air and lighted by pendent cornices.

The block of buildings comprises church, lecture-hall, and other rooms attached, and Sunday-schools, young men's and young women's clubs, and caretakers' residence. The schools are novel in design. They are hexagonal in plan, with class-rooms on three sides on the ground-floor, and on five sides on the first floor. These all open into the body of the school. The roof and clearstory of this school is supported on iron columns.

The infants' school is of similar shape, separated from the main school, so that their more noisy exercises may not disturb the other scholars.

The lecture-hall and vestries have cost 2,300l. The contract for the church amounts to 5,000l. The schools are not yet contracted for. The architect is Mr. T. Lewis Banks (now T. L. Banks & Townsend), of 23, Finsbury-circus, and the contractor Mr. Charles Sharpe.

* So in Mr. Murray's letter: though it will be observed that the elevation of the gateway in the drawing bears the date 1661.—E.W.

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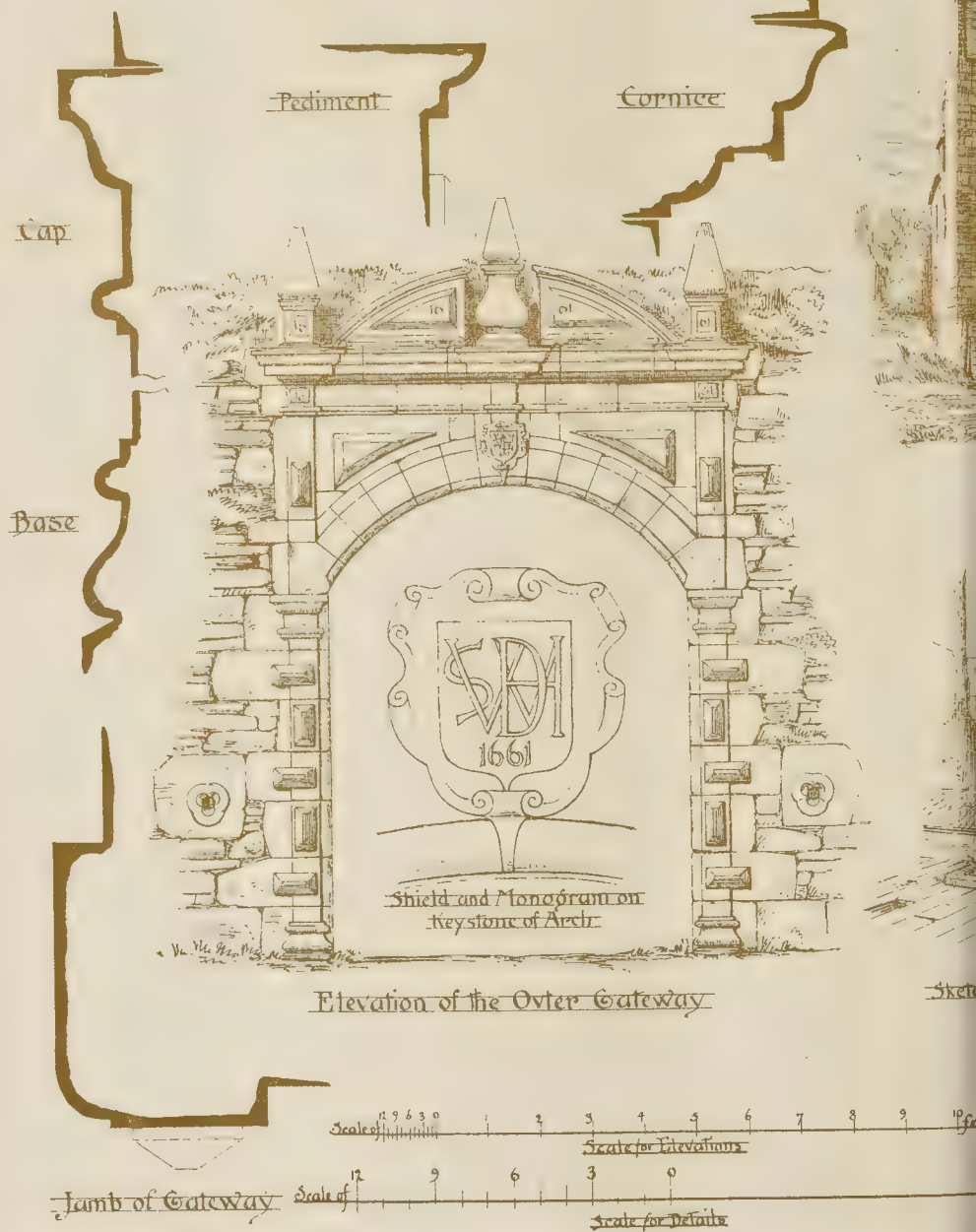
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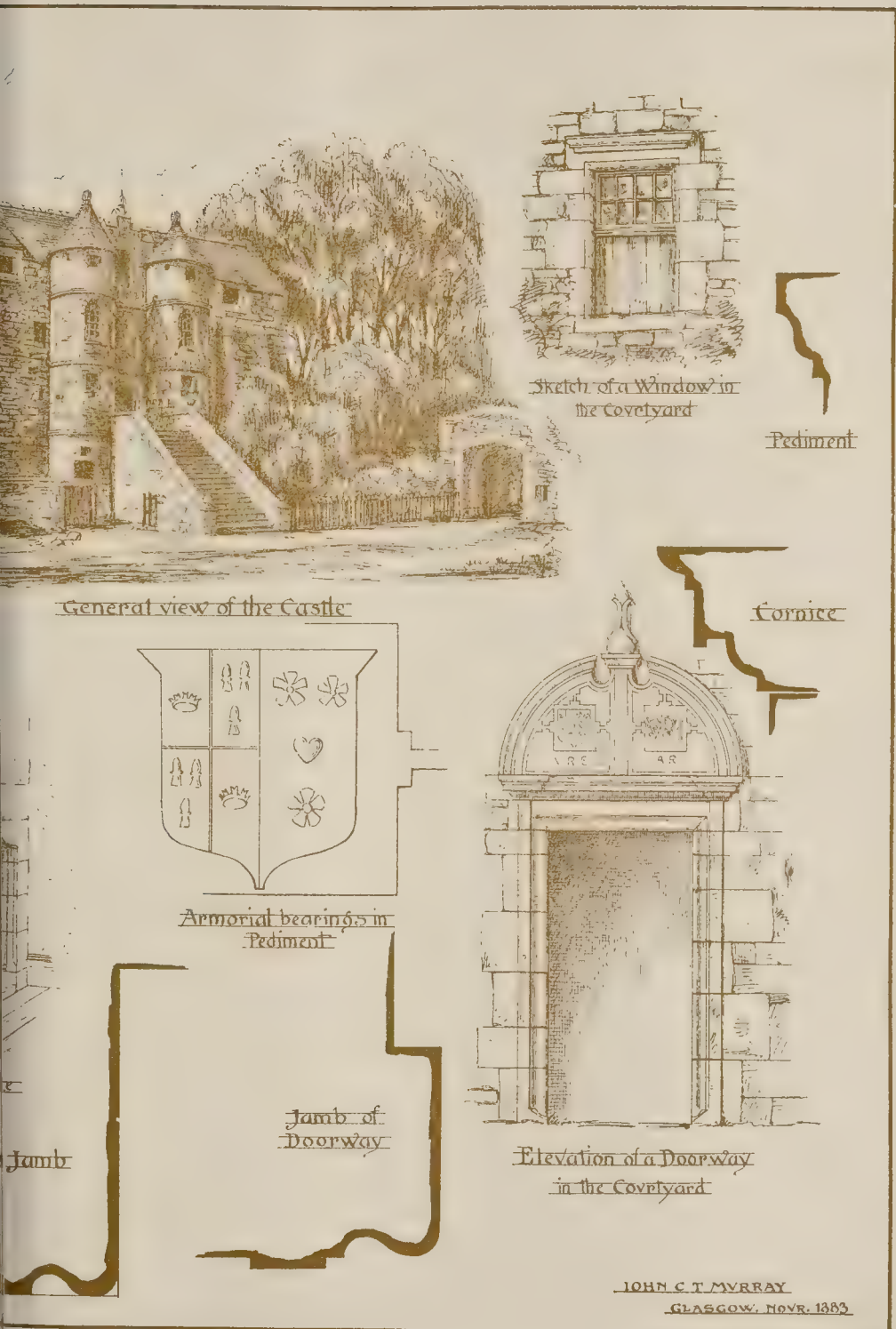
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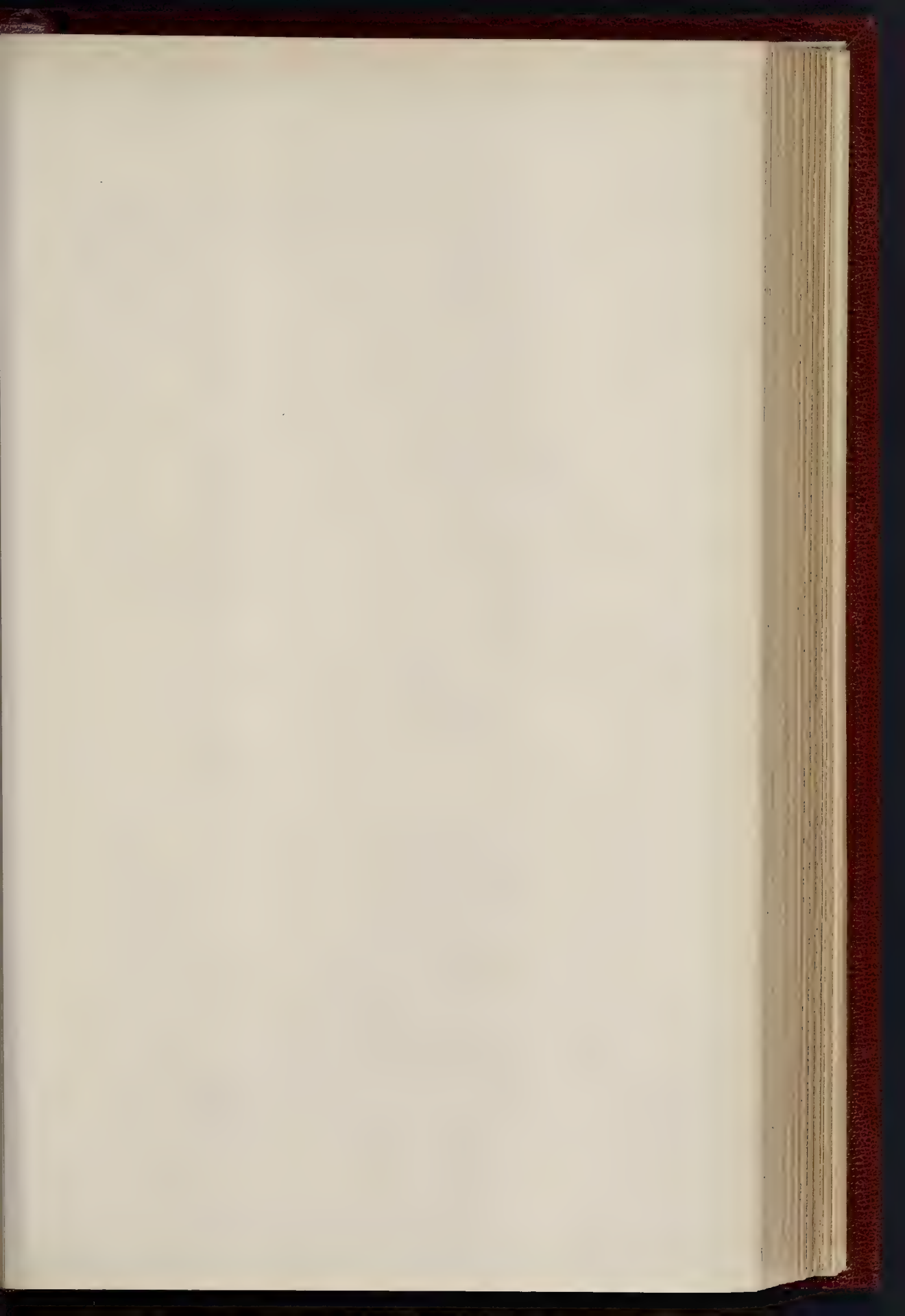
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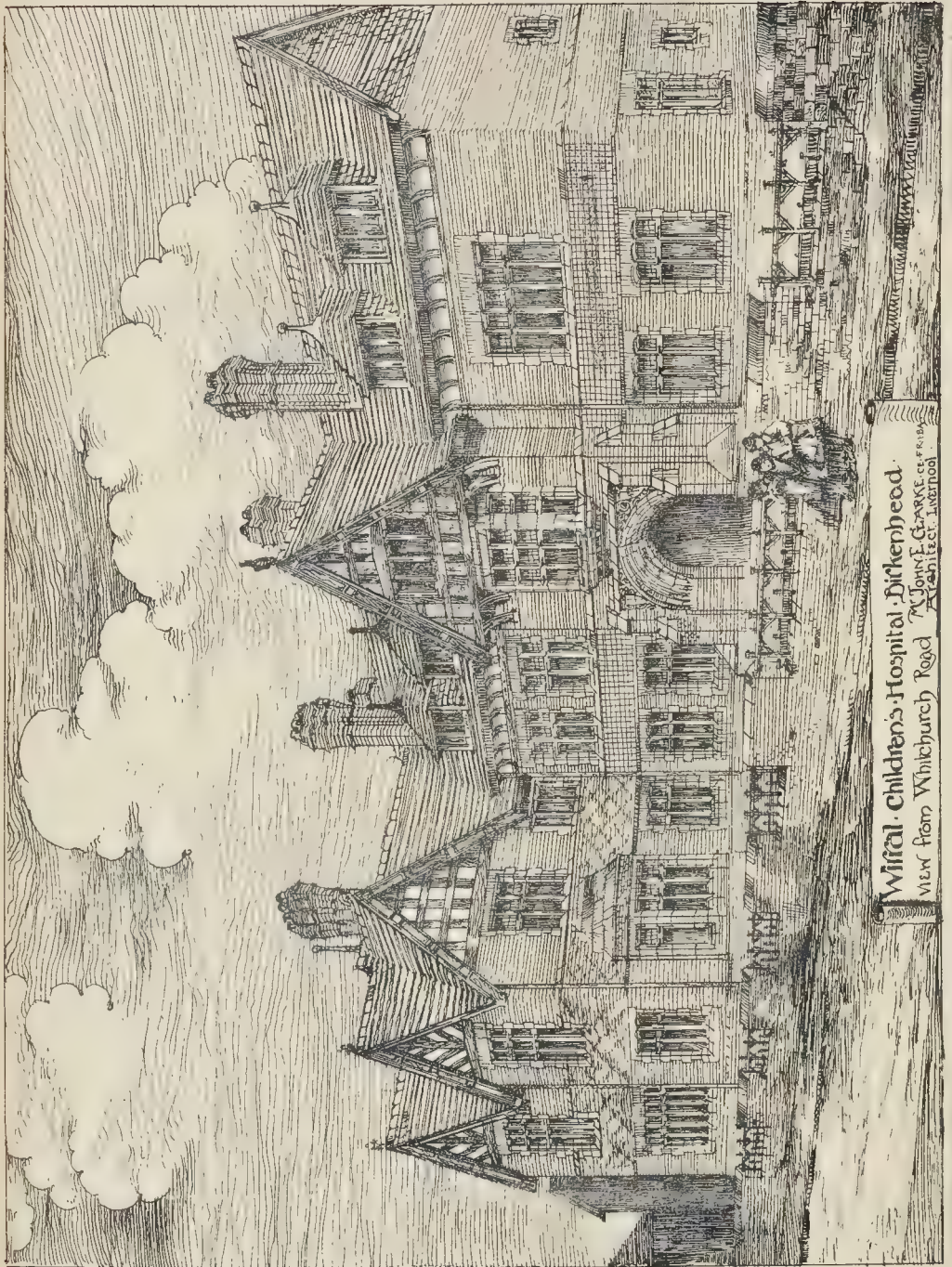
ROWALLAN CASTLE

NEAR KILMAVRS. AYRSHIRE.

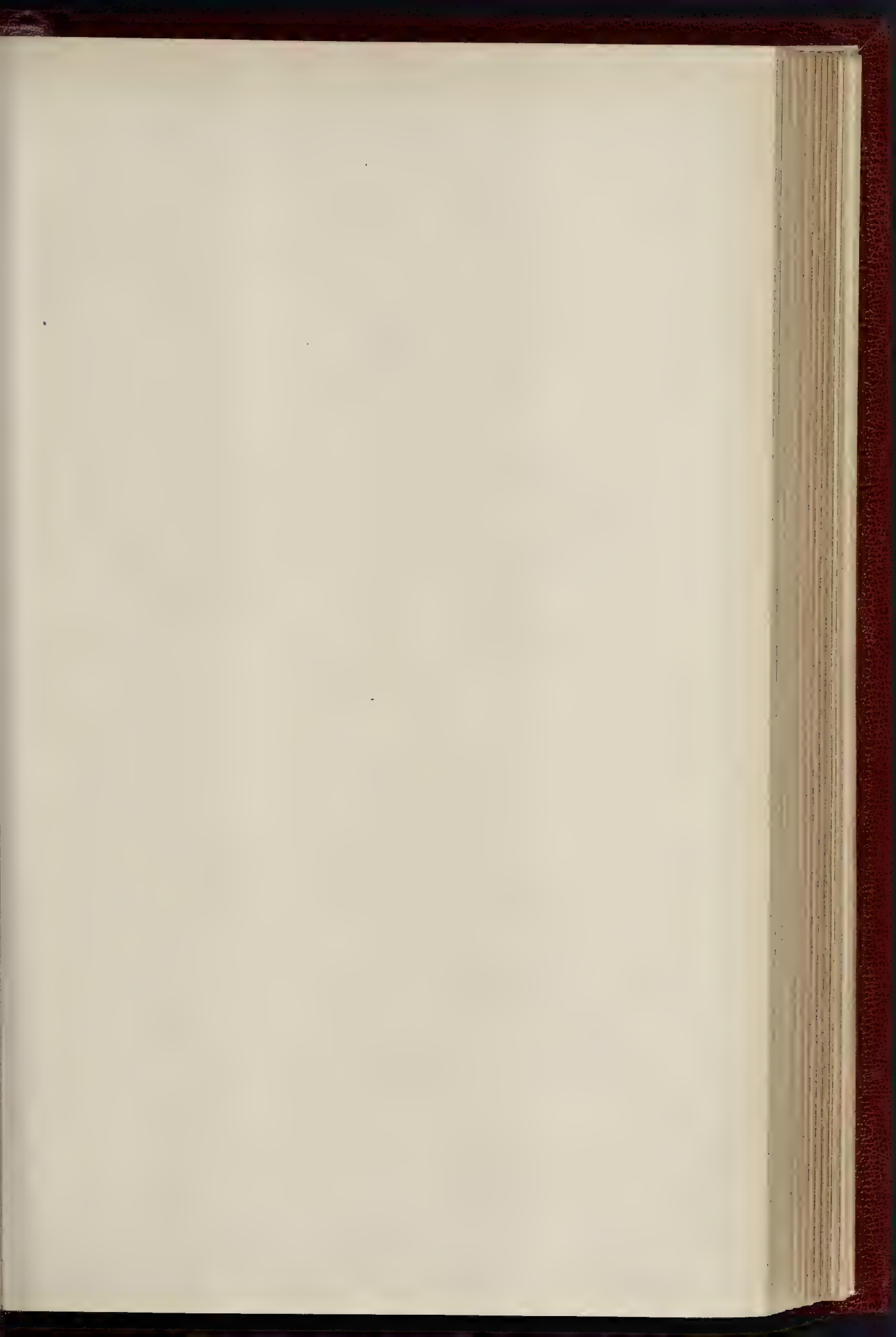








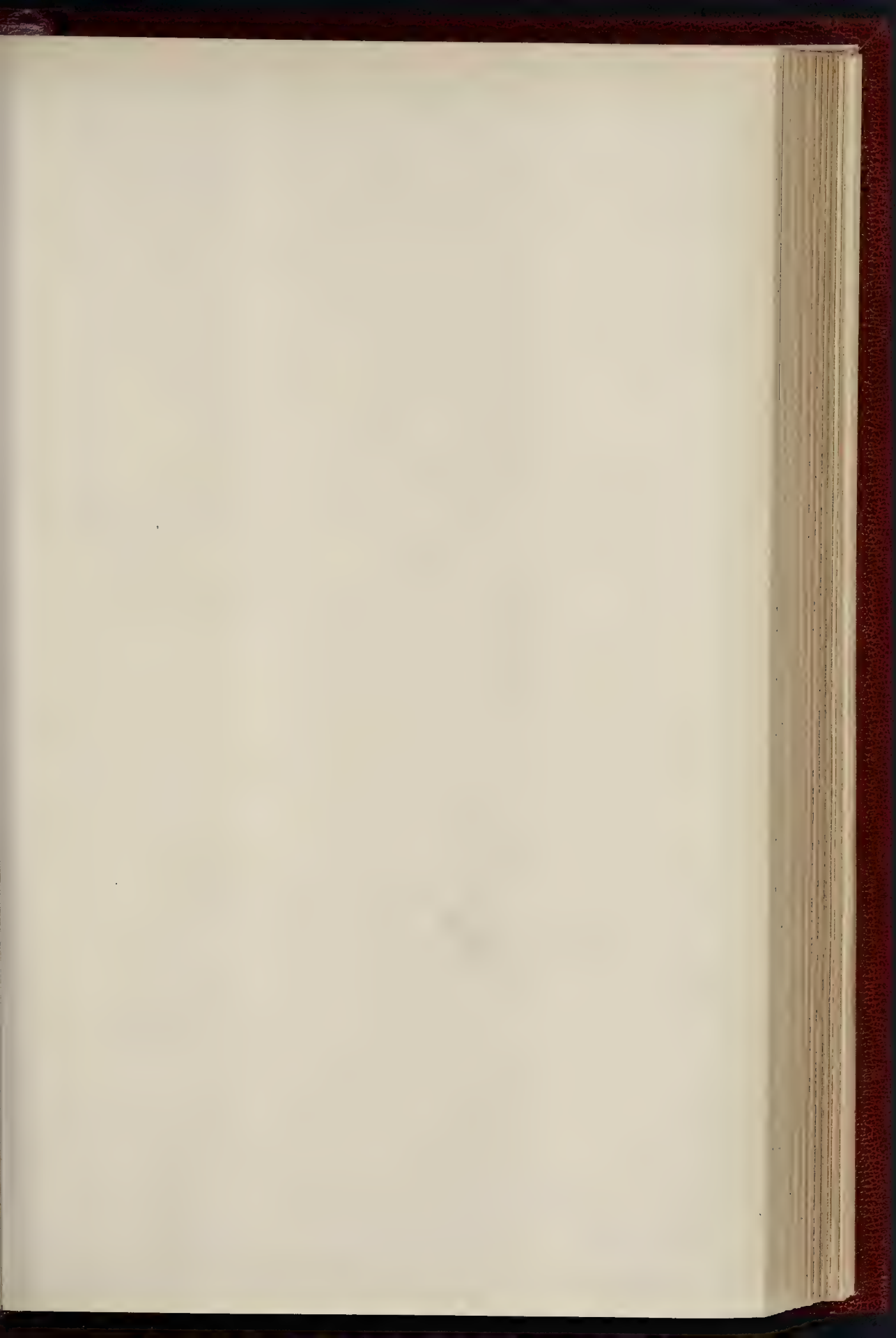
Whistal Children's Hospital, Dickenheod.
View from Whichurch Road.
Architect, London.



GROUND PLAN

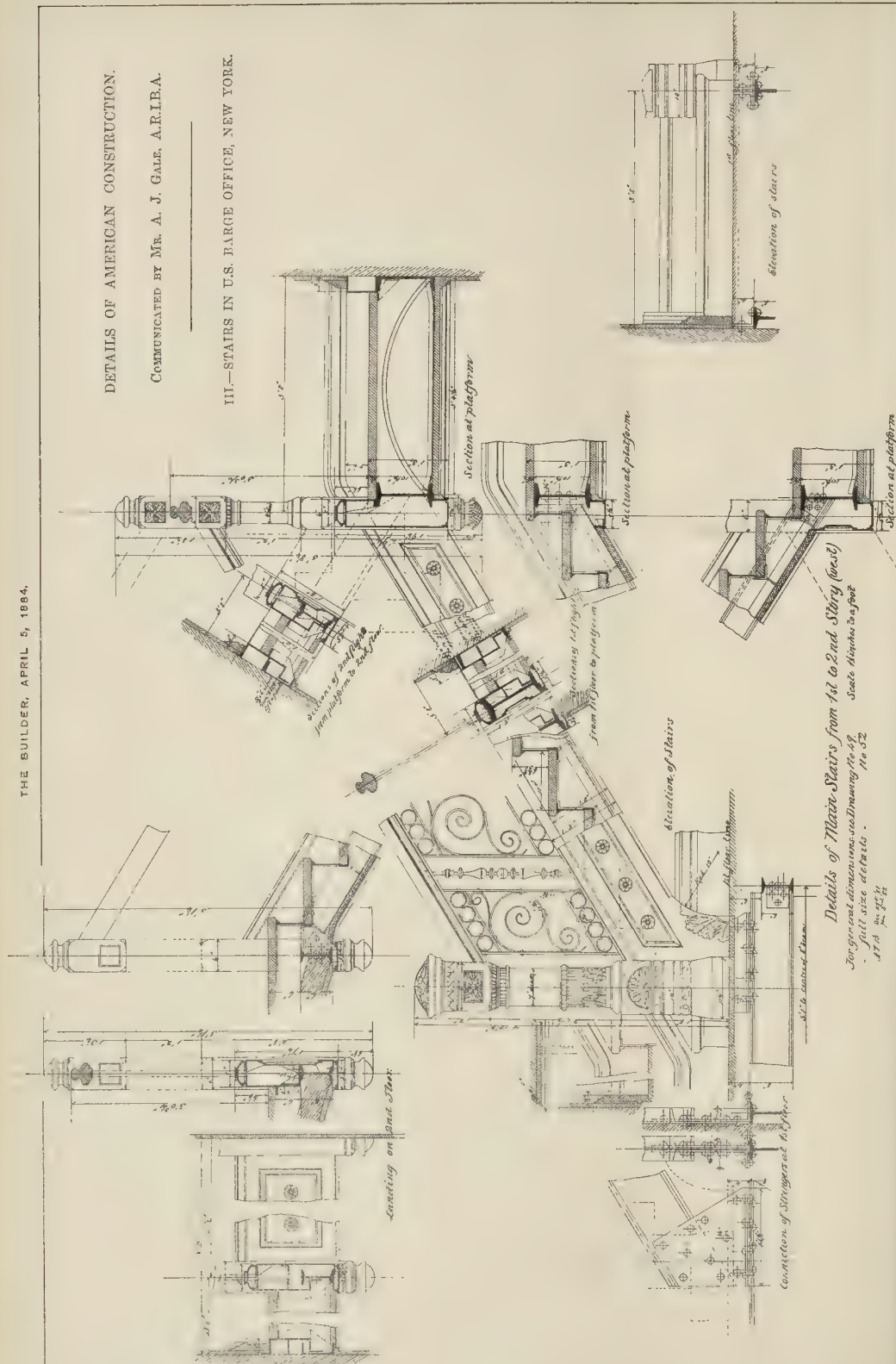
Architectural floor plan of the first floor of a hospital building. The plan shows three wards (Ward No. 1, Ward No. 2, Ward No. 3) and various support rooms. Ward No. 1 is at the top, containing a bath, toilet, sink, and linen closet. Ward No. 2 is in the middle, containing a bath, toilet, sink, and linen closet. Ward No. 3 is at the bottom, containing a bath, toilet, sink, and linen closet. A central corridor connects the wards and other rooms. Other rooms include a ladies' sitting room, a ladies' superintending room, a nurses' common room, a nurses' room, a kitchen, a storeroom, a linen closet, a bath, a toilet, a sink, and a linen closet. A north arrow is located in the upper left corner.

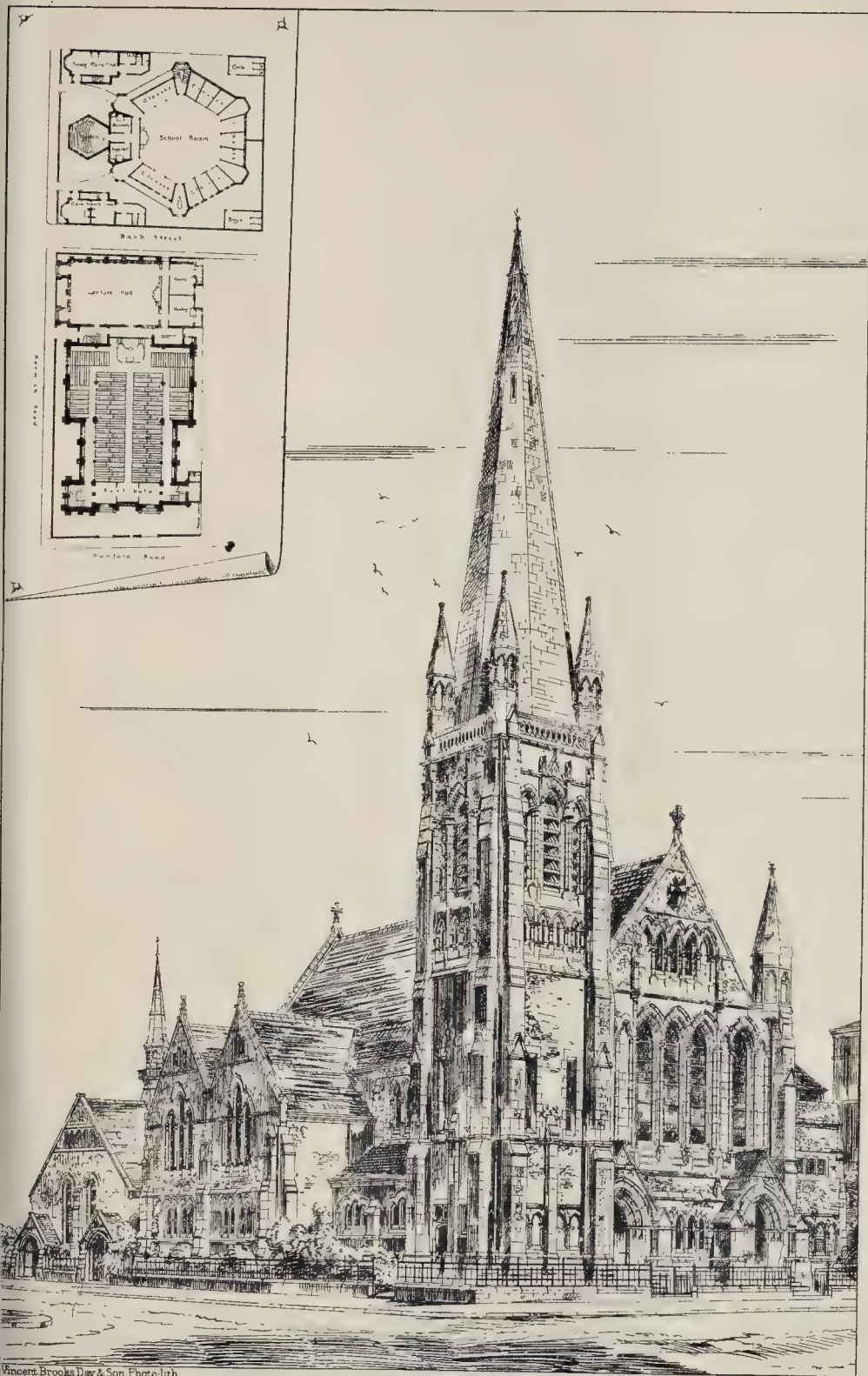
Vincent Brooks Law & Co., Limited



COMMUNICATED BY MR. A. J. GALE, A.R.I.B.A.

III.—STAIRS IN U.S. BARGE OFFICE, NEW YORK.





UPTON CONGREGATIONAL CHURCH—MR. T. L. BANKS, A.R.I.B.A., ARCHITECT.



Wirral Children's Hospital.
Mr John E. Clarke & Co. F.R.I.B.A.
Architect Liverpool

of the year 1871

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THE REGULATION OF THEATRES
AND MUSIC HALLS.

A BILL has been introduced into the House of Commons, by Mr. Dixon-Hartland, to provide for the better regulation of theatres and music-halls within the metropolitan area. The preamble recites that the present system of double jurisdiction under which certain theatres are licensed by the Lord Chamberlain and the music-halls by the magistrates is inconvenient and unsatisfactory, and that it is desirable to place the entire control of such places in the hands of one officer of dignity and position. It is proposed to abolish the Acts of the 25th of Geo. II., chap. 36; the 2nd and 3rd Vict., chap. 47, sec. 46; and the 6th and 7th Vict., chap. 68, sec. 2, but the existing censorship of the Lord Chamberlain is to be retained. The entire control of all theatres and places of public amusement is placed under her Majesty's Secretary of State for the Home Department, who is to be empowered to frame such regulations as he may think fit for the establishment of decency and order, and to insure the safety of the public. The Home Secretary is further empowered to appoint a sufficient number of inspectors to survey and continuously inspect all places of amusement. Any person infringing the regulations is to be liable to a fine not exceeding 20*l.*, and a further penalty, not exceeding 5*l.*, for every day the offence is continued. A power of appeal is provided, but the tribunal to whom it is to be made is not stated.

The Act of George III., which it is proposed to repeal, is entitled, "An Act for the better Prevention of Thefts and Robberies, and for regulating Places of public Entertainment, and punishing Persons keeping disorderly Houses," and was passed in the year 1747. The second section recites that "the multitude of places of entertainment for the lower sort of the people is a great cause of thefts and robberies, as they [meaning the lower sort of people] are thereby tempted to spend their small substance in riotous pleasures, and in consequence are put on unlawful methods of supplying their wants and renewing their pleasures." In order to prevent these mischiefs, it is enacted that from and after the 1st day of December, 1752, any house, room, garden, or other place kept for public dancing, music, or other public entertainment of a like kind, in the cities of London and Westminster, or within twenty miles thereof, without a licence, shall be deemed a disorderly house or place. It is further enacted that every licensed house shall have an inscription in large capital letters that it is licensed pursuant to an Act of Parliament of the twenty-fifth of King George II., placed over the door or entrance. The two patent theatres and the theatre commonly called the King's Theatre in the Haymarket are excepted out of the Act; these theatres were the only theatres, properly so called, existing at the time of the passing of the Act.

The 46th section of the 2nd and 3rd Vict., chap. 47, which is proposed to be repealed, gives the Commissioners of Police power to enter any unlicensed theatres and to take into custody all persons found on the premises.

The Act of the 6th and 7th Vict., chap. 68, also to be repealed, repeals the Act of the 3rd of James I., chap. 21, entitled "An Act to restrain the Abuses of Players"; part of an Act of the 10th of George II., chap. 19, "for preventing the unlawful playing of interludes within the precincts of the two universities"; and another Act of the 10th of George II., chap. 28, entitled "An Act to Explain and Amend so much of an Act made in the twelfth Year of the Reign of Queen Anne, entitled 'An Act for reducing the Laws relating to Rogues, Vagabonds, Sturdy Beggars, and Vagrants, into one Act of Parliament, and for the more effectual punishing such Rogues, &c., and sending them whither they ought to be sent,' as relates to common Players of Interludes; and another Act of the 28th of Geo. III., chap. 30, entitled 'An Act to enable His Majesty's Justices of the Peace to license theatrical Representations occasionally under the Restrictions therein contained.'" This Act transfers the control of the theatres not being patent theatres within the Parliamentary boundaries of the City of London and Westminster and of the boroughs of Finsbury and Marylebone, the Tower Hamlets, Lambeth and Southwark, and also within those places where the sovereign occasionally reside, to the Lord Chamberlain, and gives him extensive powers for pre-

serving order upon the stage and among the audience. The 12th section provides that no new plays or additions to old ones shall be produced or acted for hire in any theatre in Great Britain without the approval of the Lord Chamberlain; and by the 14th section the Lord Chamberlain is empowered, whenever he shall be of opinion that it is fitting for the preservation of good manners, decorum, or of the public peace, to forbid the acting of any stage-play or part of a stage-play anywhere in Great Britain either absolutely or for any such time as he shall think fit.

It does not appear to be the intention of Mr. Dixon-Hartland to seek to repeal the 11th, 12th, and 13th sections of the Metropolitan Management and Building (Amendment) Act, 1878, 41 & 42 Vict., chap. 32, which give the Metropolitan Board of Works power in certain cases to require the proprietors of theatres and certain music-halls to remedy structural defects, and to make regulations with respect to new theatres and music-halls; nor the 45th section of the Metropolitan Board of Works (Various Powers) Act, 1882, which empowers the Board to require the means of exit from theatres, &c., to be kept open, and to regulate the conditions under which the doors may be closed, and the persons to be charged with the duty of closing and opening the same.

The second reading of Mr. Dixon-Hartland's Bill is fixed for the 29th of April next; the Bill has been blocked, and the second reading will be opposed by the Chairman of the Metropolitan Board of Works.

THE NEW WAR OFFICES
COMPETITION.

The following is the official announcement of the First Commissioner of Works as to the result of the first competition:—

"The judges appointed to adjudge in the competition of designs for the new Admiralty and War Offices have selected nine designs from those sent in for the preliminary competition, the authors of which will be invited to compete in the second and final competition. The names and addresses of the authors of the selected designs are as follow:—

Messrs. Glover & Salter, Queen Anne-chambers, Poultry, E.C.

Messrs. Henry Hall & W. H. Powell, 19, Doughty-street, Mecklenburgh-square, W.C.

Messrs. Leeming & Leeming, Northgate-chambers, Halifax.

Messrs. Maxwell & Tuke, 29, Princess-street, Manchester.

Mr. Thomas Porter, Dulwich Wood Park, Norwood, S.E.

Messrs. Spalding & Auld, 91, Queen Victoria-street, E.C.

Messrs. Malcolm Stark, jun., & James Lindsay, No. 248, West George-street, Glasgow.

Messrs. Verity & Hunt, 27, Regent-street, S.W.

Messrs. Aston Webb & E. Ingress Bell, 19, Queen Anne's-gate, Westminster, S.W.

CREMATION.

At a meeting of "The Balloon Society of Great Britain" (a society the "platform" of which certainly seems to be of a strangely varied character), on the 28th of March,—Dr. Cameron, M.P., in the chair,—Dr. Comyns Leach read a paper on the subject of cremation, partly argumentative, partly practical and descriptive. Like others who came forward as pioneers in connexion with this method of disposing of our mortal remains, Dr. Leach seems a little *lèche montée* on the subject; and we should have thought his paper more sensible and more to the point, as a whole, if there had been less of the rather sensational recounting of dangers actual or possible, but some of them certainly very little probable, from existing methods of burial. The danger of being buried prematurely, when life is not really extinct, we should imagine most medical men would agree in regarding as an imaginary one, except when gross carelessness may in a few instances (some of them, perhaps, of doubtful authenticity) have rendered that possible which should be impossible. Passing over, then, this destructive criticism in regard to existing methods, to which a disproportionate extent of the paper was devoted, we give the main substance of Dr. Leach's remarks on the proposed process and *matériel* of cremation:—

"Various furnaces have been proposed for the reduction of the body by fire. The furnace of

Professor Gorini, of Lodi, is one that requires wood or coal only for its fuel, and therefore is well adapted for country places. The crematory furnaces erected for the Cremation Society at Woking is on this model, and consists of a receiver, a furnace, and a high chimney. The furnace is placed in front of, and at a slightly lower level than, the receiver or crematory chamber, into the end of which it discharges its heat, the other end communicating with the chimney by which all the products of combustion, from the receiver as well as from the furnace, are removed. These highly-heated gaseous products have, in addition, to pass through a mass of burning coke at the bottom of the chimney, and any organic matter which may have resisted or escaped the first combustion are destroyed by the second, and mix harmlessly with the atmosphere. A second kind of furnace is the Siemens apparatus, used in Germany, and consists of an arrangement for the manufacture of gas, either from coal, peat, or wood, for the purposes of heating the furnace, a regulator, the furnace itself, and a chimney. The cremation is effected by heated air, in this way:—The gas, mixed with air in proper proportions, being lighted, passes through the piled-up firebricks of the regulator, and heating these to a white heat, it passes into the furnace or cremating chamber, whence, after raising it to a red heat, the flame escapes through the chimney. The body being then placed in the furnace, the gas supply is continued, according to circumstances, for a longer or shorter time, and then air alone is admitted into the regulator, whence, heated to red heat, it passes on to the receiver, and continues and completes the process. Dr. Wm. Siemens's regenerative furnace, as recommended by Sir Henry Thompson, affords a more rapid and complete combustion, and is thus described by him in connexion with the cremation of a body which weighed no less than 227 lb. Sir Henry says:—"The body was placed in a cylindrical vessel about 7 ft. long by 5 ft. or 6 ft. in diameter, the interior of which was already heated" (in the manner before described) "to about 2,000° Fahr. The inner surface of the cylinder is smooth, almost polished, and no solid matter but that of the body is introduced into it. The product, therefore, can be nothing more than the ashes of the body. No foreign dust can be introduced, no coal or other solid combustible being near it; nothing but heated hydrocarbons in a gaseous form and heated air. Nothing is visible in the cylinder before using it,—a pure, almost white, interior,—the lining having acquired a temperature of white heat. In this case the gases, given off from the body so abundantly at first, passed through a highly-heated chamber, among thousands of interstices made by intersecting fire-bricks, laid throughout the entire chamber, lattice fashion, in order to minutely divide and delay the current, and expose it to an immense area of heated surface. By this means they were rapidly oxidised, and not a particle of smoke issued by the chimney. The process was completed in fifty-five minutes; and the ashes, which weighed about 5 lb., were removed with ease." Other furnaces on this regenerative principle have been invented and described, but I think the above illustrations will be sufficient for my purpose. The one at Rome, already mentioned, I imagine to be somewhat after the plan of the model of the Manston Crematorium. Sir Spencer Wells describes it as follows:—"The building resembles a small cottage. There is no high chimney, and the furnace is a very simple oven of firebrick. The fuel used is wood only, and, at the cost of 6 francs, an adult body is burned in about two hours. No visible smoke, and nothing offensive, escapes from the chimney, as it is all consumed in a small coke fire at the lower part of the chimney, just as in the more perfect apparatus built for the Cremation Society of England."

The furnace in which the body of Captain Hanham, R.N.,—the first of English modern cremationists,—was resolved into thin air and harmless dust, was illustrated by a model exhibited to the meeting. It was projected and built by Mr. Thomas Richards, of the Wincanton Iron Works, a gentleman who, for many years, had devoted himself to improvements in the construction of kitchen ranges and other grates. The walls of the Crematorium are solidly constructed of brickwork, and the whole of the interior, which is subjected to the intense heat, consists of firebricks and lumps set in freelay. The fireplace and the ashpit run from end to end, and the fire-grate is of ordinary

engine-bars. The doors of both fireplace and ashpit are so constructed that there is a space between the outside iron, and the lining of firebrick, and they are hung to outside iron frames.

The folding-doors to the cremating-chamber are of firebrick panels, framed in iron and strongly hung to two massive angle iron bands, which go entirely round the building; over these doors, and bolted to the top band, is a strong iron lintel, for the support of the superincumbent structure.

The roof over the fireplace, and the bearers for the coffin, are so arranged that the flames can come freely up from the fire without any risk of the ashes of the subject cremated falling through. Inlets are provided for the admission of thin streams of air, in order to perfect the combustion of the gases evolved, and to generate intense heat.

The roof of the cremating-chamber is arched from front to back, and is provided with three dampers, of fire-brick, to regulate the heat, and over the arch is turned a second, from end to end, to support the chimney. The chamber between these arches is provided with a door for cleaning, and a ventilator for the admission of more air, if needed, for the more complete oxidation of any gases that may hitherto have escaped combustion. At the back of the cremating-chamber are constructed other flues, which, when opened by means of dampers provided for the purpose, allow the flames from the fire to pass directly to the upper chamber; so that, by closing the flues into the cremating-chamber and opening these, the subject for cremation can be introduced after the apparatus has been heated. The chimney, although low, is of large size, with an exceedingly good draught, and was so constructed, because a tall chimney would have been unsightly in the grounds where the building is erected.

The building is plain in character, but might easily be made ornamental by the use of tiles, &c., if desired. If wished, a grating for burning coke at the time of the cremation could easily be constructed at the bottom of the chimney, as is the case at the crematoria at Woking and Rome. The cremation of the bodies of the two ladies took place on successive evenings in October in 1882, and, notwithstanding a few slight imperfections in the furnace as then constructed, and which have been remedied in the model exhibited, the process was most successful, it being carried out without the slightest nuisance to the neighbourhood; for during the whole time of the cremations, although the nights were damp and oppressive, with scarcely a breath of air, there was not the faintest trace of odour perceptible.

That the original object of cremation was sanitary, and not religious, is undoubted; that it became identified with heathen worship because, at the time of its adoption, everything was heathen, is surely no argument against it; if it is, the same might have been urged at one time against the burial of the body in the earth; and if we are to reject every practice that commends itself to our judgment, on the score of its being heathen, we should, to be logical, discard our classics from our schools, our Greek models from our studios, much of our jurisprudence from our law, and more of our philosophy from our literature. That cremation is too costly a process, especially for the poor, is a more real objection; but I hope to show that even this is easily refuted. That the first erection of the necessary apparatus and buildings would be expensive is true; but do we not, even in our villages, when the overcrowded churchyard necessitates the supplementary cemetery, with its chapel, its lodge, and its ornamental enclosures,—to say nothing of the waste of land,—incur a still greater expenditure? And, in any case, there would be the same cost of transit, and the expense of the niche for the urn would but little exceed the cost of a grave, and be far less than that of a vault, or even that horror of horrors, a "bricked-up" grave. There would be a still smaller necessity for an expensively-substantial coffin, and the leaden one would be for ever abolished. The actual cost of the fuel would vary with the neighbourhood; but, judging from the quantity used at Manston, it should not, in any case, exceed seven or eight shillings."

In the course of the discussion which followed, the Chairman said they must all feel much obliged to Dr. Comyns Leach for the very in-

teresting and able paper which he had read to them. He was convinced that any one who thought seriously for himself must feel that the pain of parting with some dear friend was aggravated by the present mode of disposing of the dead. Those who objected to cremation should read the Blue Books issued on the subject of burials, which he was sure must create feelings of horror in their minds. Mr. Justice Stephen had just delivered an elaborate decision to the effect that cremation was not illegal. Sir William Harcourt, when questioned as to the course he would pursue in regard to cremation, did not attempt to explain the law on the subject, but said that it was repugnant to public opinion, and that he would interfere to prevent it if he had the power. As a matter of fact, however, he did not interfere when Capt. Hanham was cremated, neither did he in a recent case in Wales. The question of cremation had been very much before the public lately, and newspaper articles in the leading daily papers had spoken favourably of it, which was the true indication of the state of public opinion. The question was also to be regarded in the light of liberty, and it appeared to him that any attempt on the part of any of our executive departments to interfere with a practice which commended itself to many people in this country, and was not illegal, and which it was proved by experience in other countries was in no degree dangerous to public health, was not to be tolerated.

Sir T. Spencer Wells moved the following resolution:—"That in the interests of public health and national economy prudent statesmanship should endeavour to encourage the substitution of cremation for burial as the mode of disposing of our dead." He said that the profession to which he and Dr. Comyns Leach belonged were familiar with the great evils which attended the present system of burials in this country. They were constantly hearing of cases of disease which were to be attributed to impure air and impure water in the neighbourhood of burial-places in our large towns. The air became polluted and the water poisonous, and contained the germs of contagious disease. There was no doubt that the public health was endangered by the system of burials, which had become intolerable, and he felt certain that, unless there was some alteration or cremation substituted, there would be, sooner or later, such an outbreak of infectious disease as would far exceed the plagues which had been hitherto experienced.

Mrs. Hoggan, M.D., seconded the resolution, and after some observations in support of it from two or three other speakers,

A gentleman in the body of the hall proposed as an amendment, "That this meeting, in the interests of public health, will endeavour to promote the practice of cremation for the disposal of the dead."

The amendment was accepted by Sir Spencer Wells and Mrs. Hoggan, and carried unanimously.

BUCKFAST ABBEY.

As short a while ago as December last all the building that remained visible of this once-important Cistercian monastery consisted of what is locally known as the "Abbot's Tower," a four-storied building of Perpendicular character, erected, as it appears, at the south end of the "Domus Conversorum."

In the year 1806, before which time the abbey ruins were extensive, a modern dwelling-house was constructed upon part of the site from the building materials obtained by the destruction of the older work. At the same time the remaining parts were carefully levelled and covered over, so that all record of their existence appears to have been lost in the locality. One clue, however, was available, and this was a description of the ruins in the *Gentleman's Magazine* of 1796, written by Mr. Laskey, and quoted by Mr. Brooking Rowe, F.S.A., in a work on the "Cistercian Houses of Devonshire." The work of the uncovering was in the main guided by this description, and the foundations of the church were partially discovered from December 13 to 22 of last year, when, owing to the want of funds for prosecuting the work, further progress was for the time abandoned. In January, with a little more means at disposal, excavation was again carried on for a week, and this resulted in the finding of the greater portion of the church foundations, and part of the north cloister. In February, with

the opportune and judicious aid of a grant of £20., made by the Society of Antiquaries, considerable progress was made, and the greater part of the foundations of the abbey buildings have been found, and more or less uncovered. These remains include the church, a cruciform building, 217 ft. long by 63 ft. wide, measuring 94 ft. across the transepts; the sacristy, chapter house, slype, frater, refectory, kitchen, and other offices, as well as the "domus conversorum," all of which surround the cloister after the usual Cistercian plan, so well known to ecclesiologists from the writings of the late Rev. Prebendary Mackenzie, E. C. Walcott, Mr. Edmund Sharpe, and others. The cloister garth measures 60 ft. in the clear, and 1 square.

This useful and interesting work is now again discontinued until further funds are available, these being much needed, in order that the large accumulation of earth arising from the excavations may be taken off the site; so as to enable the walls already found to be completely uncovered, and those of buildings conjectured to have been the abbots' house and the infirmary to be opened out. The desirability of removing the superincumbent soil from the area of the buildings is unquestionable, and a little help from archaeologists and others interested in this good work of rescuing the remains of a noble and historic institution from complete disappearance would enable the digging to be completed during the present favourable time of the year.

Among other objects of antiquity which have turned up from time to time as the work progressed, are many highly ornamental embossed and glazed tiles, of very early character, and measuring about 9 in. square. Possibly if the church floor is cleared, others may be found in their original position.

SAVOYARD AND GRECIAN ARCHAEOLOGICAL REMAINS.

At the meeting of the Historical and Archaeological Society of Geneva recently, Dr. Gosse read a long memoir on excavations made during the past year in the Eagle and Fairy caverns in Savoy, near La Muraz. Although the results did not equal his expectations, he was able to state that the vestiges of man in these caverns went as far back as the bronze age. Near these caverns are places the names of which indicate a Roman origin,—Jovi, Jovenaday, and Joux,—and not long ago they possessed Roman remains, unhappily destroyed by the peasantry who have even lost interesting objects after obtaining them, and more particularly the fragments of a stone statue. Dr. Gosse was able to determine the site of what he believes to have been a primitive Christian church near the village of Naz, remains of which were in situ but thirty years ago. The altar of this church was broken up, and the fragments distributed in the houses of those who accomplished the destruction. One of the relics has been used for a long time as the table in front of the high altar of the church at La Muraz. It consists of a tomb of the eighth or ninth century, judging by its ornamentation, and it shows certain relations obviously between Arlésian civilisation and that of Switzerland. Several plans and drawings accompanied the memoir. Dr. Gosse also exhibited some remains collected in Valais, including bronze fibulae and amber necklaces, from which he argued the presence of Etruscan influence in the earlier part of the iron age. He then dealt with the iron age in Tene, in the Canton of Neuchâtel, and exhibited a number of Gallic relics, among others several sword remarkably preserved in their metal scabbards, as well as other instruments illustrating the civilisation of the period.

Monsieur Charles Morel presented the Society with a number of wood carvings, specimens of Grecian art; also with some sculptured decorations of tombs. These had formed part of the collection of M. de Sabourroff, formerly Russian ambassador at Berlin, who, during a long residence in Greece, made a large accumulation of antiquities, including statuettes, statues, reliefs, bronzes, and painted vases. A description of the collection is in course of publication by Asher, of Berlin, in two editions, one in German the other in French, illustrated by 150 magnificent engravings, accompanied by the text, and by criticisms from the pen of Dr. Furtwängler. Six volumes of the fifteen to be published have already been issued. M. Morel

spoke upon the exterior form of Greek funeral ornaments, the nature of their decorations, and their state of artistic development.

THE CRYSTAL PALACE ELECTRIC AND GAS EXHIBITION.

AWARDS OF THE JURY OF THE GAS SECTION.

We have been asked to publish the following official account of the awards of the Jury in the Gas Section of this Exhibition. We take the opportunity of mentioning what we have once or twice intimated in our "Correspondence" column to individual writers, that we are obliged to decline publishing announcements of awards of this kind except when thus communicated officially.

GAS BURNERS.—Recreative.—Gold Medal for the Grimsdon Regenerative Gas Burner. (Exhibited by G. Bower.) Gold Medal for F. W. Clark's Regenerative Gas Burner. (Exhibited by the Portable Gas Apparatus Co.) [Bracketed as equal]

Multiple Argand.—Silver Medal for Sir James N. Douglas's Burner. (Exhibited by the Improved Gas and Oil Burners Co., Limited.) Silver Medal, William Sugg & Co., Limited. [Bracketed as equal.]

Flat Flame with Governors.—Silver Medal, William Sugg & Co., Limited.

Flat Flame in Lanterns.—Silver Medal, William Sugg & Co., Limited.

Incandescent Burners.—Silver Medal for the Clemond Burner. (Exhibited by E. Sorvies.) Silver Medal for the Lewis Burner. (Exhibited by G. Bower.) [Awarded to these two in recognition of novelty of principle.] Silver Medal to also Carbon Light Co., Limited, for their method of increasing the illuminating power of gas.

COOKING STOVES.—Silver Medals to H. & C. Davis & Co., J. Wright & Co., General Gas Heating and Lighting Co., Limited, and Messrs. Waddell & Main, who are mentioned in order of merit. Also a Silver Medal to Stodde & Co. for their summer and winter stove. This stove is also applicable for heating purposes as a reflector stove.

CROSS HEATING STOVES.—Silver Medals awarded to Messrs. John Wright & Co., the General Gas Heating and Lighting Co., Limited, and William Sugg & Co., Limited, named in order of merit.

OPEN HEATING STOVES.—Asbestos Fuel Stoves.—Silver Medal to West Brothers.

Tile Stoves.—Silver Medal to General Gas Heating and Lighting Co., Limited.

Reflector Stoves.—Silver Medal to Stodde & Co. (see above), for summer and winter stove.

INSTANTANEOUS WATER HEATERS.—Silver Medals to W. H. Sugg & Co., Limited, for a Thermos Heater, and Stodde & Co., named in order of merit.

GAS GOVERNORS.—Silver Medal to James Stott & Co.

GENERAL AWARDS.—Diploma of Honour to George Glover & Co. for the general excellence of their Exhibits. Diploma of Honour to W. Parkinson & Co. for the general excellence of their exhibits. Silver Medal to Fitch's Patent Lighting Co., Limited, for their gas apparatus. Silver Medal to Thompson's Smokeless Kilm and Oven Co., Limited, for their kiln. Silver Medal to the Portable Gas Apparatus Co. (F. W. Clark) for their apparatus for the manufacture of gas. Silver Medal for Fletcher's apparatus for the application of gas to heating purposes. (Exhibited by Deane & Co.)

The jurors were Captain Douglas Galton; Mr. Robert Harris, Mem. Inst. C.E., Engineer of Gas Light and Coke Company; and Dr. W. F. Russell, F.R.S., Professor of Chemistry, St. Bartholomew's Hospital.

PICTURE EXHIBITIONS.

We have only space to note briefly the contents of Mr. Wallis's gallery, which opened this week for the annual spring exhibition, and in which the very best painting is a cattle picture by Van Marcke (17), which is exceedingly fine in its way. But we look for something of higher interest as the chief picture in this gallery; and Echter's "La Ruine d'une Famille" (102), though a pathetic work in feeling, is not of the highest order of execution. Heffner's landscapes seem to show that a certain degree of mannerism, which his finest works have not seen without, is increasing upon him; witness he artificially-contrived parallel lines in the foreground of No. 25 (no title). Meissonnier is represented (19), not quite at his best. The rest of the other works are by Fromentin, Heller, Jeanowitz, Spring, and others. A life-size "portrait," by F. H. Kaubach (136), has no qualities, nor carried out altogether in the character examples of his work in the upstairs room.

The Society of British Artists contains one remarkable painting, the nude study, by Mr. Hill, under the title, "The Shell" (491), a small picture of a girl lying on the sea-shore holding a shell to her ear. A more living and satisfying figure of the kind one does not often see. The exhibition, as a whole, is about up to the usual mark. Among things above the average are Mr. E. Ellis's "In Fold" (120), a powerful landscape; Mr. Cauty's "Coming

Events" (153); Mr. Henley's "Albert Dürer's Commission" (292). The catalogue is embellished with very nice illustrations, in some of which (No. 246, for instance) the design produces a much more favourable effect when shown in black and white only.

INTERNATIONAL EXHIBITIONS.

In the course of a lecture on this subject by Mr. Forbes Robertson, delivered last week at a meeting of the "Society for the Encouragement of the Fine Arts," the lecturer remarked that they are no new things, and affirmed that their prototype is still to be found in the great fairs of the East, which are wonderfully all-embracing, and quite international in their character.

In referring to the Fine Art Exhibition of Munich, he praised with considerable emphasis the figure-work of Piety and the landscapes of Heffner. In the International Exhibition of Black and White at Vienna, he found, on the whole, that the Americans were the most picturesque wood-engravers in the world, the French *facile princeps* in etching, and not to be excelled in engraving. At the same time he regarded the Madonna Sistina of Professor Mandel, and the School of Athens, by Professor Jacoby, as two of the greatest masterpieces in pure line which modern times have produced.

Among the gentlemen who took part in the discussion were Messrs. Cave Thomas; Edmonstone, president of the society; Collins Levey, C.M.G.; and the chairman, Mr. Storey. The lecture-room was decorated with a dozen engravings of the highest art quality from the Fine Art Society of Vienna, which is devoted entirely to the reproduction of famous works of art. A beautiful proof of Mandel's Madonna hung on the walls.

LIVERPOOL ENGINEERING SOCIETY.

The sixth meeting of the session was held on Wednesday evening, March 26th, at the Royal Institution, Colquhoun-street, the President, Mr. R. R. Bavis, junr., in the chair, when a paper was read by Mr. W. A. Carver, entitled "Estuaries." The author, in opening his paper, dealt with the importance of the estuary in maintaining a channel of sufficient depth for ships; the rise and fall of tide, with its velocities at the surface and at the bottom, giving various data as to the Mersey. He then alluded to the depth of the bar at Liverpool, showing how the variations were due to special causes in the Estuary, giving the quantity of solid matter held in suspension. He also described various alterations in the Dee, Tees, and Ribble.

BRISTOL JUNIOR ARCHITECTS' SOCIETY.

The opening meeting for the season of this Society was held on the 29th ult., the building chosen for a visit being the remains of the Bishop's Palace, Bristol Cathedral. In response to the request of the Society, Mr. W. E. Hill (late hon. sec., and the author of the prize essay of the Society upon the Cathedral), acted as guide on Saturday. The history of the monastery and bishopric, so far as it concerned and affected the Palace, was very ably described by Mr. Hill. After listening to a full description of the beauties of the Bishop's Palace, the visitors were conducted through the existing portions of the old passages formerly communicating with the Palace, and the interesting ruins of the palace itself were the subject of a very lucid description by the guide. After having pointed out the traces of the Norman building and the succeeding Perpendicular one, Mr. Hill drew the attention of the Society to the groined chamber, which he considered to have been a dungeon or place of confinement, his opinion being based upon very explicit foundations. This apartment was, no doubt, one of the earliest portions of the monastic buildings, being Early Norman in character, similar to the Abbot's Gateway, containing two columns of slight dimensions, having cushion capitals, the base of the columns being hidden by the ground having been made up for some later necessities. The windows opening in this chamber were Perpendicular in character, and very probably inserted by Abbot Newland. The remains of the entrance to the Palace and also to the chapel were described in detail. In concluding a very able and interesting paper, Mr. Hill hoped that the visit of their Society would tend to attract more attention to the ruins which they at present enjoyed; very few of the public were aware of the very interesting remains still existing. This was, perhaps, due to the little encouragement given by the authorities of the cathedral to visitors.

RESTORATION AND ANTI-RESTORATION.

We have been asked to publish the following correspondence:—

The Society for the Protection of Ancient Buildings,
No. 9, Beckingham-street, Adelphi, W.C.,
February 12, 1884.

To Henry Hicks Gibbs, esq., Aldenham House,
Watford.

SIR,—The Committee of the Society for the Protection of Ancient Buildings having seen the announcement of your munificent proposal to restore or complete the high screen at the back of the altar in St. Alban's Cathedral, beg leave to present the following points for your consideration.

Though the screen has suffered, like all such parts of our ancient churches, chiefly by the destruction of the images, there is still so much remaining that it is strictly a Medieval work.

When we think of so many churches which had only a few years back equally good remains of Medieval art, which have since been, for all artistic and antiquarian uses, utterly lost, in the mistaken attempt to recover for them what was, in fact, irrecoverable, we cannot but think St. Alban's Church is highly fortunate in possessing this beautiful original screen, and we cannot let the announcement of its intended restoration go by without offering you our experience of what is called restoration. We beg you will credit us in doing this with the same motives which led you to undertake the work.

Restoration is commonly a two-fold destruction. There is, first, the positive material alteration of ancient surface which is caused by cleaning, retouching, and the general smartening up is always one of the objects of restorers; and there is the not less effectual destruction of Medieval aspect which is caused by the substitution for lost features modern productions, supposed to be Medieval.

That "restoration" does, in fact, destroy, and not restore, is now well understood; but, unfortunately, the truth is only admitted with regard to works that are done, and is seldom allowed to prevent the beginning of new works of the same kind.

We suppose that the contemplated restoration of the screen will be partly a cutting-out of broken members, and the substitution of new worked stone to make the design continuous, and partly, but mainly, the filling of the vacant niches with new sculpture in the style of the fifteenth century. As this last is by far the most important part of such a scheme, we will address ourselves chiefly to it, in the hope that you may be induced to reconsider your offer from this point of view,—that the hopelessness of any restoration worthy of the name may be for the whole established.

The imitation of lost styles of art is practised in the belief that art is a mechanical trade, having certain rules and fashions which, once learned, will enable the practitioner to turn out works in this style or that according to order.

There is another theory of art that makes it an unrestrainable expression of the active imagination and of the sympathy with natural beauty which are developed more or less, at various times, by the social condition of a people. If this last view has any truth,—and we do not see how ancient art can be accounted for by any theory very different to that,—the art of one time cannot be simulated by that of another. If art be not genuine, no attempt to replace it by scientific cunning will produce anything but a sham; and nobody can suppose that the tribe of modern Medieval carvers is animated by the feelings, the social influence, and the unbroken tradition which surrounded and impelled the carvers of the fifteenth century.

Medieval carvers, moreover, were by all consent very skilful, and we know that their best men were occupied on church work, and on details now thought beneath the dignity of a sculptor. We do not think any one believes that modern sculpture is a flourishing art. No one takes any real interest in it, and it quite deserves the neglect it receives. Still, such as it is, is best paid professors do not condescend to carve images for a screen, and only those who cannot obtain recognition as sculptors apply themselves to the trade of "Medieval carving." It is, then, to the skill of the lower members of a group of unimaginative and mechanical artists that you will have to look for the reproduction of a series of figures which no longer exist, but which, when perfect, must have represented the best work of a still great and original school of architectural sculpture,—a school capable by its meanest members of doing infinitely better than any work it has been our lot to see of modern times. It would be a great misfortune, always to be regretted, if another fine work of the Middle Ages were marred by the introduction of modern additions quite out of harmony with it in all essentials of good sculpture.

That it will be so marred if the process called "restoration" be practised upon it is made sure by all the experience we have had of similar restorations elsewhere.

We beg most earnestly you will give full weight to every consideration which leads you to hesitate before finally resolving on a work which, when done, cannot be recalled.

We would not, however, wish to deprive St. Alban's Church of the goodwill you have so largely shown by your offer, and we will ask leave to point

out that a church so large as that stands in need of constant supervision and repair. Money will always be needed, and it is possible, when the present enthusiasm for restoration is passed, it may be difficult to provide the funds for those necessary attentions which a building cannot, in fact, do without. A fund large enough to provide for the regular payment of one or two masons and a plumber ought to be attached to the building, to ensure the immediate repair of any defect, and to keep the building always sound and in weatheright.

I remain, sir, yours faithfully,
THACKERAY TURNER, Secretary.

Aldenharn House, near Elstree, Herts.
March 5th, 1884.

SIR,—I have received your letter of the 12th ult., and find much in it with which I can agree, but much also which appears to me to be written without a perfect knowledge of the case in question.

"Restoration," so called, has no doubt been frequently synonymous, or nearly synonymous, with "Destruction." The "smartening up" of which you speak is detestable; and all alteration of ancient surface is greatly to be deprecated. So far I agree with you.

But I think your Society should take into account that it is quite possible for others to feel quite as strongly on these points as its members do, and to have at least as great a reverence for antiquity and true art as they have, and yet to desire to repair the ravages of ignorance and superstitious folly, and to replace what mischievous hands have destroyed.

You suggest the provision of a fund for the repair of the Abbey of St. Alban. I am glad to say that such a fund is already (prospectively) provided. But what is your repair? I fail to see where the line is to be drawn.

If a wall may be repaired, why may not the windows that are in it? If the windows, why not their mouldings? If the mouldings, why not the enrichments of the mouldings, such as those in our Lady-chapel? And if these, why not also a pinnacle or a canopy which may have been artfully sawn or broken off, and for which we have the exact models before us?

That is what I am doing at St. Alban's. Nothing that is old will be made to look new; nothing that is new will be "supposed to be Medieval." The old portion of the screen will show its age, and the new will show its newness; and though I have no fear but that it will be as good as that which it replaces, I do not expect that any but the ignorant or heedless will imagine that both portions are of the same age.

The remainder of your letter is directed to dissuade me from filling the niches with "new sculpture in the style of the fifteenth century." . . . in imitation of lost styles of art.

Your Society seems to me to be in error, first in assuming that in such works there is universally an intention of imitating or copying something; and, secondly, in assuming that this present age neither has produced nor can produce any one who possesses those qualities which, as you rightly imply, are necessary to the conception and execution of such sculpture, viz., "active imagination and sympathy with natural beauty," and (you might have added) with the religious aspect of the work.

The screen I do propose to restore, for my intention is that the existing models should be precisely followed by carvers as able as those who carved those still-existing parts which serve as models; but I have no thought of "restoring" the screen. It is impossible to do so, for I do not know what they were. Those I shall place there must not, indeed, be incongruous with the fifteenth-century work in which they will stand; but I see no reason to apprehend that they will be copied or imitated from any other work, still less that they will be as you without any warrant assume, "out of harmony with the screen in all the essentials of good sculpture."

I have appointed a man to the work who, as I believe, is informed by the same spirit as that which actuated his predecessors in the art. He, to use your own words, "occupies himself in details thought by many sculptors to be below their dignity," and in no way deserves to be ranked as you, no doubt in ignorance, rank him, with "the unimaginative mechanical artists" to whom you refer.

The figures which he will place in the niches may be better,—or worse,—than those which formerly occupied them,—we have no means of comparison; but they will be certainly original, and, I have no doubt, worthy of their place. They will serve to correct the "experience" of which you speak, and which, however justly it may have judged as to some of the works which have come under your observation, would have been, so I venture to think, corrected already if your Society had brought less prejudice and more accuracy of observation to its aid.

I take for granted that you wish the views of your Society to be publicly known, and, as I have no objection to allowing a like publicity to mine, I propose to send this correspondence to the papers.

I am, yours faithfully,
HENRY H. GIBBS.

To the Secretary of the Society for the Protection of Ancient Buildings.

The Society for the Protection of Ancient Buildings,
No. 9, Buckingham-street, Adelphi, W.C.
Re the High Screen, St. Alban's Abbey.

To Henry H. Gibbs, esq.

SIR,—The restoration of the screen at St. Alban's is of so much public interest that we heartily concur in your proposal to publish what we have written, but as your reply puts to us several questions which ought not to remain unanswered, we will beg you to print this letter at the same time.

You ask what is the repair we sanction, and where the line may be drawn between the repair of a cracked wall or a weak foundation, and the removal of every broken crocket or displaced statue.

Certainly, in the way you put the question, there is nothing to stop the triumphal march of the restorer, once admitted to a building for the repair of a buttress or a roof, until he has scraped the last stone, re-carved the last inch of moulding, and corrected everything that to his mind is either inconsistent or imperfect.

The Society for Protecting Ancient Buildings is not so foolish as to admit of a principle which leads to this. The repair it asks for is, firstly, of the preservative kind, which prolongs the life of a building by stopping the inlet of decay; not by constantly renewing this part and that, but by keeping all parts in sound and healthy condition. When serious defects have to be dealt with, then it considers how they may be remedied with least loss of ancient work.

It has no pleasure in patching and renewing, and when such severe remedies are necessary, it would always do the least possible, and that in the most direct and unpretending fashion, even if in so preserving the old it might offend modern notions of perfection and beauty.

Between the Society and the restorers there is, then, this wide distinction,—that we would never substitute a new stone for an old, unless the safety of a building required it, and every such change would be made with the deepest regret.

This difference of temper between us, instead of leading to all that you think is implied in the word "repair," would be a constant check to the rash and ignorant zeal which pulls down first, and then considers what is to be done. Moreover, it allows of no repair which is not structural and essential to the preservation of the building.

The replacing of ornaments which "mischievous hands have destroyed" cannot be justified by reasons which make repair of the fabric a duty.

Such replacements (if, indeed, it were wise or possible to make them) would be prompted by reasons which, without any offence, we should call sentimental. On this ground there is room for wide diversity, and on one side we cannot but think great weight is due to the feeling that the history of a building like St. Alban's is sacred, even though in some respects it may be painful.

The spectacle of what "ignorance and superstitious folly" have done, and may do, is not without significance even in a church, and the lesson it teaches has always to be learned. This, however, we must not do more than hint at; we may say more boldly of the restoration of the defaced tabernacle work, that our previous remark is not touched by your reply. The restoration of that must be the destruction of the remains that now exist, and when they are gone there will be no evidence to the next generation that your restoration is really a copy of the ancient design, and is not,—like that of All Souls' College, Oxford, for instance,—a modern rearrangement.

Of your ability to restore either the tabernacle work or the statues, we have still the opinion which has been formed by many years' intimate acquaintance of the best that has been done in both kinds. You may, perhaps, have found an unknown carver "informed with the same spirit as his predecessors" of the fifteenth century,—endowed, that is, with the fruitfulness and knowledge a wise association for mutual help gave them in the application of natural principles to the development of a consistent and beautiful architecture; he may be heir to this spirit, and amidst all the distracting influences of an unsympathetic time of isolated work and competitive prices, may have cultivated the precious seed of Medieval art, to burst once more into bloom over this ancient screen; but we think all the conditions for such development are wanting in the nineteenth century. We do not see it in the same men which degrade the work of the sixteenth century, nor in the sculpture now going on at Westminster. We deny the possibility of it so long as workmen are not artists, and masters little better than tradesmen.

Permit us to add that we deeply regret the determination your letter conveys.

I remain, sir, yours faithfully,
THACKERAY TURNER, Secretary.

St. Dunstan's, Regent's Park.

March 13th, 1884.

SIR,—I have received your letter, without date, but which I suppose was written yesterday.

I have only to observe that my plea for true restoration does not, as you suppose, justify "scraping the last stone or recarving the last inch of moulding." Recarving and scraping are not only objectionable, but are nowadays justified by nobody;

but when new stones have to be used, it is surely permissible to carve them.

You have misapprehended one part of my letter, probably from imperfect acquaintance with the screen itself. The restoration of the tabernacle work does not involve "the destruction of the remains that now exist." None which now exist will be destroyed or removed, but they will serve as working models for the corresponding parts which have been destroyed.

One word on behalf of the workmen, on whom you rashly pronounce so universal a condemnation. I have known working carvers who are true artists, and very many who are as competent as those of their class in any other age, to execute such works as those under discussion.

Your Society believes that there do not exist architects capable of directing or workmen capable of executing such works. I must take leave to think that the opinion of the great majority of educated men is against you.

Yours faithfully,
HENRY H. GIBBS.
To the Secretary of the Society for the Protection of Ancient Buildings.

GIBBS & FLEW (LIMITED).

The profitable character of building operations, when conducted on sound principles, is illustrated in the experience of this company. Established as a private business in the year 1876, it was converted in 1882 into a public company with a capital of 100,000l., and last year the capital was increased by private subscription to 250,000l. The report and accounts for the year 1883 were submitted and adopted at a meeting held on the 27th ultimo. They showed a net profit of 47,865l. 7s. 6d., and a dividend was declared at the rate of 12 per cent. per annum, which, with the interim dividend at the same rate paid in July last, will absorb a sum of 18,176l., leaving a balance of 29,689l. A sum of 25,000l. has been placed to the reserve fund, and the remaining 4,189l. carried forward.

The following extract from the report may be interesting to our readers as showing that under proper management the realisation of profits from building speculation is compatible with good work, even in the smaller class of tenements which are too often the special field of operations of the jerry-builder:—

"Shortly after the constitution of the present Board there seemed indications of over-building not only in the neighbourhood of the company's estates, but throughout the metropolitan area, and the directors considered it prudent to curtail their building operations; but as the demand for the company's houses has of late been largely in excess of the rate of production, the directors have, since the beginning of the present year, increased their operations to meet the demand, and there have been indications of considerable improvement not only in the increased rentals of the company's houses, but also in sales.

The directors have felt the desirability of building the company's houses in the most approved manner, and in the most solid workmanship and high finish, a policy which, notwithstanding so large an amount of immediate profit, must obviously result in ultimate advantage to the shareholders.

The sales of houses, ground-rents, and land during the year amounted to 69,477l.; 214 of the company's houses were let through their offices, at an aggregate rental of 10,741l. 18s., in addition to which there were let, also through the company's offices, on commission, 245 houses upon the various estates belonging to the company.

Notwithstanding the general complaints of the difficulty of letting houses, the demand for those of the company's estates is steadily increasing, and applications are being continually received from a most desirable class of tenants. During the year 1882 the number of lettings was 366, and in 1883 the number was 459, and during the ten weeks from the 1st of January to the 10th of March of the present year, there have been let 131 houses, a number which, it is believed, is unprecedented in the history of any building firm in England. If the lettings at this rate during the present year, which there is every prospect, the rental of the company will be increased upwards of 20,000l."

The explanation of the large profits realised from building operations carried on in the spirit indicated in the foregoing extract is in part furnished by the following statement taken from the prospectus circulated with the last issue of shares:—

"1st. Messrs. Gibbs & Flew have purchased the own freehold estates, and possessing all the appliances and organisation for developing the properties have not only made the builder's profits upon the houses, but also the profits on the land and ground-rents, which are generally the great source of profit and usually realised by the Freeholder.

2nd. The estates have been judiciously selected, all being in the Western and South-Western Dis-

ricks, which are gradually increasing in value, by the natural growth of London in that direction.

3rd. The whole of the estates are on gravel soil, and are well drained.

4th. The houses erected have been of moderate rentals (ranging from 30*l.* to 100*l.* per annum), well built, and adapted to the requirements of the neighbourhood, in consequence of which there has been a continuously-increasing demand for them.

5th. Messrs. Gibbs & Flew owned their own brickfields, extensive steam saw-mills, joinery, stone, and marble works."

It is by such concentration of work and of material resources that it is possible to make profits on a system which shall be equally just and satisfactory to the shareholders and the public.

ORIENTAL SCULPTURE

SIR,—May I be permitted, on my own behalf and on the behalf, I am sure, of many other readers of the *Builder*, to thank you for the full and excellent reports of the series of lectures at the Royal Academy on the above subject? It is, indeed, a great thing to at last find the subject,—so lavishly illustrated by our national collections, but hitherto only known and studied by a small body of specialists,—receiving such full and able treatment at the hands of the recent lecturers before the Royal Academy. There are one or two points in Mr. Poynter's admirable lecture on which you will, perhaps, kindly allow me to add a few words, not by way of criticism, but in order to elucidate matters which only a knowledge of the cuneiform inscriptions make clear.

It is with great pleasure that I find Mr. Poynter endorsing the ideas which have been already expressed in your columns as to the marked difference between the art of ancient Chaldea and that of Assyria in the treatment of the human form, and his apt simile drawn from the contrast between Nubians and Arabs is one which will be of great value. The few statues which we have, both from Assyria and Chaldea, such as the figures of Nebu from Nimroud, the statue of Assurnazirpal, only but one degree removed from a bas-relief, a figure of Istar from Nimroud (unexhibited), and the early examples from South Chaldea, are all hideously void of all elements of beauty, nobility of form, or anatomical correctness. The reason for this, or, at least, one reason, is very clearly brought out by the study of certain inscriptions in the British Museum relating to the dedication of statues of the gods.

In the inscription of King Agtikakrini, who reigned in the fourteenth century B.C., the king states that he brought back the statues of Mero-dach and Ziratpanit which had been carried away, and that he dedicated to them, for festal attire, "blue robes, striped robes, variegated robes, and horned crowns of gold." So also in the tablet relating to the dedication of a statue of the Sun-god in the temple at Sippara by Nabubaididdin, about B.C. 1000, do we find mention of a complete set of festal robes for the statues of the Sun-god and his consort. That it was the custom to clothe the statues of the gods and goddesses at a very remote period is proved by the rubric attached to the celebrated tablet describing the descent of the goddess "Istar into Hades," where the robing of the statues of Istar and Tammuz Adonis are fully described.

This custom had its origin, no doubt, in the decoration with coloured cloths, garlands, &c., of the earliest statues of the Asiatic mother goddess. These were conical stones like the statues of the Phœnicians and Pre-Islamic Arabs, the Asherah and sacred fir-trunks of the Phœnicians and Phrygians, and these rude unartistic figures of prehistoric time exercised no doubt a restrictive power on the art of future time.

In his Primer to Homer, Mr. Gladstone has pointed out that the only statue of a goddess mentioned must have been a seated one, as the veil offered was placed on the knees.

The seated figures of divinites were distinctly of Chaldean primitive origin, and as such were derived from the kingly office of the gods,—the ancient pictorial ideograph of a king representing "Man seated on a Throne." This seated form of statue passed from Chaldea to Assyria, appearing in the statue of Assurnazirpal of the Middle Empire, but not later. It was, however, adopted by the Asia Minor and Syrian races who came in contact with the early civilisations of Chaldea. Thus we find it adopted in a bas-relief of the

Asiatic goddess or a queen at Eyuk in Phrygia,* and on cylinder seals which have been found in North Syria, and which were, no doubt, of Hittite origin.

Though this form does not appear to have been adopted in Assyria after the time of the Middle Empire, it was retained in Babylonia, as is shown by some statues found at Borsippa and Aboo Hubba by Mr. Rassam, which date from the time of Nebuchadnezzar, and which are probably contemporary with the figures from the sacred way at Branchida.

In one great branch of art, namely, that of symbolism, the artists of Chaldea exercised great influence on the Greeks and their Phœnician instructors. On memorial stones from Aboo Hubba, now exhibited in the British Museum, we meet with the winged Pegasus, the scorpion Sagittarius, the serpent-limbed figures, like those in the Gigantomachia from Pergamos, the two-headed Cerberus, and Gryphons of many forms, while Heabani, the Satyr companion of Gisdhubar, became the type of Pan and his fellows.

There are some other points on which I would like to trespass upon your space, but I will not now deal with them. I would, however, mention that the handbook for the Nimroud gallery of the British Museum is in preparation, and others will follow, thus meeting the wishes of your correspondent of a few weeks ago. I intend after Easter to commence a series of lectures on Assyrian and Babylonian antiquities in the galleries of the British Museum, to be illustrated by the monuments there exhibited, and I shall be glad to hear from any who may wish to join these classes.

W. ST. C. BOSCAWEN.

* * * Letters on this subject may be addressed to Mr. Boscawen, to Box 99, Office of the *Builder*.

"A WOULD-BE ACADEMY STUDENT'S DIFFICULTIES."

SIR,—Will you permit me space to thank Mr. Spiers for his valuable answer to my inquiry; to apologise to him if my view of his reception be a mistaken one; and to respectfully assure him that his surmise concerning the Travellers' Club House is incorrect?

IMPROBATUS.

OLD MORTAR.

SIR,—Would some correspondent of practical experience oblige by saying whether new mortar would be improved, or otherwise, by mixing old mortar ground up with fresh, in the proportion of 1 of old mortar to 3 of fresh lime and sand.

DUBIOUS.

COMPETITIONS.

Home for Incurables, Carlisle.—The design of Mr. Geo. Dale Oliver, of Carlisle and Workington, has been selected in a recent competition for the New Home for Incurables about to be erected in Carlisle.

Leicester Corporation Estate.—At a meeting of the Leicester Town Council on the 25th ult., the Estate Committee reported that, as authorised by the Council, they had advertised for competitive designs for the utilisation of building site on the south side of the new entrance to the Market-place, and 32 designs had been sent in. The selection of the designs had been in the first instance, as required by the instructions to architects competing, entrusted to a sub-committee specially appointed for the purpose, and who had reported to the Estate Committee thereon, after very full consideration of the designs with the borough surveyor (Mr. Gordon). The committee, having considered the report of the sub-committee, made selection of two sets of designs, namely, Nos. 23 and 26, which they now submitted to the Council for final decision.—Ald. Stretton moved the adoption of the report. He was sure the Council would agree with him that they were deeply indebted to the 32 gentlemen who had sent competitive designs for the building which they proposed to erect on the triangular piece of land in Horsefair-street. Each of the plans had received the very careful consideration of the sub-committee to which they were entrusted, and the plans were voted upon separately; and the result was arrived at without bias or favour. He had not the slightest idea of the name of any competitor.—Alderman Winterton having seconded the motion, Coun-

* Perrot et Guillaume, "Voyage en Galatie," &c., pl. 66.

cillor Millican (an architect) said he should like to ask by whose instructions the designs were marked "first" and "second," because he thought that the Estate Committee had only to make selection to submit to the Council.—Alderman Stretton said it was for the Council to make the final selection. Nos. 1 and 2 were put upon the plans by the order of the sub-committee specially appointed to report upon those designs. It now rested with the Council whether they would accept the report of the sub-committee.—Councillor Millican begged to move an amendment. He did not think it fair that the committee should have placed "first" and "second" upon the plans. He held a decided opinion himself as to the excellence of No. 26 over No. 23. The economy of the land was a most important consideration, and he maintained that the elevation of No. 26 was of far more sterling merit than that of No. 23, and he begged to move that No. 26 be awarded first place, and No. 23 second place.—Councillor Oliver seconded.—The amendment was rejected by 43 votes against 6 for it. The envelopes containing the names of the two successful competitors were then opened, and it was found that the first premium (25*l.*) had been gained by Mr. Thomas E. Lydiatt James, High-street, Clapham, London; and the second premium (15*l.*) by Mr. W. Ordish, Bank-buildings, Leicester.

ARCHÆOLOGICAL NOTES.

THE Bristol and Gloucestershire Archæological Society having decided to visit Evesham during the coming summer, a preliminary meeting was held in the town-hall, Evesham, on the 24th ult., to form a local committee to arrange for their reception. Messrs. Herbert New and R. Fisher Toomes were appointed local secretaries, and a committee was elected.

Messrs. J. W. Trew & Sons, of Broad-street, Bristol, write to a Bristol paper to say that in taking down an old wall at 1, Stephen-street, in that city, some pieces of the mullion of a church window were found built into the wall. It is supposed they were removed from an old church formerly standing at the bottom of Small-street.

While excavating the other day for the foundations of an addition to the premises of Messrs. Baker & Sons, Redcliff-backs, the workmen of Messrs. Brock & Bruce, contractors, at about 25 ft. below the surface came upon some stonework, which bore the appearance (says the *Bristol Times*) of being the walls of an ancient dock. The enclosed space would about contain an 80-ton barge, and the masonry was of Brandon-hill stone, and put together without any mortar. What, perhaps, was of more interest still, in the earth at the bottom the workmen came upon an old coin, considerably encrusted with verdigris, and which for some time puzzled local antiquaries. The inscription has been deciphered by Colonel Bramble, who finds the coin to be one of the Roman Emperor Valerian, who reigned from A.D. 253 to 263. On the obverse is a radiated bearded head, looking to the right; and the inscription is "VALERIANVS .P.F. .AVG." On the reverse is a figure with short cloak over left shoulder, and a rayed or spiked crown, the right hand with long fingers extended, and the left hand holding a carved club, with narrow line behind; what can be deciphered of the inscription being "ORIVS AVG. C." The coin is of silver, strongly alloyed with copper, and it is said to be quite unique in this part of the country.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

HUNT v. MONK.

THIS was a case under the Employers' Liability Act, and was tried in the Queen's Bench Division of the High Court of Justice on the 29th ult., before the Lord Chief Justice and Mr. Justice Watkins. It arose at Liverpool, the defendant being a contractor there employed to take down some buildings, which he was doing in the usual way, the plaintiff being in his employment and engaged on the work. He was filling his barrow with the rubbish he was removing, when a part of the wall being pulled down by other men engaged in the work fell upon him and injured him. He sued in the County Court, and there was no evidence that the process being used was wrong, or that any part of the plant, &c., was in an unfit state; but the plaintiff gave it as his opinion that a "derick" ought to have been used, though he admitted that he had never known it used in such work. It was objected that

there was no evidence of any negligence to make the defendant liable, but the judge overruled the objection, and the plaintiff had a verdict for 57*l*. The Court were clear that there was no evidence of any negligence to make the defendant liable, and so set aside the verdict.

MEETINGS.

SATURDAY, APRIL 5.

Building Exhibition, Agricultural Hall. (Last Day) 10 to 10.
Architectural Association.—Visit to the Hampstead Congregational Church (Mr. A. Waterhouse, A.R.A., architect). 3 p.m.
Association of Public Sanitary Inspectors.—Mr. Rees on "The Public Health Act, 1875, from a Rural Inspector's Point of View." 6 p.m.
Royal Institution.—Captain Abney, R.E., F.R.S., on "Photographic Action considered as the Work of Radiation." (VII.) 3 p.m.

MONDAY, APRIL 7.

Society of Engineers.—Captain W. B. Barker, on "An International System of Marine Course Signalling." 7.30 p.m.
Victoria Institute.—Mr. J. Hassell on "Evolution by Natural Selection." 8 p.m.

TUESDAY, APRIL 8.

Institution of Civil Engineers.—Discussion on Mr. V. Foster's paper on "The Composition and Destructive Distillation of Coal." 8 p.m.

Miscellanea.

Gray's Inn Library.—Owing to the present library accommodation at Gray's Inn being quite inadequate to receive the annual increment of books, the Benchers have decided to use a piece of land adjoining their present buildings, and fronting the Gray's Inn-road, by erecting thereon a new library with other offices, thus providing an additional space designed to contain some 11,000 volumes. The initial step in connexion with this enterprise was taken on the 29th ult., when the treasurer of the Inn, Mr. Arthur Collins, Q.C., laid the first stone of the new building, and it is intended that the work shall be completed by the end of the long vacation. In the new building there will be an entrance-hall, vestibule, and staircase approached from South-square, and forming a connecting block joining the present steward's offices and the existing libraries with the new portion fronting the Gray's Inn-road. The larger block contains, on the ground-floor, a suite of rooms to be let as chambers, and in the basement a series of strong rooms. The two principal façades, north and east, are to be constructed in red brick, with Portland stone bands, cornices, and strings. Five tall windows looking into the Gray's Inn-road will light the library, with a large projecting window at the north end. The portion of the new building fronting South-square will be constructed with Portland stone to harmonise with the present library, to which it may be regarded in the light of an addition. The works will be carried out by Messrs. Patman & Potheringham, at a cost of over 7,000*l*. from the designs of Messrs. Isaacs & Florence, of Verulam-buildings, Gray's Inn.—Mr. L. H. Isaacs being the surveyor to the Society of Gray's Inn.

The New Constitutional Club Buildings. Workmen are at present engaged in excavating the foundations of buildings for the Constitutional Club, which are about to be erected in Northumberland-avenue, immediately adjoining the Grand Hotel. It will be the largest building of its kind in the metropolis, the main frontage being upwards of 200 ft. in length, and the extreme depth of the building to Northumberland-street more than 120 ft. It will have a bold and handsome elevation to the Avenue, and will be faced with Portland stone, which is one of the requirements of the Board of Works in respect of all the buildings erected in this thoroughfare. It will be carried to a height of about 80 ft., and contain, it is stated, seven floors, and about 700 reception and other rooms, in addition to a grand hall for public meetings of the members of the club and the Conservative party generally. Messrs. Lucas Bros. are the contractors for the preliminary work now in progress, and Mr. E. W. Edis, of Fitzroy-square, is the architect.—*Morning Post.*

A Grand Pier for Weston-super-Mare.—The Weston-super-Mare Grand Pier Bill has passed the Committee in the House of Lords. This Bill is promoted by a company which has been formed for the purpose of erecting a grand pier at Weston-super-Mare, so as to enable steamers to call there at any state of the tide. It will be 2,200 yards long, and, when completed, will be the longest pier in England.

"The Usual Thing" (?) in Speculative Building.—The *Liverpool Post* of Monday last reports the proceedings in connexion with the public examination in bankruptcy of Edwin Thomas Rawson, builder, New Brighton, which took place on Saturday, at the Birkenhead County Court, before Mr. Registrar Williams. The statement of affairs issued by the bankrupt shows the total liabilities to be 36,652*l*. 10*s*. 2*d*, of which, however, 31,360*l*. 3*s*. 2*d*. is returned as owing to fully-secured creditors. The bankrupt attributes his failure to the non-letting of property. In reply to questions put by the official receiver, the bankrupt stated that he commenced business as a builder at New Brighton in 1877, and had since been carrying on business there. His capital when he commenced was 1,400*l*.—700*l*. in cash, and 700*l*. in three houses which he was building. During the seven years he had been in business his building transactions had amounted to over 61,000*l*. 38,510*l*. 3*s*. 2*d*. of which consisted of property now in the hands of secured creditors. He considered 1,400*l*. a fair amount of capital for the magnitude of the transactions, and that any man who possessed that sum might safely plunge into transactions amounting to 61,000*l*. The following are some of the subsequent questions put by the official receiver and the bankrupt's answers thereto:—Is it safe to do so? It is not exactly safe, because neighbourhoods may change. Do you consider it prudent that a man with 1,400*l*. should carry on transactions to the extent of 61,000*l*? It is speculating in building. Is that the usual amount of capital in such speculations? The usual thing is to have no capital at all. Then you are a little above the average; would you trust a man with any credit whom you knew to have only 1,400*l*. and whom you knew to be involved to the extent of 61,000*l*. in buildings? Yes; I think that would be a fair margin of capital.

The Parkes Museum.—At the last meeting of the managing committee of the National Smoke Abatement Institution, Sir Frederick Pollock, bart., presiding, it was resolved to conclude an arrangement with the Parkes Museum for space to be provided in the Museum for a collection of heating, cooking, and smoke abating apparatus of various kinds, and intended for either domestic or industrial purposes. Ventilating apparatus combined with heating apparatus or otherwise, as well as fuel and gas burners, will be included in the collection. The heating apparatus will be selected with the special view of showing typical kinds of apparatus and illustrating systems of economising fuel and abating smoke. No charge will be made to the persons whose articles are exhibited. The public are admitted to this Museum free during a portion of every day. The library of the Museum, to which the public are admitted by a member's order, contains the illustrated and descriptive report of the tests of grates, stoves, and furnaces, made by the Smoke Abatement Committee, as well as a large and valuable collection of medical and sanitary reports, and other works of reference. Persons having specimens of apparatus, diagrams, model, statistical matter, or other articles suited to the collection, or new inventions which they desire to bring to the notice of the council, are requested to communicate with Mr. E. White Wallis, secretary to the National Smoke Abatement Institution, at the offices of the Institution, which are now to be removed to the Parkes Museum, 74*a*, Margaret-street, Regent-street, W.

The Smoke Nuisance Acts.—A return of fines inflicted in the metropolis, under the Smoke Nuisance Acts, from 1877 to 1881, has been issued, together with a letter addressed to the Home Secretary from the Council of the National Smoke Abatement Institution, complaining that the powers of the Acts are not enforced. The figures show that 607 prosecutions were commenced for improper construction, and 600 convictions followed; and there were 451 prosecutions for the negligent use of chimneys, and 436 convictions. Of these, in 776 cases, fines below the legal minimum of 40*s*. were inflicted; in 167 cases a fine of 40*s*. was inflicted; and in 193 cases fines above 40*s*. were imposed.—*Morning Advertiser.*

Strike of Stonemasons at Preston.—Fifty stonemasons in the employ of Messrs. Cooper & Sallis at the building of the Free Library and Museum are on strike against a reduction of their wages from 8*s*d. to 8*s*. per hour. The contractors have advertised for men on their terms, and the men on strike have warned their fellows not to come to Preston.

The Sunday Society.—The ninth annual meeting of the members of the Sunday Society was held at 9, Conduit-street, on Monday night, Professor W. H. Corfield, M.D., in the chair. The annual report, which was read by Mr. Mark H. Judge, honorary secretary, set forth the work of the society during the past year. It returned at considerable length to the action taken in the House of Lords, and pointed out that the policy embodied in the resolution proposed this year by Lord Thurlow at the request of the National Sunday League differed from that advocated by Lord Dunraven and other representatives of the Sunday Society in both Houses of Parliament, inasmuch as "the Sunday Society had never seen its way either to ask for the opening of these institutions for a special class only, instead of for the whole community, or to seek to supersede the authority of the Trustees of the British Museum and those responsible for the management of other national museums and galleries under the jurisdiction of the President in Council, so far as the opening or closing of them on Sundays is concerned." Statistics of the Society's Sunday Art Exhibition were given. The report was adopted, and, on the proposal of Mr. Mark H. Judge, seconded by Mr. Charles H. Stanton, the Duke of Westminster was elected President of the Society.

Bridge Construction.—The seventh of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, jun., vice-principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of March 27th, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. A. T. Walsley, member of the council, in the chair. The lecturer, in introducing his subject, pointed out into how many different parts it was capable of subdivision. He then spoke of the various materials in use for bridge construction, and went on to consider more particularly brick and stone masonry, and, in connexion therewith, the nature of piers, abutments, and wing-walls, with their foundations; arrangements for roadway, centreing, &c. After this he spoke of the employment in arch form of cast and wrought iron work, and then proceeded to the consideration of girder bridge work of different kinds, showing the arrangement of plate, Warren, lattice, and other types of construction. Proceeding to the details of girder-work, with cross girders, road bearers, suspension links, compression and tension bars, roller-plates and other accessories, the lecturer pointed out the improvements effected in modern work, both as regards design and manufacture.

The Achilles Statue.—In the House of Commons on Monday evening, Mr. J. W. Lowther asked the First Commissioner of Works whether he had taken any, and what, steps, since March 29, 1883, to arrest the decay, by corrosion, of the Achilles statue in Hyde-park, and, if not, whether he would explain the cause of the decay?—Mr. Shaw-Lefevre, in reply, said: I have had the Achilles statue carefully examined, and find that its defective state is due to the imperfect amalgamation of the metals in the original casting, which has led to serious corrosion. Before dealing with the matter, which may involve a very expensive process of repair, it is thought better to wait and see how far the flaws in the metal extend. At present there is no immediate danger to the statue.

International Health Exhibition.—A somewhat novel feature in connexion with the Exhibition this year will be the establishment of a library and reading-room, a home for which the Executive Council have assigned in a large double room in the Albert Hall, overlooking the conservatory. Steps have been taken to secure a representative collection of works on vital statistics, of reports and regulations relating to public health; of regulations with reference to injurious trades and of works thereon; and of reports, statistics, and other works on the science of education. Foreign powers have been invited to lend their co-operation in this effort to create an international library.

Autumn Exhibition of Architectural Drawings, Liverpool.—The curator of the Walker Art Gallery, instructed by the Arts Committee of the Corporation of Liverpool, has informed the Council of the R.I.B.A. that at the ensuing Autumn Exhibition, to inaugurate the extensions recently made in that gallery, architectural drawings will be exhibited in one of the rooms. Further information will be given on application to the Curator of the Walker Art Gallery, at Liverpool.

Bradford Technical College.—The first annual meeting of the donors and subscribers to the Bradford Technical College was held on the 28th ult. under the presidency of Mr. Henry Mitchell. After referring to the satisfactory nature of the reports from the various departments of the College, the Chairman said the progress of the students was most gratifying. He knew that many of them were already occupying responsible positions in connexion with some of the most prominent manufacturing and other industries of the town, and he had many testimonies from their employers as to the value of the services these students had been enabled to render. He believed it would be necessary for all who undertook positions in connexion with the trade of the town, either as managers or principals, to go through a course of training in that College. The number of students was now over 800, and it was estimated that the fees in the different departments during the present year will amount to £7,185 15s. Government grants to 1880, Clothworkers' Company's grant, 500l., letting of the hall, 150l., 1,000l. from the special subscriptions, besides ordinary subscriptions, the total of which was not yet known. The expenses were large, being about £1,000 a year, according to the present estimate; but if extra subscriptions to the amount of 1,000l. were obtained, the council would be able to meet them.

The Royal Society of Artists, Birmingham.—The private view of the Spring Exhibition of this Society took place on Thursday, the 3rd inst., and the exhibition was opened to the public on the 4th. The committee having decided to give additional space to oil paintings at the spring exhibitions, the walls of the Great Room are this year covered by a collection of works in that medium, the new gallery and some of the other rooms being devoted to water-colour drawings, whilst one room is given up to the exhibition of etchings and works in black and white.

Dairy Farm Buildings.—The ninth annual Dairy Show is announced to take place in October next. One of the sections will be devoted to models, plans, and drawings of dairy-farms, homesteads, silos, piggeries, poultry houses, &c. Competitors will be required to deliver their designs at the offices of the Dairy Farmers' Association, 191, Fleet-street, London, E.C., not later than September 10th. Special conditions with reference to this section will be framed, and will be obtainable upon application to the secretary.

Action Drainage.—Mr. C. N. Bailey, surveyor to the Acton Local Board of Health, writes to say that the statement in an article on the above subject (pp. 403-4, ante) that "the local surveyor, under the guidance of Mr. Bailey Denton, was instructed to prepare a comprehensive scheme," is incorrect, and that the scheme was prepared by himself before Mr. Denton was called in.

Edinburgh Architectural Association.—A meeting of the association was to be held in the Professional Hall, 20, George-street, on Thursday evening, April 3rd, at half-past eight o'clock. A paper, by Mr. W. Scott Morton, on "Colour" was announced as the principal business for the evening.

London and Middlesex Archaeological Society.—In consequence of the death of the Duke of Albany, the conversations of this society, which was announced for 8 p.m. on Thursday, the 3rd of this month, is postponed to the same hour on Thursday, the 24th.

The Royal Gold Medal.—The recommendation that the Royal Gold Medal of the Institute of Architects for this year should be presented to Mr. Butterfield has received the formal sanction of Her Majesty.

TENDERS.

For the extension of premises, Chiswell-street, Camberwell, for Messrs. Carter, Paterson, & Co., under the superintendence of Mr. William Eve, 10, Union-court, Old Broad-street, E.C. —

Hubble & Trott	£1,345 0 0
Barris & Wardrop	880 0 0
D. D. & A. Brown	880 0 0
Downs	839 0 0
Aldridge & Jenney	820 0 0
Higgs	815 0 0

For the erection of four almshouses, Newbury, Berks. Mr. Henry Flint, architect, Newbury:—

S. Elliot	£876 0 0
Elms	840 10 0
Whiter	825 0 0
Bailey	806 16 8
Taylor	777 0 0
Potterford	769 0 0
James (accepted)	743 0 0
Harrison	690 0 0

For the erection and completion of two pairs of semi-detached villas, at Southgate, for Mrs. Caroline Deakin, Mr. Arthur W. Saville, architect, 89, Strand, W.C. Quantities supplied:—

Jernard	£2,897 0 0
Cox	2,686 0 0
Newby	2,689 0 0
Smithers	2,689 0 0
Asley	2,686 0 0
Shurmer	2,674 0 0
Cook	2,671 0 0
Spencer & Co.	2,485 0 0
Walker	2,432 0 0
Ward & Lambie	2,387 0 0
Howard	2,384 10 0
Lambie	2,347 0 0
Jackson & Todd	2,256 0 0
Royal (accepted)	2,076 0 0

For water-tower, Enfield, for the Enfield Local Board of Health. Mr. Ketteringham, surveyor:—

Patman, Enfield	£1,547 0 0
Gardner, Waltham	1,534 0 0
Burmen, Enfield	1,500 0 0
Cooke, Battersea	1,380 0 0
Fairhead, Enfield	1,286 0 0

For the erection of warehouses, offices, and lead-rolling mills at Canon's Marsh, Bristol, for Messrs. Rowe Bros. & Co. Mr. Herbert J. Jones, Wellington-chambers, Bridge-street, Bristol, architect:—

Bastbrook & Son	£1,234 0 0
R. J. Crocker	4,239 0 0
Valters & Son	4,175 0 0
Brook & Bruce	4,159 0 0
Stephens & Bastow	4,000 0 0
W. Church	3,984 0 0
J. E. Davis	3,984 0 0
G. Humphreys	3,977 0 0
B. & T. Hatherly	3,957 0 0
Howell & Son	3,900 0 0
Cowin & Son	3,876 0 0
A. J. Bevan	3,800 0 0
T. R. Lewis (accepted)	3,796 0 0

All of Bristol.

For Didden Hall, Loughton, for Mr. J. T. Palmer. Mr. J. M. Knight, architect:—

W. Wood	£4,697 0 0
F. F. & J. Wood	1,683 0 0
J. Earle & Son	4,600 0 0
Egan	4,465 0 0
Magness	4,400 0 0
Ashby Bros.	4,322 0 0
Staines & Son	4,244 0 0
W. S. Joselyne	3,950 0 0

For the supply of 600 ft. of 18-inch cast-iron pipes for sewer outfall works, in 12 ft. lengths, and other iron work in connexion therewith, for the Bournemouth Improvement Commissioners. Mr. G. N. Andrews, surveyor:—

Amended Tenders.	
A. S. D.	L. S. D.
A. Dodman, Westminster	385 0 0
Thomas Spittle, Newport, Mon.	381 5 0
Edwd. Howell, Poole	350 0 0
Wm. Haydon, Bournemouth	306 5 0
Jordan & Son, Newport, Mon.	291 18 9
Macfarlane, Strang, & Co., London	291 12 0
The Thames Bank Iron Co., London	290 0 0
Firmstone & Co., near Stourbridge	287 0 0
J. & S. Roberts, West Bromwich	287 10 0
J. B. Guthrie, London	275 0 0
The Station Iron Works Co., near Nottingham	269 11 8
Bayley, Mallett, & Co., London	269 7 6
Cochrane & Co., Dudley	269 6 8
The Buttery Co., London	262 10 0
The Clay Cross Co., near Chester	258 19 0
Wander, Walduck, & Davies	234 7 8

Amended Tender accepted.

For the erection of three dwelling-houses and shops, Queen-street, Ramsgate. Mr. E. L. Elgar, architect:—

T. Elgar	£1,700 0 0
Smith & Son	1,359 0 0
H. Bowman	1,333 0 0
C. Home	1,299 0 0
H. Miller	1,230 0 0
White Bros.	1,658 0 0
J. Newby	1,118 10 0
W. Martin	1,100 0 0
W. H. Post	1,100 0 0
Newby Bros. (accepted)	969 10 0

For two houses at Stoneham, near Alfreton, Derbyshire, for Mr. J. T. Harrison. Messrs. Rolinson & Son, Chesterfield, architects. The proprietor provides all bricks, lime, sand, stoves, and chimney-pieces:—

Mason, Slater, Joiner, Plumber, and Plasterer.	Carpenter, and Glazier.
Fisher Bros., Mansfield	£440 0 0
Thos. Gough, Chesterfield	372 0 0
C. W. Hays, Clay Cross	415 0 0
Jno. Roe, Alfreton	370 0 0
Wm. Hall, Pilsley	—
F. Denhall, Clay Cross	379 12 0
Jno. Bird, Pilsley	303 0 0
Jas. Peach, Merton	—
W. Henson & Wain, Pilsley	—
Geo. Wright, Stoneham	360 0 0
Isaac Margerison, Barlow	360 0 0

Accepted.

For the erection of new infants' school, boundary-walls, &c., at Even Swindon, Wilt, for the Rodbourne Cheney School Board. Mr. William Drew, architect, Swindon. Quantities by the architect:—

Phillips	£1,400 10 0
Barrett	1,162 8 3
Buckle & Wheeler	1,160 0 0
Wiltshire (accepted)	1,131 0 0

For alterations to the "White Horse" public-house, Shore-ditch. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, E.C. Quantities supplied:—

Hearle	£1,345 0 0
Shurmer	1,197 0 0
Drew & Co. (accepted)	1,180 0 0
J. & H. Mills	1,088 0 0
Staines	1,078 0 0

For schoolrooms, &c., at rear of Baptist Chapel, Canford Hill, S.E. Messrs. Wilson, Son, & Aldwinckle, architects, No. 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

Additional Class-room.	
Hobbs	£2,689
Taylor & Son	1,972
T. & H. Mills	1,888
Amer	1,880
Nightingale	1,875
Cox	1,874
Shurmer	1,872
Higgs & Hill	1,860
Crocker	1,860
Jerrard	1,800
Holliday & Greenwood Lodge	1,632
Borough Junction	1,575
Brown (too late)	1,575

Accepted.

For road and sewer, Battersea. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. —

Granite. Macadam.	
Cooke	£259 0 0
Mowlem & Co.	625 0 0
Wheeler & Hindle	473 17 6

For the erection of a villa at corner of West-hill-road and Lebnon-gardens, Wandsworth, for Mr. T. S. Howell.

Messrs. Ebbetts & Cobb, architects, 115, Strand. Quantities supplied by Mr. T. E. Money, 12, Buckingham-street, Strand:—

R. Perkins	£1,943 0 0
F. Sanders	1,832 0 0
Macey & Sons	1,777 0 0
H. Harmer	1,764 0 0
W. Holt	1,725 0 0
Steel Bros.	1,490 0 0
H. Baylis	1,596 0 0

For new organ-chamber and vestry to Christ Church, Folkestone. Mr. A. R. Barker, architect. Quantities by Messrs. J. S. Lee & Son:—

W. J. Wiles, Dover	£2,130 0 0
W. A. Goss, Torquay	2,036 2 2
B. Webster, Folkestone	1,884 0 0
G. Prebble, Folkestone	1,982 0 0
Hayward & Paramor, Folkestone	1,858 0 0
H. Urwin, Folkestone	1,832 7 0
J. Q. Pettit & Son, Folkestone	1,800 0 0
J. Dunk, Folkestone	1,790 0 0
W. Brooks, Folkestone	1,666 0 0
H. M. Moody, Folkestone (accepted)	1,630 0 0

For alterations and additions to Westbrook House, near Horsham, and erection of new lodge. Messrs. William Wallace & Ebbett, Bond-street, architects. Quantities supplied by Mr. Frederick Thomson:—

Potter & Sons, Horsham	£2,670 0 0
Goddard & Sons, Dorking	2,520 0 0
Collis & Sons, Dorking and London	2,424 0 0
Robertson, London	2,420 0 0
Richardson & Sons, Horsham	2,346 0 0
Peters, Horsham	2,169 10 0
Toms, London	2,068 0 0
Charlwood Bros., East Grinstead	2,062 0 0

For alterations to Nos. 3, 4, 5, & 6, Wilton-road, Pimlico, for the Acreated Broad Church, Limited. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove:—

Green	£1,698 0 0
Reading	1,568 0 0
Nightingale	1,580 0 0
Scriveners & Co.	1,459 0 0
Martin, Wells, & Co.	1,360 0 0
Scharien & Williams	1,350 0 0
Stimpson & Co. (accepted)	1,280 0 0

For the erection of shops at Crouch End. Mr. W. Smith, architect:—

Anley	£1,184 0 0
W. Shurmer	1,125 0 0
Clark Bros.	1,112 0 0
Hurst	1,105 0 0
Rubidge	1,079 0 0
Dunford & Langham	1,049 0 0
Johnson	1,046 0 0
Larke	969 0 0
Mattcock Bros.	962 0 0
J. Harper	941 0 0
Stevens	923 0 0
B. T. Wood	865 0 0

For alterations and additions to schools at Derby-road, Hasland, near Chesterfield, Derbyshire, for the Hasland School Board. Messrs. S. Rolinson & Son, architects. Quantities supplied:—

James Hoole	£903 15 0
Edward Heath	890 4 8
Charles Marsden	891 14 0
Eustace Tinkler	792 0 0
Amey Wright	754 0 0
Isaac Margerison	731 0 0
Richd. Langley	720 0 0
Chas. Rolinson	720 0 0
Fran. Glossop	685 0 0
Thos. Gough, Chesterfield (accepted)	661 9 0

For alterations and additions to the Eagle Tavern, Chesham-road, Stratford, for Mr. J. J. Simmons. Mr. Frederick A. Aston, architect:—

Hearle & Son	£579 0 0
North Bros.	540 0 0
A. Nicholls	505 0 0
H. Toole	425 0 0
J. J. Furlong (accepted)	399 15 0
C. Mansfield	395 0 0
W. Buckle	363 10 0
J. Webb	345 0 0
J. Young	305 0 0

For detached residence at West Hampstead, for Mr. J. Gibson. Mr. Banister Fletcher, architect:—

J. Mansbridge (accepted)	£2,776 0 0
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For the erection of Orphan age and Hostel at Lewisham, for All Saints' Sisterhood, Margaret-street, W. Mr. E. L. Swatman, architect, 38, Parliament-street, Westminster:—

S. J. Jerrard (accepted)	£10,185 17 7
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[No competition.]

For the erection of a house, shop, and stabling, at Eastbourne. Mr. J. Barley, architect and surveyor, 33, Guild-ridge-road, Eastbourne. Quantities by Mr. E. Young:—
 Cornwell & Son..... £1,365 0 0
 J. Martin..... 1,350 0 0
 Rogers & Hubbard..... 1,295 0 0
 M. Martin..... 1,275 0 0
 W. Backhurst..... 1,270 0 0
 Dore & Sons..... 1,243 0 0
 B. Stevens..... 1,230 0 0
 J. Hurst (accepted)..... 1,173 0 0

For alterations and additions to villa at Upperton, Eastbourne. Mr. J. Barley, architect, Eastbourne:—
 Dore & Sons..... £390 0 0
 J. Martin..... 390 0 0
 Cornwell & Son..... 350 0 0
 M. Martin..... 339 0 0
 B. Stevens (accepted)..... 287 0 0

For the erection of two semi-detached villas, Eastbourne. Mr. J. Barley, architect, Eastbourne:—
 C. Wren (accepted)..... £3,200 0 0

For new approach-roadway in connexion with Hospital for Infectious Diseases, Woodbridge, near Guildford. Messrs. Peak, Lunn, & Peak, surveyors. Quantities supplied:—

Joseph Shelley, Woodbridge..... £233 9 11
 J. & O. Mitchell, Woodbridge..... 783 9 11
 W. Hebburn & Sons, Worplesden..... 719 10 0
 Geo. Garrett, Guildford..... 630 0 0
 T. B. Hayter, Portsmouth..... 555 0 0
 Martin, Wells, & Co., Alderbury..... 475 18 0
 John Bottrill, Reading..... 435 0 0
 Frayne & Co., Birmingham..... 342 9 9

For pair of cottages, Eastbury Manor, Compton, Surrey, for Miss Hagart. Messrs. Peak, Lunn, & Peak, architects, Guildford:—
 Geo. Stradwick, Guildford..... £530 0 0
 Mitchell Bros., Shafton..... 497 0 0
 Geo. Horn, Godalming..... 492 7 6
 H. Pink, Milford..... 487 10 0
 Modified to £475 10s., and accepted.

For detached cottage, Stoughton Park Estate, near Guildford. Messrs. Peak, Lunn, & Peak, architects, Guildford:—
 Bellmore & Smith, Guildford..... £395 0 0
 S. Savers, Stoughton..... 312 5 0
 G. & H. Smith, Guildford..... 300 0 0
 E. Elliott, Guildford..... 285 0 0
 Henry Lunn, Guildford (accepted)..... 232 14 6

For additions and alterations to Titchhurst Board Schools, near Reading. Mr. F. W. Albury, architect, Reading:—
 Geo. Wernham, Reading (accepted)..... £1,760 0 0

Accepted for new business premises, Broad-street, Reading, for Messrs. Heales, sons, & Co. Messrs. Brown & Albury, architects, Reading:—
 T. H. Kingerles, Banbury (general works)..... £2,400 0 0
 Tamar Terra-cotta Co. (terra-cotta)..... 250 0 0

For iron railing to enclose the Catholic Cathedral, Bishop's house, and seminary, Portsmouth, for Bishop Virtue. Mr. Joseph Stanislaus Hansom, F.R.I.B.A., 27, Alfred-place West, South Kensington, architect:—
 Goldard & Massey, Nottingham (accepted)..... £218 17 0

For Lady Altar in the Catholic Church, Norton-road, West Brighton, for the Rev. S. A. Donnelly. Mr. Joseph Stanislaus Hansom, architect:—
 George Porter, Chelsea (accepted)..... £145 0 0

For making up road, Cambridge-gardens, Notting-hill:—
 Stockwell..... £184 7 0
 Meers..... 337 0 0
 Hare..... 335 0 0
 Rogers & Dickens..... 333 0 0
 Felton..... 328 0 0
 Rowell & Robson..... 316 0 0

For alterations and additions to Nos. 1 and 2, Crawford-street, W., for Mr. Lewis Ivis. Mr. W. B. May, architect, 31, Manchester-street, W.:—
 Simpson..... £219 0 0
 Langridge..... 777 0 0
 D. D. & A. Brown (accepted)..... 735 0 0

For fittings and decorations, "The Fleeson" Inn, High-street, Canterbury, for the Star Brewery. Mr. Fred. M. Putley, architect:—
 John Warne (accepted)..... £253 2 0

For the erection of "Esmeralda," Sutton, Surrey, for Mr. Mark Leader. Mr. Herbert D. Appleton, architect, No. 167, Wool Exchange, E.C. Quantities by Mr. F. T. W. Miller, Guildhall-chambers, E.C.:—

A. Newland..... £1,195 0 0
 W. Robinson..... 1,115 0 0
 W. C. Hards..... 1,086 0 0
 W. Smith..... 1,077 0 0
 R. J. Humphris..... 1,010 0 0
 G. Hards..... 985 15 0
 J. B. Potter (accepted)..... 970 0 0

For house at Bromley, Kent, for Mr. W. J. Nichols. Mr. George Lethbridge, architect. Quantities supplied by Mr. Charles H. Goods:—

Lowis..... £2,521 0 0
 Punnett & Son..... 2,519 0 0
 Armand..... 2,414 0 0
 Adcock..... 2,399 0 0
 Byrne & Dunham..... 2,330 0 0
 Scott..... 2,334 0 0
 Harris & Wardrop (accepted)..... 2,294 0 0

For the erection of the first portion of St. Cuthbert's Church, Kensington, and alterations and additions to the temporary church. Mr. Hugh Rounie Gough, architect, 12, Carlton-chambers, Regent-street, S.W.:—
 Belham & Co. (accepted)..... £2,936 11 3

For addition to British School, Croydon. Mr. Robt. Ridge, architect:—

Marrings, Croydon..... £233 0 0
 Legg, Croydon..... 230 0 0
 Bullock, Croydon..... 227 0 0
 * Accepted.

For alterations and additions to No. 3, Samuel-street, Woolwich, for Vicarage for the parish of St. Michael and All Angels, Woolwich. Mr. H. H. Church, architect, Woolwich:—

Fenn & Sons, Woolwich..... £200 0 0
 Coombs, Plumstead (accepted)..... 550 0 0

For a house on the Cedars Park Estate, Walthamstow, for Mr. Sandell. Mr. B. L. Walters, Black's-place, architect:—

Barton..... £219 0 0
 Sampson..... 612 0 0
 Goldworthy & Rickard..... 578 0 0
 Barkel (accepted)..... 576 0 0

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

H. H.—J. M. C.—Rev. H. W.—A. R. B. A. (next week).—F. E. (we have not space to continue the correspondence).—S. Y.—B. L.—B. F. (next week).—F. (where a not the slightest chance that any of the suggestions you make would be adopted).—R. S. T. (cannot say at present).—O. K. B. (next week).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Notes.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the author.

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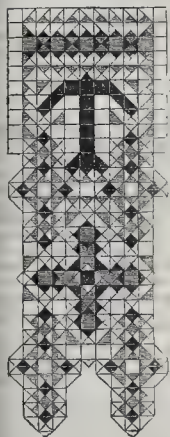
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The Work of the Architect viewed in relation to the Death-rate.

THE subject of the close connexion that exists between the work of the architect and the public (or, rather, the local) health of the districts in which his services are required, is one of extreme interest to the profession. We are not speaking of sanitary measures, properly so called, or of that unseen subterranean portion of the work of construction which silently but forcibly tells its own story. We refer to the

modification which may be produced in the death-rate of a district by quantity, rather than by quality, of accommodation. The lofty structures which are now thickening in every panoramic view of London may be admirable in design, thorough in execution, and duly furnished with means for that inflow and outflow of water on which, under existing arrangements, the public health so closely depends. Such buildings we are apt to regard as unquestionable improvements to a neighbourhood. But, on the other hand, we wish to point out, and that not as matter of theory alone, but as tested, as far as is at the moment practicable, by statistics, that the addition of a second, third, or fourth plane of habitation, by rearing story above story, tends so seriously to increase the density of population within a given area, as to exert an unfavourable effect on health. It is as to this influence of density of population on health that we are desirous of inquiring whether we can attain any results that may be of service to the architectural profession. For such results to have much definite value, it will not be denied, they must have some degree of precision. The general theory will, of course, be admitted. But that is little to the point unless we can find some method of assigning a numeric value to the evil caused by density.

That a general increase of death-rate accompanies an increase in density of population there is no manner of doubt. But any attempt to measure this increase is attended with the difficulty that always opposes the determination of two or three concurrent values at the same time. As a rule, human life may be taken to be increasing in duration in this country. Much is being done, in very different ways, to secure

this end. The habits of the people, the abodes of the people, the physiological and medical knowledge of the advisers of the sick and ailing,—all these are undergoing change, and change for the most part probably of a beneficial character. Thus, if in a given locality there has been a concurrent increase in density of population and in the application of the best methods of sanitary improvement, the movement of the death-rate or disease-rate will be the resultant of three or four causes; nor will it be easy to assign to each one of them its true value.

Again, independently of change there are local values that have to be taken into account. Level is one of these. Level generally has a direct effect on drainage, and thus on health. Thus, in two districts alike in other respects, with the same soil, the same class of buildings, and the same density of population, it may chance that the level of the one may allow of an automatic drainage which is impossible in the other. This difference will tell on the measures of health.

Thus comparing the contiguous districts of St. James, Westminster, and St. Margaret, Westminster (according to data collected in 1871), the density of the population of the former parish was between three and four times as great as that of the latter. The expanse of the park, and the palatial character of some of the residences, in the more sparsely-peopled district, would seem to indicate it as by far the preferable parish. And yet the death-rate in St. Margaret's was 12 per cent. higher than that in St. James's. The denser neighbourhood was more healthy than the less populous and more open district. Why was this? The determination of the level answers the question. The greater part of the parish of St. Margaret is below the 10 ft. contour line. The whole of it is below the 20 ft. contour line. The surface of the parish of St. James rises from the 10 ft. or 20 ft. contours to the 60 ft. and 70 ft. contour lines. Thus whatever be the attention given, in either parish, to the vital question of drainage, the natural advantage of the higher region is so great in this respect as not only to make up for the greater density, but to reverse that sanitary relation which, apart from this condition of level, might have been fully expected to prevail.

Bearing in mind, then, the existence of those local peculiarities which have so powerful an influence, and which, in any sanitary investigation, demand independent determination, we require much and patient toil to arrive at the true co-efficient of density, as affecting health and life. In attempting even an approximate determination, we admit the existence of grave sources of error. That, however, borne in mind, a comparison of the

density and of the death-rate of various districts of town and country gives an approximate rule, which may be suggested to the architect rather for comparison and for correction than for his absolute guidance. But it is at all events near enough to show how necessary it is to carefully consider the effect that will be produced on the salubrity of a district by any great increase in the density of its population, or in the average height of its buildings.

It is difficult to determine the starting-point for comparison. The followers of Mr. George, and the believers in the wonders to be wrought by *la petite culture* and peasant proprietorship, ask, we think, for the allowance of four acres per head of population. Those who desire to arrive at such a result must go to Scotland, where, in 1881, there was a proportion of rather more than five acres to each person. But what was the quality of the land? How much barren heath and mountain is indicated by so low a rate of population? In the United Kingdom the proportion sinks to less than 2½ acres per unit; in England and Wales to less than 1½ acre; and so on, till we come to those districts of London that pile more than 200 inhabitants on an acre.

In a desert, of course, there is no death-rate. But it does not follow that one inhabitant per square mile, or even per acre, is the most healthy ratio of population. To a great extent the mutual aid afforded by neighbourhood will make an increase of population, up to a certain point, a gain. The question is, where is that point? In the inquiries before referred to, as made in 1871, the healthiest district in England was Bellingham, in Northumberland. The density of population was only one to 33½ acres; and the death-rate was 14, the average death-rate for England for the same year being 22. If we take this low rate for a starting-point, the average-death rate for England was as 1.75, the rate for the most healthy district being 1.

This great healthiness, however, is exceptional. Northumberland is the healthiest of English counties, but high level, pure water, and invigorating breezes go probably for as much as density of population. Although the general death-rate is raised by the heavy figure of 27 for Newcastle-on-Tyne, it was as low for the whole county, for the year in question, as 18, and the average density for the county was one inhabitant to every 3½ acres.

But even if we take the areas given by the Registrar-General, and, comparing them with the annual returns of population, arrive at a density rate per district which we can put in a parallel column to the death-rate, we have only rough material to deal with. It is

obvious that if we take a given circle, and a given population, the effect of density of population may still be very seriously varied. We should suppose, for instance, that such a distribution as would give an equable density over the whole area, which is the result of the simple comparison of the two figures given, would be by a long way the most favourable that could be made. But in point of fact we rarely or never find such an equable distribution. We find certain parts of the area in which greater numbers are concentrated, while the population in other parts is comparatively sparse. But the concentration is likely to have a far more injurious effect on health than the more sparing distribution can counteract. This distribution is everywhere different. The value can only be determined by a far more minute and accurate distribution of returns than we possess, or than we are likely, — except in rare cases, — to acquire. Thus we may ask in vain what is the density, and what the rarity, of the most and of the least thickly peopled part of the above-cited district of Bellingham. And even the fearful numbers per acre in the London district of St. Giles's must fall very far to give an indication of the greatest density of its most crowded streets and courts.

Again, there is an annual variation, which may be advantageously represented to the eye by the graphic method of a curve. The death-rate of London is now as low as 21.4 per 1,000, having been reduced from 24.8 for the decade ending 1850, to 22.5 for that ending 1880. But can we hope that this represents a permanent gain? To some extent, perhaps, we may do so, as Sir J. Bazalgette has pointed out that by the combined action of the water-supply and the main drainage a true sanitary improvement has certainly been effected within the last ten years. But if we go back before that date, and examine the curve that may be plotted from 1840 to 1869, we do not see much sign of steady amelioration. The death-rate in 1840 was 24.98; in 1869 it was 24.63. The healthiest year in the interval was 1857, when the rate sank to 22.41. The worst year was 1849, when it rose to 30.14. This range of thirty-four per cent. within eight years is about half of that recorded, in any one year, between the most healthy and the least healthy district of London itself. This, in 1869, was from 17.0 in the Hampstead district, to 29.0 in St. George's-in-the-East, being a difference of 70 per cent. As far as the comparison may be taken for a guide, then, the influence of season on the death-rate may be taken as about half as powerful as that which is exerted by the mean difference of the combined local causes affecting the death-rate of any specified district.

On the above data we shall probably be not far wide of the mark if we consider that drainage (as measured in the remarkable case of the Westminster parishes, by level) has the greatest influence of any determinable cause on local death-rate. Second, when a certain density is once obtained, comes density of population. Third is what we may term the medical health co-efficient of the year. And it is, at all events, certain that the first and the third of these causes will require very careful observation in any attempt that may be made towards the independent determination of the second.

Thus much premised, it may be suggested, not as a matter of dogmatic certitude, but by way of hypothesis, to be tested by the observations of statisticians, when the proper corrections are applied, that an increased density of about ten persons per acre may be expected to produce an increase of one per 1,000 in the death-rate. Thus, the death-rate of London for 1853, according to Sir J. W. Bazalgette, was 21.4. The mean density over the area of the metropolitan water companies' district in that year was 64 persons per acre. The density of the population of Paris at the same time is given by the same authority in figures equal to 111 persons per acre. The difference in the death-rate, according to the rule just suggested, would be 4.7, making the death-rate to be expected for Paris, 26.3. The actual death-rate for the year is given by Sir J. W. Bazalgette as 26.3, the identical figures.

Such an exact coincidence, however, we take

to be, to some extent, fortuitous. Nevertheless it is a simple comparison over a large area. Within London itself we do not find the change of rate to be so serious, but that must, in some measure, be due to the consideration of level. Thus the density of St. Giles, in 1869, was 220 persons per acre, or one inhabitant to every 22 yards of area. The density of London in that year was 36 persons per acre, and, the mean death-rate being 24 per 1,000, the expected death-rate of St. Giles's district, according to the rule under discussion, would be 42.4. It was, however, only 28; but, on turning to the contour map, it will be seen that the district in question is situated on the 60 ft. and 70 ft. contours, and the advantage of 14.4 per 1,000 over the theoretical expectation of death-rate is thus, to some degree, accounted for, as well as by the fact that there is only one hospital in the district.

Again, in the same year, the death-rate of the united parishes of St. Saviour and St. Olave, Southwark, was 29, the highest of any London district. The density of population was 131 persons per acre, or 89 fewer than in St. Giles's; but the entire district is situated below the 10 ft. contour, and is thus not only water-logged, but subject to inundation. Thus, a difference of 1 per 1,000 in the death-rate against the low-lying district, while the density-rate ought, on the foregoing hypothesis, to give 8.9 per 1,000 in its favour, can hardly be dissociated in the mind of the inquirer from the fatal humidity of the soil and the difference of some 60 ft. in level.

Hampstead, it may be added, was the healthiest London district during the period under examination. But here we have the two causes of health, — elevation of level and rarity of population acting in the same direction. The district lies from 120 ft. to 240 ft. above Trinity high-water mark. The density of population was under 9 persons per acre; the death-rate was 17 per 1,000. As to the annual curve, the London death-rate for 1869 was only 0.28 per 1,000 above the mean for the preceding 30 years.

The above important facts are offered, together with the rough rule hypothetically arrived at, for the consideration of those who may be prepared to think out the matter further. In indicating the two disturbing causes of the annual curve, and the influence of level, we only point to two out of numerous causes of variation that will have ultimately to be valued. But, as far as we can see, they are the two most important causes that modify the effect of density. And it must be remembered that the question of level may not depend on subsoil drainage alone, direct as we know the influence of the condition of the subsoil to be in many diseases, notably in phthisis. The effect of the elasticity of the air is not to be ignored. And the physical, or electric, influence of the geological nature of the soil on health is at the same time admitted in principle, and unstudied, as yet, in detail.

The adverse influence of density of population, whether measured by the suggested modulus of 1 per 1,000 for every ten additional units per cent., or in any other way, is a subject that demands the careful attention of all persons interested in building, and that more especially at the present time, when the question of the housing of the poor is under investigation. The density of population in London is kept down by the small size of our houses. The comparison of the numbers of 64 persons per acre in London with 111 per acre in Paris, when coupled with the fact of the greater height of the houses in the latter city, where it is not so very uncommon to have to climb *au huitième*, is a clear proof of this. While in London we find 7.4 persons per house, in Paris we have 29. Now any serious attempt to utilise the costly ground area of Inner London to the highest extent in providing room for habitations will naturally lead to the introduction of a style of building somewhat resembling that of the great monasteries of Italy. Floor above floor rise small cells, connected with long corridors and outer staircases; and the accommodation for numbers on a small area that can thus be attained is such as to make the St. Giles's rate

of 220 persons to the acre appear liberal. It may be all very well to pile such a building on a mountain, where the free air can sweep in from all around. In a city it is another matter. And we hope we have said enough to show that the addition of any new plane of abode, or story of building, in London, must be attended, other things being equal, with a proportionate increase of the death-rate, which even if we cannot at present exactly determine it, may show, too late, that we have been unwise to disregard the danger.

MILITARY ARCHITECTURE.*

MILITARY architecture, as a living art, has long ceased to exist.

Buildings which differ in no material respect from their civilian counterparts are, of course, erected for the convenience of the military service, — barracks, hospitals, schools, and such like, more varied and numerous than ever. But these examples of architecture for the military are not military architecture, which is, properly speaking, the architecture of defensive structures. There was once such an architecture in Europe: for a thousand years it ran its triumphant course, to disappear before the re-adoption of the oldest of all forms of defence, — the simple ditch and earthen mound. The engineer no longer rears broad fronts of masonry scarps or builds the lofty tower for guard and outlook. His art is no longer to resist his enemy by sullen masses of inert masonry, defying escalade, and strong enough to "laugh a siege to scorn." He delays his foe by sunken obstacles and destroys him unseen from behind a secure cover of earthen rampart. The rifle and the spade are henceforth to be the soldier's twin weapons of offence and defence, and the Moncrieff pit is the modern antithesis of the Norman keep.

Every step in the long progress from the simple enclosing hedge or palisade of the unsophisticated Briton to the scientific dispositions of Vauban, is easily traceable in our national examples. The only point in which our British precursors appear to have been equal to their descendants is in the selection of defensible sites, which were always chosen with unerring instinct.

The distinctively national phase of the art of architecture as applied to the science of defence synchronises exactly with its employment for ecclesiastical and civil purposes. "With the exception of a fragment of wall at Corfe it is doubtful whether any military masonry older than the Conquest exists in England," and certainly none bearing the impress of art is of later date than Henry VIII. The Norman William built fewer castles in this country than he is generally credited with. At the termination of his reign those erected by himself and his numerous barons did not, probably, exceed in number a hundred. But, looking to their vast extent, to the prodigious masses of masonry involved in their construction, the distances which much of the material had of necessity to be brought, and the number of artificers required; considering, too, the immense number of monastic and ecclesiastical establishments which date from his reign, even this number cannot fail to strike us with surprise. He found the main lines of approach to the interior of the kingdom and all its vulnerable points defended by earthworks, and these he repaired, enlarged, and strengthened, and with these he was, for the most part, content; adding here and there a keep, and "making the most of what had fallen into his hands." It is to Henry I. that the great number of English castles owed their origin or completion; and Henry II. scattered them over his dominions with so liberal a hand that by the end of his reign, notwithstanding the destruction of those edifices which were considered inimical to the interests of the Crown, no fewer than 650 castles and military works remained intact and serviceable for warlike need. The type of Medieval stronghold was fixed during his reign, and with it closed

* "Medieval Military Architecture in England." By Geo. T. Clark. London: Wyman & Sons.

the great castle-building era in England. That type is familiar to every Englishman, for it is seen in every district in the kingdom. The long lines of *enceinte* embattled at their summits and flanked by frequent towers, the broad and deep ditch in front crossed by a drawbridge, defended in its turn by a machicolated gateway with its own system of flanking turrets; and, towering high above all, the monstrous keep, "four square to all the winds that blow," itself a complete work of defence for reliance in the last extremity of disaster. These, in various degrees of decay and decrepitude, are known to all. The arrangements adopted in each case, though conforming to a settled principle, were infinitely varied in their application:—when a new site was chosen, and the foundation was secure, the keep was built as a tower, accommodating on its several floors prisons, storehouses, guard-room, hall, and chapel, and most precious of all, enclosing the well. This was never omitted, at whatever cost. At Bamborough, one of the most remarkable early wells in the country is found carried down 145 ft. into the whinstone rock,—a work which may well astonish us, and which would give us some trouble even now with all our modern "appliances and means to boot." When the mound upon which every castle stood was artificially formed, the "shell" or hollow keep was adopted,—a little work within a larger one. In the thirteenth century a cylindrical form of keep became fashionable, but it was not, in some respects, so efficient as the square form: its divergent fire from the parapets was not so well calculated to defend its base as the converging fire its predecessor afforded, and many expedients were necessary to restore the balance. A movable *brèche* was erected in times of siege, and some other complicated forms of counter attack were devised. In all these works the hand of the artist appears somewhere. In the entrance-gateway, the doorway to the keep; in the chamber, or oratory, or chapel, the best art of the period is invariably apparent, and lends a grace when all else is gloomy and severe. It is only when we arrive at very late examples that we meet with instances of sily subterfuge and execrable taste. The military architects of the Middle Ages were the equals of the architects of the cathedrals which adorn our land,—if, indeed, the architects of both classes of works were not the same men. In the latter part of the reign of Henry III. the ordinary dwelling-house put on something of a defensive character. It was embattled and moated, and defended by a drawbridge and portcullis,—the licence to fortify such houses forming an important adjunct to the royal revenue. It is probable that outer stockades and perishable elements of defence were also employed. But soon the hopelessness of holding out against the attacks of artillery, and a growing desire for "liberty and light," changed the aspect of such houses. Windows were opened through their enclosing walls, and the architecture of defence was adopted more as a fashion than for its serviceableness against anything but the desultory assaults of predatory vagabonds, or the undisciplined and unfurnished mob. In the sixteenth century the Englishman's house ceased to be, in a literal sense, his castle, and a new type of nobles' residence arose. With the decay of the defence of isolated houses remained, however, the defence of towns, and there is a nobility about the long indented lines of scarp which, until the other day, girdled in many of our important cities. The few survivors are disappearing or are doomed to disappear. The towns they once enclosed have overflowed their bounds, and the old line of ramparts is succeeded by detached earthen forts, scarcely distinguishable from the upland meadows from which they rise like great anti-hills, a couple of miles away. Henry VIII. was a determined fortifier, and to him many of these old lines are due. He also lined our southern coast with castles,—at Deal, at Walmer, Sandgate, and other points. Charles I. shared his views, and added to the fortifications at Sheerness, Chatham, and other places of importance to our shipping, and the very last appearance of the military architect was seen in the chain of martello towers which, dating from the very

beginning of the century, dot the curving beaches of our Channel coast.

From time to time exact and interesting accounts of the remains of the Mediaeval military architecture which are scattered throughout the land have been contributed to our own pages by a skilful hand,—that of the author of the work which suggests these reflections. The student who would get at the full lesson which these remains convey must possess many qualifications. He must have a close acquaintance with the by-paths of European history. He must be in a wide sense an antiquary and an archaeologist. He must have sufficient acquaintance with the niceties of architectural detail to avail himself of the clue which this gives in determining a date, and he must add to the most patient investigation the power of generalising soundly from a multitude of facts. He must, moreover, have abundant leisure, and be quite independent of the prospects of any pecuniary reward for his protracted labours. It is probable that there are not half a dozen men in England who are in every point fully equipped for the study and exposition of our ancient military architecture. It is certain that no one could be found more competent than the author of the two handsome volumes before us.

In a preliminary introduction,—which extends to 172 octavo pages,—he gives a succinct account of the rise and development of military architecture in England, tracing with unique skill the *rationale* of the art, and following its most recondate ramifications.

Following thereon is a detailed account of almost every considerable example of the art now extant, illustrated by plans, and sometimes by elevations, sections, and details. The Tower of London is treated at great length in a reprint of the writer's well-known and masterly monograph; and such noble examples as Caerphilly, Berkeley, Alwark, Arundel, and others are examined and elucidated in the most thorough manner. A few curious but unimportant verbal errors have crept into the text, puzzling at first to the architectural reader. In a new edition the whole should be carefully revised in this respect; and as some of the articles are half a century old, they should be either brought up to date, or dated.

In taking leave of one of the most interesting works which have lately come before us, we cannot refrain from expressing a regret that it is not illustrated by a good map showing the general defensive scheme of the Norman engineers, and the positions of the several works erected or projected by them to guard the main lines of road and river. Such a map of the Scottish border and of the Welsh marches would be of great interest, and by the clue thus afforded many a landowner might yet discover some of the undiscovered works to which either tradition or written records point. It would add a special value to a book which wants only this and an index to be as near perfection as possible.

NOTES.

SIR WILLIAM HARCOURT'S able speech on Tuesday night, in introducing his Government of London Bill, will probably do much to prepare the Bill for its successful passage through the usually troubled waters of a second reading. That it will be subject to much criticism we cannot doubt; but we think every impartial mind will recognise the general moderation of Sir W. Harcourt's proposals, and the logical spirit in which they were worked out. Sir William based his argument for centralising and combining the governing authority partly on the extent of work which had been carried out by the Metropolitan Board of Works, who to some extent, and in regard to some subjects, represented a kind of central authority such as the Bill proposes to establish for all matters with which local government ought to deal; and he pointed out that when there was work to be done which might be done either by one of the various vestries or by this single body, the Board of Works, it had almost invariably been given

to the single body. The first reading passed without discussion. Every one will look with interest to the second reading; but we can hardly prophesy other than success to a scheme which promises to put new life into London government, to secure us against the partial and often conflicting action of vestries, with their petty interests, and which will, we hope, inaugurate a more high-minded and truly public spirit than we see at present in either the Corporation of London or the Board of Works, both of which display in their motives and methods but too much of the essential spirit of vestry-dom.

THE last number of the *Journal* of the Society of Arts contains a report of a paper read on Wednesday, the 2nd, by Mr. Elijah Hoole on the "Dwellings of the Poor," portions of which go to confirm what is remarked elsewhere in our present number, that much of the difficulty of comfortably and decently housing the very poor arises from the ways and habits of the people themselves. Mr. Hoole is in favour, as others have been before him, of recognising the absolute necessity for a certain proportion of single-room tenements for those who cannot afford to pay a remunerative rent for anything more, but then he would have the rooms planned and constructed for the purpose, and the occupants looked after and kept in order. This latter side of the requirements seems to be very unpopular with those for whose real benefit it is intended. A speaker in the discussion that followed the paper gave a melancholy account of his own experience in dwelling accommodation:—

"He said he lived in a court near Drury-lane; in a house not a brick of which was sound, and portions of which were absolutely fastened together with floorcloth, but which produced nearly 156l. a-year. For the wretched room in which he and his son lived, in which there was hardly room to turn, he had to pay 4s. a-week. He denounced the notion that this state of things could be remedied by charity or philanthropy, and said that if he could afford the rent asked in the model lodging-house, he would not consent to live there subject to the restrictions which were imposed. He maintained that dwellings could be erected far more economically, which might be let at 1s. per week per room."

This speaker was very probably one of the few who would be disposed to make the best uses of such accommodation, but there are many who could not. An East-end clergyman the other day had an offer from a benevolent lady in the west to provide screens to separate the sexes in one-room houses, and to send down as many as were asked for, at her own expense. "Why," was the clergyman's comment, "the screens could in nine cases out of ten be sold the next day for what they would fetch as material!"

THE subject of the Wellington statues, old and new, existent and possible, came up again in Parliament on the 4th inst., when Mr. Rylands asked if it was still the intention of the Government to abide by the decision announced on the 9th of August last, to invite a competition of sculptors for a new statue of the Duke; and the irrepressible Mr. Cavendish Bentinck put to the First Commissioner a string of interrogatories, including the query whether a commission for a new statue was to be given to "a foreign artist," and whether there was no native British artist to whom this "national work" could be entrusted. The reply on these heads was that the idea of a competition had been abandoned, partly because it was understood that "the leading sculptors would not compete" (no wonder, after the results of some recent sculpture competitions!), and that Mr. Boehm had been selected by the Committee to execute the new statue. Of course, as Mr. Shaw-Lefevre hinted, it would be absurd to object against Mr. Boehm as a "foreign" artist, since he has been elected a member of our own Academy; even if the rule of "English artists for English work" were to be regarded as *de rigueur*, which we doubt. But Mr. Boehm may certainly be said to be a very fortunate sculptor; and, perhaps, it was a tacit feeling that, considering the constitution of the Committee, the result was likely to be just the same whether they competed or not, which induced the disinclina-

tion on the part of other sculptors to sacrifice their time on what was likely to prove only a perfunctory contest.

We have received from the Association of Public Sanitary Inspectors a copy of a paper read on the 5th inst. by Mr. Thos. Rees, rural inspector of nuisances at Guildford on the Public Health Act of 1875, considered mainly from a rural inspector's point of view. Mr. Rees urges that the provisions of the Act that are now applicable only to Urban sanitary authorities should be made compulsory for the whole kingdom. "If the law had been made to apply equally to Urban and Rural districts, as now understood," says Mr. Rees, "many a rookery would never have been built, and houses would not have been erected as they now are, to the great disgust and sorrow of many a local authority. I know a place whereon nineteen cottages are built, and some being built on a piece of land whereon, in an urban district, three only would have been allowed to be built." Mr. Rees supports Mr. Monckton's Bill, now before Parliament, whereby he hopes that more extended and irresponsible power will be given to the sanitary inspector, or, rather, that he will be made responsible to a central authority, and put above the influence of those to whom the recommendations he would be glad to make are unwelcome as contrary to their own interests. The paper concludes with a good many detailed suggestions for amendments to various clauses of the Act as at present existing, which seem to be conceived in a practical and sensible spirit.

THOSE who have hitherto had no idea of the way in which a very large section of our poor live, have it vividly brought before them in a recent work on the canal-boat population by that well-known philanthropist, Mr. George Smith, of Coalville. It is a fearful thing to have the fact brought before us that a rising generation of over 30,000 young children are being brought or dragged up in dwellings the sole living-room of which has an area of 6 ft. square. How can the simplest elements of morality be carried out under conditions such as have been brought before those who have investigated the facts, where a dozen or so of adults and children are huddled together in one diminutive cabin? To counteract the evil effects of this life the Canal Boats Act Amendment Bill, which is endorsed by Mr. Burt, Colonel Makins, Mr. Samuel Morley, Mr. Pell, and Mr. Broadhurst, has been introduced, and it is hoped that, even in the present chaotic condition of Parliament, so short but so important an Act may be got through.

A MEMORIAL is to be presented from the Society of Antiquaries of Scotland to Mr. Gladstone, praying that the usage of the ancient hall of Edinburgh Castle as a military hospital should be discontinued, and that the hall should be "restored" to its pristine condition. The military authorities are understood to have come to the conclusion that the building is unsuitable for the purpose for which it is being used; and its abandonment for that purpose would furnish opportunity for removing the floors and partitions with which it has been cut up for practical purposes. It is suggested that there will be sufficient remaining of all the details to afford means for restoring the whole. This, however, need not, we presume, be looked upon as an inevitable consequence of the clearing out of the hospital and the structural additions in connexion with it. The mere removal of these additions, leaving the ancient work as it stands, might be a practicable method of proceeding, and meet the feelings of those who have begun to find that the interest of restored buildings has palled upon them. The Society for the Protection of Ancient Buildings will, no doubt, be prepared to take reverential measurements of the floors and partition-walls before they are removed, so as to preserve the memory of them to posterity.

WHILE the inhabitants of the Holborn District are to be congratulated on the recent completion of the widening of Gray's Inn-

road, they and their neighbours of Clerkenwell and Islington will do well to leave no stone unturned until they succeed in getting the Metropolitan Board of Works (or the new Municipality for London) to carry out an improvement which has long been demanded by public necessity and safety. We allude to the construction of a new street from the corner of Gray's Inn-road and Clerkenwell-road to the vicinity of the Angel at Islington, to accommodate the yearly increasing traffic between Holborn and Islington, which has no alternative but to make a long *détour* or to go *à la* the present constricted Elm-street and the hilly Mount Pleasant,—a most dangerous and awkward route, the so-called "Mount Pleasant" being another and only a slightly mitigated version of Holborn-hill and Snow-hill before the Viaduct was built. We note that at the last meeting of the Metropolitan Board of Works a large deputation from the localities interested attended in support of a memorial from the local authorities asking the Board to obtain power from Parliament to effect the improvement. We believe the Board are not unwilling to carry out the improvement; in fact, it has been included in at least one of their Parliamentary Bills, but abandoned in favour of projects that were deemed to be more urgent.

On Tuesday, the annual Loan Exhibition, as it has now become, was opened in St. Jude's Schools at Whitechapel. Since Mr. Barnett, the vicar, four years ago hit on the happy idea of utilising the empty school-rooms, during the Easter holidays, for exhibiting pictures by high-class artists to those who seldom have a chance of seeing good pictures, these exhibitions have been a continued success, and have been visited by crowds of people every Easter. The present exhibition contains works by Messrs. Millais, Watts, Boughton, Briton Riviere, &c., and among deceased artists Poole and Constable are represented. We can only regret that Mr. Barnett could not be satisfied with letting people become acquainted with art as art, instead of inviting Mr. William Morris down to dole out to the people crude and Utopian nonsense about the connexion of art with Socialism, and to make statements to them which are absolutely in contradiction to historical fact. Artistic greatness, and artistic inspiration of the higher order, have never in the past had any necessary connexion with social equality or the rights of labour. The impartial analysis of the state of art and society at the Renaissance period would, in fact, almost lead to the opposite conclusion; and to tell people that art could only exist at all so long as it was art for the many, and that it was a question between that and no art at all, is simply to "say the thing which is not."

We commend to the notice of the minority who can take in more than one side of life, a little book on "Express Trains,"* by Mr. Foxwell, which appears to be an expansion of two papers which had previously appeared in certain periodicals. The remarkable point about the book is that the writer appreciates equally both the statistical and the romantic side of railway travelling, and, with the exception of a little too great exuberance of diction in regard to the last-named side of his subject, treats them equally well. The statistical paper is valuable as giving the records and the meaning of railway statistics as to speed and other conditions on various lines, in such a manner as to be really readable and interesting to the general public, who may learn from these papers something more than most of them know at present as to the methods and working of our splendid railway system, which in most points has not its equal in the world, and in regard to which the hundreds of thousands who make use of it are, for the most part, deplorably ignorant. The writer shows, too, how the railway system throws light on national and local character. "The energy with which our trains are managed" is shown by comparison of the work of an ordinary long-distance express in England, a heavy train carrying all classes, with the very best long-

distance express in France (Paris to Marseilles), a light train of first-class only, but which is below the speed of our ordinary express. Other statistics show that south of the Thames people pay nearly double what they pay north of it, for inferior train services: "the North of England towns would not submit to these services, but the crowds of individuals who breathe London air seem incapable of the joint energy which in other localities would soon put an end to such grievances." In speaking of the poetic side of railway travelling Mr. Foxwell rises to enthusiasm, which those who understand most of the subject will be the last to think exaggerated. An express train is as good as a Beethoven symphony; indeed, to him "Bradshaw is the score of a symphony that goes on day and night." Those who remember "the Scotchman" at York in the icy winter of 1879-80, "when the few travellers who were not thawing themselves at waiting-room fires used to stamp up and down a sawdusted platform under a darkened roof, while day after day the train came gliding in from Grantham with couplings like wool, icicles pendent from the carriage eaves, and an air of punctual unconcern, or those who have known some other equally sterling trains" will, he thinks, pardon a little enthusiasm on the subject. We will, at all events; and we only wish that some of the people who, shut up in their own prejudices, keep declaiming against railways as at variance with all the poetry of life, could have their eyes opened in the same way, and instead of mooning over the past, could learn to see what a poetry there really is in this strong, stirring, beating heart of the life of to-day, and not least so in the railway system which makes its life-blood circulate, and which is as intense an expression of human energy as the Medieval cathedral.

THE DECORATIVE USES OF METALS.*

The Decorative Use of Bronze in the Past.—Bronze differs from brass, it is well known, in its ruddier colour, and from the absence of zinc or any metal that oxidises extensively when exposed to the air, it practically defies even a London atmosphere. When clean it is of the colour of copper, but it rapidly tarnishes to a dull brown, and under varying conditions of age and preservation assumes those varied tints or patinas that are so highly prized. The earliest works met with in our country, other than weapons, are prehistoric, and mainly derived from the Irish peat bogs. The early Christians in Ireland seem to have been well acquainted with the use of bronze, and some of their bells and other objects are of exquisite workmanship. Massive bronze fonts are certainly known to date from the tenth century; and at Hildesheim there is not only a very fine font, but the cathedral doors are of bronze, and there is a finely-ornamented column in bronze hard by that was removed from it. Although no examples of bronze doors remain in our country, there are many besides those at Trenheim on the Continent, particularly at Trenheim and Verona. At Lubeck there are two solid bronze benches whose sides have bas-reliefs of knights in the conical helmets and mail of the Bayeux tapestry. These bring to mind that most colossal of all bronzes, Trajan's column at Rome, and the ancient bronzes of Greece and Italy. Remarkable among these are the bronze horses of St. Mark's, brought, tradition says, from Marathon; but most striking, perhaps, are the two Nubian boys from Herculaneum. These are poised on one leg in an attitude of intense expectancy, with all their muscles strained, waiting the signal to start a race. The artist did not disdain to resort to the use of glass for the eyes, and these, with the glossy black patina that all the Herculaneum bronzes have assumed, give an extraordinary reality and earnestness to the figures. To come back to our own country, however, we possess a splendid series of monumental bronzes in the form of recumbent effigies, such as the splendid examples in Westminster, Eleanor and Henry III., Edward III. and Richard II.,—that of the Black Prince at Canterbury, the Beauchamps at Warwick, &c. Monumental works in bronze are too numerous to treat of here; but such exceptional works as the sarcophagus by

* Published by E. Stanford, Charing-cross.

* See p. 471, ante.

Vischer at Nuremberg, the sumptuous tomb of Maximilian at Innsbruck guarded by two rows of knights in full armour and dames of heroic size, and Michelangelo's tombs of the Medici at Florence are familiar to all. The Renaissance was marked by much fine bronze work, as the Ghiberti gates and the Perseus of Cellini at Florence, the Sansovino bronzes of Venice, the Donatello and other bronzes of Padua, and hosts of lesser works. There are also the bronzes in the Louvre, &c., of Cellini, Jean Goujon, and Clodion; and now, for the first time since the fall of the Roman Empire, the custom of erecting outdoor statues was revived. Our English series begins with a statue never surpassed in England, though it yields to some of the still earlier equestrian statues of Italy,—that of Charles I. at Charing Cross. But mention of these must be reserved till later. The Napoleon Column of the Place Vendôme and the statue of Bavaria near Munich are among the most remarkable efforts of modern date.

Lead.—Of lead little can be said from an artistic point of view, except that repairing lead roofs has led to an immense destruction of irreplaceable works of art. The graceful *flèches* of some French cathedrals and high roofs of châteaux and finials are of lead. In our country we have little more than two or three very early fonts in lead, a few spouts or gargoyles, some panelled and ornamental cisterns, the statue of one of the Georges which disappeared from Leicester-square, the kneeling negro with dial in Clement's Inn*, Shakspeare's bust, Drury-lane Theatre.

The Decadence of the Art of Working Metals.—We have seen how a complete change in public taste led to the extinction of artistic forging in iron late in the last century. The artistic working of brass and bronze suffered similar vicissitudes, though good work was produced for a few years longer in these metals. All gave way, however, before the utilitarian and feverish spirit that possessed the nation during the period which gave birth to such mighty results as railways, steamboats, the spinning-jenny, gas, and the electric telegraph. Until 1851 all art was dormant in this country,—if not dead,—but this "World's Fair" seemed to revivify all except the long-forgotten one of the blacksmith. A great display was brought together of objects that were then considered an immense advance beyond the miles of cast spear-headed railings that lined our street areas for miles and fenced in every open space. We smile now at the vulgarity of the clumsy and redundantly ornamented iron castings that received the highest awards, and wonder that the possibility of forging more graceful things by hand seems hardly to have been recollected, yet it is more than probable that in those days, when steam was king, work of this kind produced by hand would have been little esteemed. Be this as it may, while such arts as those of staining and enamelling glass for windows, working in gold and silver, reproducing long-lost lustres or glazes in ceramics, were in the full tide of revival, the decorative uses of forged iron or hammered brass were almost confined to ecclesiastical purposes. For thirty years nothing but cast brass gasfittings, painted in the worst Birmingham taste to imitate bronzes, and cast-iron stair-rails and grates, could be purchased by the public for domestic purposes,—though, under the careful tuition of leading architects, good if high-priced ecclesiastical brass-work was always forthcoming. In forged iron, however, little was produced except a few candelabra and altar-screens of designs only suitable for brass, finishing in finish, ornamented with jewels, colour, and gilding, and altogether lacking the breadth and ease of treatment so inherent to the material, and which distinguished it in former days. It is only after repeated exhibitions abroad have brought home to us that our foreign rivals are now fully alive to the value of the proper treatment of metals in architecture, that artist-minds in our great metal-producing country have been stirred themselves.

Its Revival.—The art of designing and working artistically in metals, after a long period of decay, is gradually reviving. One after another of our architects, of the many who are imbued with the true spirit of art, are using wrought metals where before they had used cast, and the work of the skilled hand and brain, where before they were content to use the stereotyped products of the foundry and

the machine; yet the average of the wares manufactured for sale and bought by the multitude remain almost as debased as ever, and the question is by what means can a truer standard be introduced. There are many professed designers of metal work, and especially of gas-fittings, yet scarcely any are able to emancipate themselves from the conventional and stereotyped ideas that for so many years have been formulated from Birmingham.

The Principles of Design.—Let us endeavour, in the first place, to arrive at some definite ideas as to the principles that are to guide us in designing work to be carried out in metal, and, in order to do so, let us clearly distinguish the various properties and capabilities belonging to each metal to be treated.

It is, of course, a truism to say that metal-work should be designed according to the true principles of art. But what are these, and how can they be defined? Unlike an exact science, the ideal of beauty, which is art, is intangible, and differs according to the taste of races and the constitution of individual minds; and this natural diversity has become accentuated by diverging habits of life, of surroundings, and of education. The cultivated Northerner would hardly accept the surroundings that would be grateful to the softer Oriental, nor a sensitive and highly-cultured man be satisfied with the glittering redundancy that is the highest form of art to the haunter of refreshment-bars. All this goes without saying, yet a professed designer must have some principles to guide him if he is to produce good work, and it should be the endeavour of those whose duty it is to teach to avoid the airy vagueness that takes possession of lecturers on art, and to reduce, at all events the elements of design, to some exact principles capable of being defined.

The cardinal point appears to be that the designer should commence by acquiring a thorough knowledge of the capabilities of the material in which the design is to be carried out and should keep this steadily before him, and make the construction apparent and part of the design, and the ornament subservient to utility and strength, if either of these qualities is required. To design for metal-work it is not absolutely necessary to have served an apprenticeship to a blacksmith, a brazier, and a founder, though this would be an advantage, but the designer must have watched at least every part of the processes till he is thoroughly acquainted with the difficulties that have to be overcome, so as not to tax unnecessarily the skill of the operative.

Of Wrought Iron.—In the treatment of wrought iron we must first consider what are its special properties, in order to utilise them to the utmost degree that may be necessary. We find, then, that, while sharing with gold and silver and platinum the property called malleability, it far surpasses them in hardness and tenacity,—that is, the power of resisting a strain tending to draw or burst its molecules asunder. It can be drawn through rollers into railway iron, or into wire as fine as the finest thread, and it is rolled into plates fit to armour an iron-clad, or into leaves the forty-eight-thousandth of an inch in thickness. It can be bent in any direction, and hardened or softened at will. It is these properties which make it so facile an instrument in the hands of the smith. Malleable iron fit for the forge is prepared in a somewhat different way to that intended for casting. The actual processes by which the ore is converted into "pig" and from the "pig" (which would crumble into fragments under the blows of a hammer) into iron fitted to take the most beautiful forms, would occupy many pages, but it is finally fashioned into short bars, thence taken to the "squeezers," and on to the rolling-machines, in which it is laboriously reduced to the bars or plates of the forms and fibrous structure and toughness required by the smiths. Out of these bars or rods or sheets of iron, of various thicknesses, all the various flowers and foliage, scrolls, and interlacing in which the skilled smith revels, have to be produced. With no other tools but the forge, the anvil and the hammer, the vice, and a few minor chisels or punches on occasion, the artist produces by repeated beatings and weldings and hammerings work whose delicacy rivals that of the goldsmith, or whose massive strength would make a prison-door. The actual processes used by the smith are few, and easily mastered, and all beyond depends on the individual talent, neatness, and appreciation of the operative. In

a material of so little intrinsic value, yet so malleable, so tough, and so enduring, the aim should be to produce a beautiful and graceful, free and ever-varying effect, bold in relief, elegant in contour, and strongly welded and riveted together, without visible effort. And the treatment of the simple scroll, curled and bent as it may be in endless variety, drawn out and tapered in proportion, is undoubtedly the best. Flowers and foliage of conventional type may be sparingly added when a richer effect is desired; but it is in questionable taste to reproduce, as in the celebrated gates of Hampton Court, richly embroidered and fringed draperies, and to make so lavish a use of highly elaborate foliage and insignia. Even as mere *tours de force*, some of the intricate sixteenth-century grilles, which probably presented no less technical difficulty, and occupied, perhaps, relatively an equal time, are preferable. As instances of good effects produced by the simplest means, we may take the familiar Venetian chain and some grilles which are made up entirely of small scrolled pieces of iron, and whose beauty is wholly due to the judicious piecing together of these. In all such the rivet-heads and collars are made an important feature of the design. Mouldings, except in Medieval work, should be avoided, as the labour to produce them is disproportionate to the effect gained, and in long runs of railing it should be borne in mind that the introduction of panels of simple scroll-work at intervals is less costly than to shape the terminal spikes into spear-heads simulating cast work, cast heads being, in fact, very often welded on to the bars in so-called wrought work. For staircases a flowing treatment is often actually cheaper than a treatment of upright bars, and is, in many cases, far more graceful and artistic. An alternation of close and open panels produces a charming effect, and provides strength and rigidity are apparent at intervals, the filling-in may be of almost lace-like character. Wrought open-work newels are exceedingly graceful, and even lamp-columns, of pieces firmly welded and riveted together, can be made most beautiful objects. Wrought iron, again, is peculiarly adapted to the canopies of drinking-fountains, and laid over a roof of gilt copper has the richest possible effect. It is a matter of surprise that no work of this kind has been erected in England, though the price would be far lower than the modified tombstones that are put up at street corners. A good deal is to be said in favour of wrought-iron movable dog-grates, both in point of convenience and effect. Of lanterns and gasfittings in wrought iron it is impossible to speak, so endless are the possibilities. Great lightness should be the aim for indoor purposes, except for schools and public places, and in designing electric-light fittings the very acme of lightness may be obtained. There is great danger always, in striving to produce for these purposes designs that shall be original, that the merely eccentric will be mistaken for quaintness, and oddity for genius. This danger will be greatly lessened if the practical utility of the object is made the first consideration, and the sense of proportion maintained. The ironwork can be brought to the brightness of armour if wished, and preserved so with a very thick coating of oak varnish, or it may be picked out in colours and gold, or entirely gilt, or lacquered to the tone of old gold. In the latter case it makes a beautiful combination with Venetian glass, and in all instances glass is of great assistance. Most frequently it is best left of a semi-dull blackness.

Though, to watch a dexterous smith, all the processes seem exceedingly easy and simple, yet they are very difficult of execution by an amateur. If economy be desired, the iron should not be chopped into small pieces, as this entails expensive fitting, neither should many very sharp bends be introduced nor many scrolls made to spring from one stem, as this leads to much welding, but the iron should be kept in long pieces and every end utilised.*

Proposed New Almshouses at Brixton.

At a meeting of the Court of Common Council on the 3rd inst. it was resolved to rebuild the City Freemen's Almshouses in Shepherd's-lane, Brixton, belonging to the Corporation, at a cost not exceeding 11,500*l.*, and it was further resolved to instruct a committee to advertise for designs and estimates, and submit the plan selected for the final approval of the Court.

* To be continued.

* Since this paper was written this figure has been removed, we know not whither.

FURTHER EVIDENCE ON THE PARISIAN BUILDING TRADES.

THE transformation of the old into the modern Paris has not only supplied an exceptional amount of work to those who have built the new boulevards and new districts, but those whose mission it is to destroy have been nearly as busy. The old historical quarters, picturesque and unwholesome, have been cut through and through by the monotonous splendour of the modern boulevards. A healthy current of fresh air filtering through the luxuriant vegetation of the trees that line each side of the way now passes over the noisome quarters whence the revolutionary hordes of starving people emerged to storm the Bastille and overthrow the monarchy. The house where Marat was murdered; the inn where Charlotte Corday descended when she arrived in Paris on her mission of assassination; these, and many similar relics of the great revolutionary period, have all been pulled down within the last few years; for the Haussmannisation of Paris was continued long after M. Haussmann and the Empire had disappeared altogether from the scene. And now that there seems little or nothing more to be done, now that the fever for building has exhausted itself, the workmen whose task it is to clear the ground, to demolish the old so as to make room for the new, find themselves without employment, and are bitterly complaining because the work of regeneration cannot be commenced all over again. Nor are they alone in this; their employers are equally in distress, and, like others in the same position, have resorted to that hall of lamentations, the committee-room where the Commission of the Forty-four patiently collect evidence on the industrial crisis.

Messrs. Groselonde, Picart, & Meygret, master contractors for the pulling down of houses, &c., stated that in ordinary times there were at least 1,500 workmen daily engaged in destroying the old dwellings of Paris, but that now barely a third of this number could find employment. The ordinary wages paid are estimated at 6d. the hour for the journeyman, and 4d. for his boy or assistant. When, however, there is an extra amount of work to be done the wages increase to the extent of a 1d. or even 1d. per hour. This testifies to a slight improvement, as fifteen years ago the men only earned 5d., and the boys 3½d. the hour. There are no self-created benefit societies in this trade, but the men are insured against accidents. The premium is paid, half by the employers and half by the workmen, the amount being deducted from their salaries. In other words, the insurance is rendered compulsory by the custom of the trade, and the sum paid is fixed at 11 centimes for each day of eleven hours' work. Sometimes, when business is very slack, the employer pays the entire premium, which is equal to 1 centime for every hour of work, or 1d. for ten hours. In exchange for this, should the workman be killed, his widow would receive 280l.; and if he is wounded he obtains an allowance of 2s. per day till he is cured. The workmen, however, are said not to understand the working of this system of insurance, and look upon the deductions made from their wages as a sort of tax, which they often resent. The trade is not limited to the demolition of old houses; for the same contractors traffic in the sale of the old materials, which are often used in the building of new houses. For this purpose, some 600 carpenters and joiners were employed to trim and repair the old timbers, the doors, windows, &c., that might be used again. Now, however, new doors, all ready-made, are imported from abroad, and can be purchased in Paris for 5s. 5d.; while, formerly, the joiner was paid 4s. 7d. merely for making the door, without counting the value of the wood. Under such circumstances, contractors find themselves compelled to dismiss the French workmen, and import these things ready-made from Norway and other countries. The witnesses further insisted that the spirit of class animosity which was rapidly gaining ground helped to intensify the crisis. They protested that the employers were not interested in grinding down the workmen. They felt, on the contrary, it was best for all parties, even for the masters, that the men should be in the receipt of good wages, and lead happy, comfortable lives, and this they proved by seeking to help the workmen in times of depression by retaining their services when there was really little or nothing for the

men to do. But the interference of the Municipal Council, which had, by its example, established a very high scale of wages, contributed greatly to disturb the trade. Workmen were now always dissatisfied unless they were paid according to the town tariff, and this was altogether beyond the powers of some of the employers.

The delegates from the union of the masters who clean, mend, and construct fireplaces, chimneys, stoves, &c., expressed similar opinions with respect to the town tariff. They also related that there were about 350 masters, employing some 3,530 men, in their trade. The workmen now receive 5s. 10d. per day, their assistants 3s. 2d., which represents a very great increase; for, in 1862, they were only paid 3s. 10d. and 1s. 10d. respectively. On the other hand, this is one of the few trades connected with building which has not suffered in a marked degree from the present crisis. Apart from the building of new houses, repairs and alterations of the existing dwellings provide sufficient work for the trade. It is only those firms connected with societies for building on credit which have suffered. The treaties of commerce and foreign competition produce but little effect on this business; but, on the other hand, the trade is almost exclusively in the hands of foreigners. At least two-thirds of the employers are not Frenchmen, and more than half the workmen come from abroad. Those who are French are not Parisians, but Auvergnats, while the others are for the most part either Italians or Swiss. As the winter is naturally the busy season, a large number of the men return to Italy for the harvest-gathering, where they work in the fields. All the men are laborious and economical, and almost invariably save a considerable portion of their wages, so that in old age they are able to buy small plots of land, and live peacefully in their native mountains. Some time ago 102 employers founded a mutual assurance society, to enable them to assist their workmen in times of illness, and when the law legalising trade unions comes into force, it is thought that this trade will be able to create a very powerful benefit society.

The master manufacturers of electric bells, acoustic contrivances, and lightning-conductors also gave evidence of a reassuring character. They had work to do in the old houses where modern electric appliances are introduced, and therefore did not feel the effects of the present trade depression. At the same time, fears were expressed that this would not suffice to provide employment for the trade for an illimitable time. As a rule, some 400 workmen were engaged in this branch, though the number now actually at work was not quite so large. The day's work is fixed at ten hours, and this all the year round. The salaries vary from 5s. 7d. to 6s. 5d. per day. From 1867 to 1874 the wages did not exceed 4s. 10d. per day, but now that they have increased so largely, the employers only retain the ablest workmen during dull seasons. But for the industrial crisis this trade would have developed very considerably, foreign exportations have fallen off to the extent of about fifty per cent., and this is attributed to the prohibitive custom-house duties imposed by many foreign powers. On the other hand, the reduction of home business through the cessation of building is estimated at about twenty-five per cent. German competition is felt in the foreign, but not in the home markets, and the success of the German firms is attributed to the very low wages the workmen accept.

The delegates of the Paris engineers and mechanics gave more than a mere account of their trade. They propounded a politico-social programme that is of interest as emanating from one of the most intelligent bodies of French workmen, who are often, indirectly at least, connected with the building trades. The workman who acted as spokesmen were MM. Delahaye, Carry, and Aucourdier. The former had lived for some time in England, and was a member of the Amalgamated Engineers' Society. They attributed the present crisis to the fact that the men worked for too many hours, and employed very inferior tools. They placed in the hands of the Commission a very interesting document which contained not merely the reports of the working men delegates to the recent universal exhibitions, but a comparative budget of the resources and expenditure of American, Dutch, English, and French working engineers. Of the latter, there are about 20,000 in Paris. To remedy present grievances, they suggest that the Government should advance a sum of 240,000l. so as to create a co-operative

society for the manufacture of locomotives, &c. These were, for the most part, made abroad, to the great detriment of the national industry; and the workmen, if assisted to form a co-operative society, would undertake to provide steam engines at 3 per cent. below the price for which they could be obtained from England, Germany, or Austria. These are the proposals made by the delegates:—

1. Reduction of the day's work to ten hours.
2. Creation of co-operative productive societies.
3. Freedom of association and coalition.
4. Creation of a labour statistical bureau.
5. Modification of the customs tariff.
6. Reform of taxation and establishment of an income-tax.
7. Reduction of cost of transport by rail.
8. Improvement of means of communication, such as railways, canals, and bridges.
9. Extension of commercial relations with the colonies and foreign countries.
10. Construction of a Metropolitan District Railway in Paris.

It will be seen from the above that the engineers, like so many other French working men, take a broad view of the questions at issue, and distinctly rely on co-operative production and State assistance as the best means of avoiding future difficulties between capital and labour.

TWO OLD THAMES BRIDGES.

PUTNEY AND BATTERSEA.

THE recurrence of the University boat-race reminds us that two old landmarks of both the former and present courses will shortly disappear. The first race over the Putney and Mortlake course took place in 1845. The sister Universities had met on the Thames, near London, five times previously to that year, rowing from Westminster to Putney, and passing underneath Battersea and Putney bridges.*

These bridges have many points in common. They both date from the last century; both are constructed of wood; each bridge joins two ancient parishes, all four of which are distinguished alike by the towers of their churches close to the waterside. At Chelsea, a seat of the bishops of Winchester, and home of Sir Thomas More, we look across the river to Battersea, the retreat of Henry, Viscount Bolingbroke, Pope's beloved St. John. From Putney, the birthplace of Thomas Cromwell, Earl of Essex, we view the Fulham Meadows, on the northern shore, which yet remain of a manor that was appropriated to the London see long before the Conquest. Opposite to Battersea Church, and near to Hammersmith Bridge, may be traced the channels of two streams which flowed into the Thames from the uplands of Middlesex. Corresponding with these are the Wandale and Beverley Brook, whose sources lie in the nearer chalk hills of Surrey. In Battersea Fields were fought, amongst many others, two historic duels. The one between George Villiers, second Duke of Buckingham, and Francis Talbot, eleventh Earl of Shrewsbury, March 16th, 1687. It was on this occasion that the Countess of Shrewsbury,† whose husband was killed, held her lover's horse disguised as his page. The other, on the 21st of March, 1820, between the late Duke of Wellington and George, ninth Earl of Winchelsea, when neither was hit. In a plan of 1710, the fields embrace the Shoulder-of-Mutton Field and Latchmoor Mead, a waste of some 300 acres, the resort of gipsies, costermongers, prizefighters, and thieves; a part thereof, to the extent of 185 acres, together with the grounds of the Red House (bought for 10,000l.) and the Regency Tea-gardens, were reclaimed and planted by the Government in 1857-8. In the Park lie the neglected stones of the beautiful colonnade of old Burlington House, Piccadilly. Their untoward condition suggests a contrast with the happier fate which attended Inigo Jones's rustic gate, which was removed from Beaufort House, Chelsea, to the villa, now the Duke of Devonshire's, which Kent built for the Earl of Burlington at Chiswick. Over against the Red House, where it was customary to salute the contending crews with a peal of ordnance, stands a Royal Hospital that we would fain attribute to the large-

* In 1836, 1839, 1840, 1841, and 1842. Cambridge also rowed against the Leander Club over this course in 1837 and 1838. In the interval of 1838 to 1845 Oxford and Cambridge crews, though not always as representative "University eighties," had competed in the Thames and Henley Regattas.

† Anna, daughter of Robert, second Earl of Cardigan.

hearted benevolence of a royal mistress.* In the former stable-yard, now the site of Sir John Sloane's Hospital Infirmary, stood a house of Sir Robert Walpole. It had been occupied by Nell Gwynne; and close by, in Paradise-row, her compeer, the Duchess of Mazarine, gave the musical entertainments which are believed to have led to the introduction of Italian opera into England.† It were impossible to enumerate in this place one quarter of those who make Chelsea famous in London's domestic history. In Beaufort House lived Sir Bulstrode Whitelocke during the Commonwealth; Pym, member of the Long Parliament, lodged in the parish. Steele rented a house at the waterside, for which he paid 14*l.* a year. He dates a letter hence to his dear Prue, February 14th, 1716. From Sandy End Addison writes two letters, on the 20th and 27th of May, 1708, to the youthful Earl of Warwick. In Shaftesbury House, by Odell's-place (home of the author of the "Characteristics"), and which afterwards became a workshop to St. George's, Hanover-square, he composed many an article for the *Spectator*, as also Locke a portion of his Essay. On the 9th of March, 1661, Evelyn, in company "with that excellent person and philosopher, Sir Robert Murray," visited Robert Boyle at this house, "and saw diverse effects of the Eolipile for weighing air." The renowned Bess of Hardwick, builder of Chatsworth, Oldcotes, and Hardwick, county Derby, dwelt for many years in Alston House, after the death of her fourth husband, George, sixth Earl of Shrewsbury, the humane custodian of Mary Queen of Scots. Thomas Beauchamp, Earl of Warwick, a hero of Crecy and Poitiers, dates his will from Chelsea. Doctor Atterbury, when Dean of Carlisle, and Swift, were opposite neighbours in Church-street, 1711. The latter, in his *Journal to Stella*, frequently refers to his stay in what was then Church-lane. In one passage he says:—"I got here with Patrick and my portmanteau for sixpence, and pay 6*s.* a week for one silly room, with confounded coarse sheets. I lodge just over against Dr. Atterbury's house; and yet perhaps I shall not like the place the better for that." In another he speaks of the rare Chelsea unns, sold by Richard Hands in Jew's-row. Swift vacated this lodging on the 4th of July, 1711. In Church-lane, too, lived Thomas Shadwell, who succeeded Dryden as poet-laureate; and (in a house previously tenanted by Dr. Arbuthnot) his son, Sir John, Queen Anne's physician; also John Bowacke, compiler of the "Antiquities of Middlesex." To his "povvre house in Chelcieth" § More had taken Holbein as his inmate, and Erasmus, who gives us so charming a picture of the Chancellor's household. In its garden his sovereign would walk with him for the hour together, says Roper, his arm about his favourite's neck; the same garden wherein Foxe avers that More used to bind heretics to his "tree of Truth." Passing through the hands of numerous noble personages, including the great Lord Burleigh and his son Robert, the two Dukes of Buckingham of the Villiers line, and Digby, Earl of Bristol, Beaufort House was purchased by Sir Hans Sloane, who demolished it in 1740. A small piece was, however, long preserved in the southern wall of the Moravian burial-ground, Milman's-row. The house stood at the southern end of Beaufort-row, since Beaufort-street, facing Battersea Bridge. We have mentioned the bishops of Winchester. Bishop Morley removed to Chelsea from Southwark in 1663, having bought of Charles Cheyne for 4,250*l.* a house which James, Duke of Hamilton, had erected next to Henry VIII.'s old Manor-house. Winchester House appears in a map of 1836 as overlooking the Thames between Manor-street and Cheyne-row. On its destruction soon after were discovered some figure-subjects, in fresco, which Hogarth

is believed to have painted for his friend, Dr. Hoadley. Sir Hans Sloane built the new Manor-house westward of the Museum of Don Saltero, his valet, in Cheyne-walk. World's End, at the southern extremity of King's-road, subsequently Cremorne Gardens, was in high favour with the gallants of Charles II.'s day. Congreve, in "Love for Love," here places an amusing encounter between Mrs. Frail and Mrs. Foresight. In Waterman's-court lived for many years W. Lewis, bookbinder, intimate friend of Smollett, and the original of Strap in "Roderick Random." Smollett himself went to Chelsea with the vain hope of restoring his daughter's health: they occupied Monmouth House, in Lawrence-street.

Chelsea Reach, perpetuating in name the Chessel-ca, or pebble beach, of Saxon times,† has of late years inspired a certain school of painters,—amongst them Dante G. Rosetti, who lived in Cheyne-walk,—who delight in the varied effects of river mist, of glittering barges and ruddy barge-sails, of begrimed coal-flats and tug-boats. But long before it had become the fashion to describe a painted canvas as though it possessed every attribute save that of colour, or, indeed, a piece of music as if it appealed to every sense except that of hearing, the great master had seen and felt its charm. Closing his now demolished house in Queen Anne-street, Turner took lodgings at No. 119, Cheyne-walk, that he might enjoy without interruption the rising and setting of the sun over the placid surface of the river. Adopting his landlady's name he styled himself Mr. Booth, and became known to the gamins as "Admiral" or "Pugy" Booth. He built for himself the balcony on the roof of that humble little house, and there he died on the 19th of December, 1851.

Putney is a corruption of "Pwtnehitho," or "Putenhythe," denoting the existence of a landing-stage or haven. The approach thereto lay through the opening in the river-wall at the end of Brewhouse-lane. This latter name recalls the homestead of the Cromwells. Their domicile at Putney forms the text of two articles by Mr. John Phillips, which we printed some ten months ago.‡ It is, therefore, unnecessary to go over the ground again. The bridge, with its quaint toll-house covering the Middlesex end, was built in 1727-29, at a cost of 23,075*l.*, from the plans of Chesselind, the celebrated surgeon. One or two of the arches have since been widened. At Putney Cromwell fixed his headquarters in 1647, the King being then at Hampton Court. Across Putney Bridge, and by the houses of Fairfax and Ixton in High-street, William Pitt must have frequently passed on his way to or from Bowling-green House, near the Heath. That house, in which he died, lay not far from the spot where he fought G. Tierney in a duel, and where, a few years later, Lord Castlereagh wounded George Canning. Eastwards of Putney Hill stood the villa in which Edward Gibbon was born on the 27th of April, 1737. The church contains a memorial chapel, having rich tracery, to Nicholas West, bishop of Ely,—he died 1533,—whose father was a baker in the village. The river fisheries of Fulham have long yielded their fame to that of its market gardens. Its rural aspect is rapidly changing, and some effort is needful to realise what it was when inhabited by Norden or Jacob Tonson; by Mrs. Fitzherbert, at East-end House, or Mrs. Robinson ("Perdita"); by Rudolph Ackermann, at Ivy Lodge, or Francis Bartolozzi and his grand-daughter, Madame Vestris, at Cambridge Lodge. Samuel Foote lived in Hermitage Lodge, North End; at Egmont Villa Theodore Hook. We can but mention by name John, Lord Mordaunt (Viscount Aviland) and his son, the Earl of Peterborough, Samuel Richardson, and Bernard Lintot, whose homes surrounded Parson's-green. The gardens of Ravensworth House, as planted, circa 1760, by John Ord, rivalled in the interest and rarity of their collection those of the episcopal residence, upon which bishops Grindal and Compton expended so much care. The church can boast of numerous monuments, one commemorating Shak-

spere's Dr. Butts; another Dorothy, Lady Clarke (and afterwards wife to Dr. Samuel Barrow, who wrote the Latin lines to "Paradise Lost"), for which Grinling Gibbons received 300*l.* Several prelates lie buried around. He who would muse awhile on the past may profitably turn from the portraits in the bishops' library to the quaint epitaphs in the churchyard. Then pausing on the bridge, or strolling along the meadows by the river, and regardless of the new works or hideous aqueduct, he may recognise many a choice composition depicted by the vencil of De Wint.

THE NEW SCIENCE AND ART MUSEUM FOR DUBLIN.

THE *Freeman's Journal* says that on Saturday evening last the committee to whom the selection of the designs for the new Science and Art Museum and National Library was entrusted arrived at a conclusion by selecting the design bearing the motto "Crom a Bo," sent in by the firm of Messrs. Thomas N. Deane & Son, of Dublin. It will be remembered that over fifty designs were sent in for competition for the new National Museum and Library, which will be, without question, the largest public work erected in Dublin for many years, involving an outlay of over 100,000*l.* From these the committee chose five designs as being, in their opinion, on the whole, the best. Two of them were English, and the remaining three were the work of Irish architects,—viz. Messrs. Holmes & Hornblower, of Liverpool; Mr. Williams, of Bangor (North Wales); Messrs. Deane & Son, of Dublin; Miller & Symes, of Dublin; and Mr. Drew, of Dublin and Belfast. These five competitors were invited to send in detailed working drawings, so that from these the committee might be able to judge which was the most suitable, and arrive at a final selection. The drawings, which are on the scale of half an inch to a foot, arrived in Dublin within the past fortnight, and have been placed in one of the large rooms of the National University Buildings, Earlsfort-terrace, to afford the committee an opportunity of examining them. The committee consisted of Lord Powerscourt, Sir W. Gregory, Sir Robert Kane, the Lord Mayor, Colonel Noble, C.E.; Colonel Festing, R.E., of the Science and Art Department, South Kensington; and Mr. J. McCurdy, architect, with Major Parker, C.E., honorary secretary. Several meetings were held, at which all the members of the committee attended, with the exception of Sir William Gregory, who is absent in Ceylon, and the designs were compared and discussed with great care and deliberation before coming to the decision above announced.

One conspicuous merit of Messrs. Deane's design, in the opinion of the committee, is the care taken to make the new buildings harmonise with the existing edifice of Leinster House, and the due subordination of the entire design to the means at disposal,—both as to space and money,—so that while ornament is not lost sight of, utilitarian and practical considerations are steadily kept in view. The frontage in Kildare-street, extending from the College of Physicians on the north side to Kildare-place on the south, will measure nearly 600 ft. Irish materials will be employed as largely as possible in the work. The front, with its central dome and side wings, will be of Dalkey granite or some similar native material, and the more ornamental portions will be constructed of the Mount Charles stone from the county Donegal, which for its rich cream-coloured hue is preferred by many to Portland stone. Externally the design endeavours to adhere to the architectural character of Leinster House,—those parts of the new building which are nearest to it being almost identical in treatment, while the more distant portions of the structure gradually get into a style more free and in better consonance with the object of the building. The Museum, which will be situated to the right side, nearest to Stephen's-green, will be entered through a grand circular vestibule, composed of specimens of all the Irish marbles, so arranged as to set off and display their varied beauty and finish to the highest advantage. The circular vestibule will lead into a spacious central court, 112 ft. in length by 68 ft. wide, with a glass and iron dome roof, supported by iron columns, and surrounded by a gallery 10 ft. in width. Around this court are rooms and galleries of various sizes, there being a large

* With this compare Greenwich Hospital, on the same river, and designed by the same architect, —Wren,—founded by William III. in memory of his cherished consort, whose pity had been kindled on witnessing the sufferings of the victors at Cape La Hogue.

† Nell Gwynne also resided at Sandford Manor House, where are the gas and coke works, by Crompton's Creek. ‡ At the western end of Cheyne-walk. Failing the line of Sir Jos. Acland, whom Charles II. created a baronet, it became the porcelain works in which Dr. Johnson experienced the treatment of the Rev. Dr. H. & Co.'s stained paper factory. It was pulled down in 1813.

§ See his letter to the king, on his hearing of his downfall, Cottonian MSS.: Cleop. E. 6, fo. 185. ¶ So called in later years from a quondam owner, Henry, third Marquis of Worcester, created Duke of Beaufort, December 2nd, 1682.

* Converted at the Restoration from a pathway through the fields into the king's coach-road to Hampton Court. Opened to the public in 1718, on the petition of Sloane, lord of the manor, and other freeholders. King Charles II. built the so-called Bloody Bridge for this road across the West-bourne (at Sloane-square).

† Conf. Selsey (Chelsey), co. Sussex; the Chissels, at the Aze's mouth, in Devonshire; the Chessil bank uniting Portland with the mainland.

‡ See *Builder*, vol. xiv., pp. 621, 697.

gallery at each end 100 ft. by 38 ft., both on the ground and upper floors. Opposite the entrance, and having crossed the central court, the grand staircase will be reached, from which access will be had to all the upper portions of the building. The staircase will form a conspicuous feature of the design.

On the side of the Leinster House, but communicating with a covered-way, will be the buildings devoted to the library and reading-rooms. The principal reading-room, of a semi-elliptical shape, will be 65 ft. long by 60 ft. in width, and calculated to accommodate over a hundred readers. At each side of the large room will be two smaller or students' reading-rooms; and separated from them by a corridor will be the librarian's apartments and the ladies' reading-room. At either side of these will be the spacious apartments forming the library proper, or, as they are called on the plans, the "book stores," the shelves of which will provide for 800,000 volumes.

The plans also comprise a new lecture theatre, more spacious and commodious than the present one, and which will be placed on the north side to the left of Leinster House, on the site of the present School of Art, and new rooms for art students, who will be transferred to the south side of the building.

The total area afforded in the new buildings will be over 78,000 square feet, and the entire estimated cost is 109,700*l.*, of which the Museum and Art School will be 73,500*l.*, and the library 36,208*l.* It may be mentioned that the floors will be fireproof, composed of iron and concrete. It is hoped that, now that the committee have selected the plans, the sanction of the Treasury and other Government departments will be obtained without delay to the advertisements for tenders from contractors, so that the work may be commenced during the summer.

We understand that the drawings will be exhibited in the course of a few days.

FURTHER NOTES AS TO THE HOUSING OF THE POOR.

The problem to be solved is to provide good wholesome dwelling-places for the poor, at a rental within their means of paying, and at a cost which will leave the landlords a fair return for their outlay. These dwellings must be, in the majority of instances, within easy distance of the places where the men work, and therefore in districts where the ground-rents are high, and the cost of erection of course increased by that amount. Notwithstanding the experience gained in the past, and the examples of Edinburgh and Paris, we cannot say that the architects employed have risen to the occasion, for if they have secured the maximum of comfort, they have not attained the maximum of beauty in the structures. The most ardent well-wisher of the houseless poor would not desire that palaces should be built for their accommodation, but they might be a little less suggestive of a gaol or a workhouse than many of them are, without adding materially to the expense.

It is also a matter of doubt if there should be too much of the philanthropic element visible in their management. All the supply stores, if these stores are established, should be under the management of the tenants, but tenants of this class are itinerant dealers in many instances themselves, and rather scorn "stores." If the new houses are to be simply a commercial undertaking, the poor should look after their own amusements, even if a news-room were provided in addition to bath-rooms, wash-houses, a public kitchen, and bakery. These are indispensable for the sake of economy and comfort. The great drawback to many of the piles of dwellings at present erected is the public staircase. It is too frequently dirty, and is the resort of children and the meeting-place of the young of both sexes. You may avoid disagreeable characters in a street, even if you only inhabit one room; but you can hardly avoid contact with them on a staircase to which they have an equal right to yourself. Numerous stairs are a necessity in order to provide ventilation, and the means of easy exit and entrance in case of fire. It is this necessity that has prevented, to a great extent, the chambers being ranged in galleries like the "rows" at Chester, independent of each other, and each floor having its own special stair. This arrangement would give an architectural

character to the court, in the fashion of the old inn yards.

In the interior fittings of these dwelling-places much could be done to improve their comfort, and lessen the cost of living, if only wives and daughters in charge would take an interest in the tidiness and cleanliness of their homes. But a woman who has not sufficient self-respect to wash herself or her children is hardly likely to care what appliances are provided for her in the rooms in which she dwells. Grates that burn but little coal and yet give out sufficient heat and afford the means of cooking something else besides potatoes or boiling the tea-kettle would not be appreciated by her, but they would by many. In some of the new dwellings we have seen the indispensable fittings of a sitting-room made fixtures in a double sense, for they are strong enough to bear ill-usage, and belong to the landlord.

It is, however, in the bedrooms where there is the greatest opening for improvement. There is, amongst the very poor, a disposition to make their beds on the floor. If they have one or two bedsteads and the family is at all numerous, many of the beds are made up on the floor regardless of draughts, dirt, or other inconveniences. If bed-places were built in tiers and in recesses and lined with glazed bricks they could be hidden by a piece of drapery during the day, and be conducive to decency and morality at night. The question of eking out the scanty furniture of the poor by these structural contrivances is eminently worthy of consideration.

The question of sinks and closets, and the disposal of ashes and waste, is a very important one, as well as the supply of water. The latter is not more important than the disposal of dust, ashes, and refuse matter. In the better class of houses built in flats, arrangements have been made to sweep these into a shoot, and let them fall into a common receptacle; but this plan is objectionable on sanitary grounds, as well as being likely to become a nuisance from the clogging of ashes and dust on the sides. The metal bucket or box, which can be removed day by day, is the best, the liquid slops being discharged down the drains.

There are many minor arrangements which could be introduced at little or no expense, if provided for in the first instance; but no thought, no wise arrangement of health officer or architect, will avail if the people will not care for their homes. Out of thousands who represent "Outcast London," there are many who would gladly exchange squalor for comfort and cleanliness, but, on the other hand, we must not shut our eyes to the fact that the great majority have been born with these surroundings, or have, by their own acts, abandoned home comforts from sheer love of drink, of vice, and filth. They like to herd with the swine. They have not an ambitious thought beyond the next day's drink and victuals, for which they care not if they beg or steal. Water to them is unnecessary and abhorrent. They care not for what the world calls decency, and have to be dragged into sending their children to school. There is no "bitter cry," and they care not if "London waits" till Domesday for the cleansing of the Augean stable. They will "move on" when the policeman orders them, but to "move upward" is not in their nature. To place these in the improved dwellings of the future is simply to turn them into whitened sepulchres, fair without, but loathsome within. The ever-growing, ever-increasing population of London and our great manufacturing centres must, however, be provided for. The highest results of scientific investigation must be applied in the simplest manner, and, if we cannot reclaim to habits of decency those who have so hopelessly fallen, we can at least prevent others from falling into the social slough of despond.

LONDON AND COUNTY BANK, KING'S CROSS.

THE illustration in our present issue shows a new branch building which has recently been opened by the London and County Banking Company, opposite to the Metropolitan Railway Station in the Pentonville-road, King's-cross. It has a frontage of 30 ft., is faced with Portland stone all up, and is finished with simply treated Classic detail, attention having been paid to the necessity for ample window-space. The premises comprise a roomy bank, with manager's and waiting rooms, &c., on the ground-floor;

two strong-rooms and storage space in the basement, and thoroughly good house accommodation for a manager or head-clerk on the upper floors. The whole, including fittings and lift, has been carried out, at a cost of about 5,000*l.*, by Messrs. T. Rider & Son, under the superintendence of Messrs. Glover & Salter, who, it will be remembered, are among the architects selected in the first War Office competition.

SEDILLA, WYMONDHAM.

THIS interesting piece of Renaissance work stands in the easternmost arch on the south side of the Norman arcade of Wymondham Church. It is executed in terra-cotta, presumably of Italian workmanship, and is in a good state of preservation, except that the ornamentation is a good deal blunted and choked by repeated coats of whitewash. The tone of the terra-cotta itself is a warm buff. The illustration is taken from a measured drawing by Mr. Walter L. Spiers.

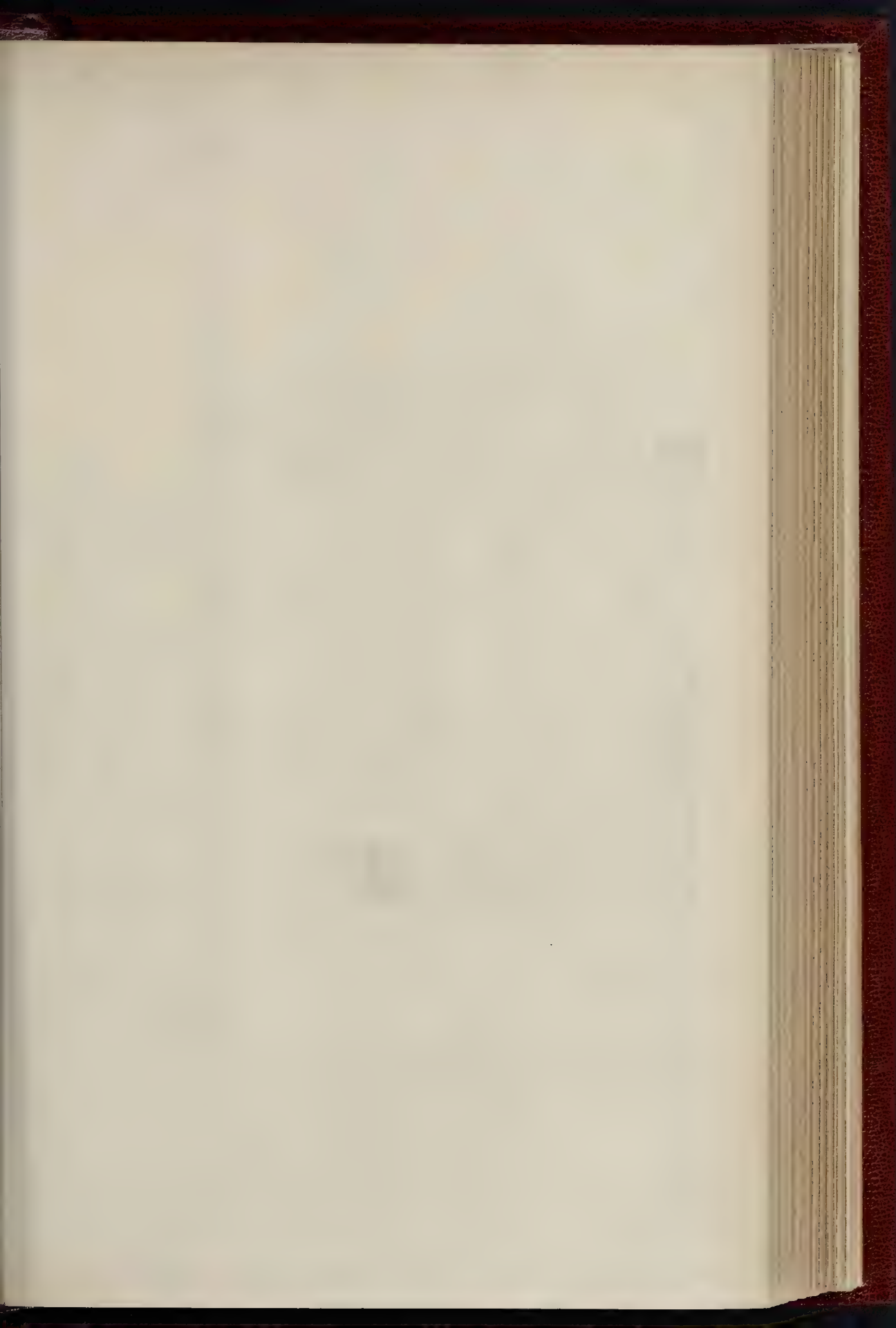
WADHURST PARK, SUSSEX.

THIS country seat, part of which has been already illustrated in this journal (vol. xxv., p. 504), has been recently extended, and now measures 360 ft. from the west wall of the chapel to the east wall of the library. The nucleus of the group consisted,—when the present owner, Mr. C. de Murieta, took the property,—of most of that portion which lies at an angle to the rest. That portion was already an accumulation of successive dates of building; the rooms now used as butler's pantry and butler's bedroom are panelled from floor to ceiling, and have been illustrated in the Architectural Association Sketch-book (vol. iv., pl. 38). This panelling, the deep chimney-corner, and the fire-dogs,—cast from the local iron contained in the "Wadhurst clay,"—appear to date from the early part of the seventeenth century. The outer wall over the lamp-room has a circular stone bearing the inscription, "B. J. M., 1797," and probably includes the part now called cook's room, back hall, and the floors over the whole of the part hitherto mentioned. The kitchen, scullery, and larder (which have been recently rebuilt on the same foundations) were probably part of the same work. Then a front was added to the house, consisting of a modern dining-room (now the servants' hall), drawing-room (now brushing-room), and staircase, and the whole thus brought to a square outline was roofed in with a lead flat and a cupola, surrounded by a slate slope and a pediment over the centre. In this condition it was as hideous as could be conceived, and deterred several people from taking the fine estate on which it stood. The present owner, however, saw that it would answer his purpose as a temporary residence, to which a more suitable one could be attached, and he commenced operations, in a characteristic manner, by building the long range of stables for summering hunters, which are shown on the upper left-hand corner of the view. He next proceeded, as a good landlord, to build new farmsteads on the estate, one called "The Coombe," and the other "Flatenden." In October, 1872, the foundations of the new mansion were begun. The central hall contains the cross axes of the entire house, as will be found by examining the position of the main doors and windows. Looking westwards the chapel is seen. This had already been begun. It is lined with Garrard's tiles, which are reproduced from old Spanish ones. The present western portion of this central hall was the dining-room, but, being found too small for a house which receives such distinguished guests as the Prince of Wales, it was determined to build a larger one. A new wing was, therefore, started in 1881. It had to be contrived so as to be approached without passing through the old house, which is now devoted to the servants. The north-west wing was also added, increasing the office accommodation and containing two floors of bed-rooms. At the same time the conservatory was built, and thus the approach to the chapel, under cover, is completed.

The fountain shown on the view is not in existence, but the water is laid on to it, as to the rest of the house, from a reservoir at a sufficient altitude to protect any part of it from fire.

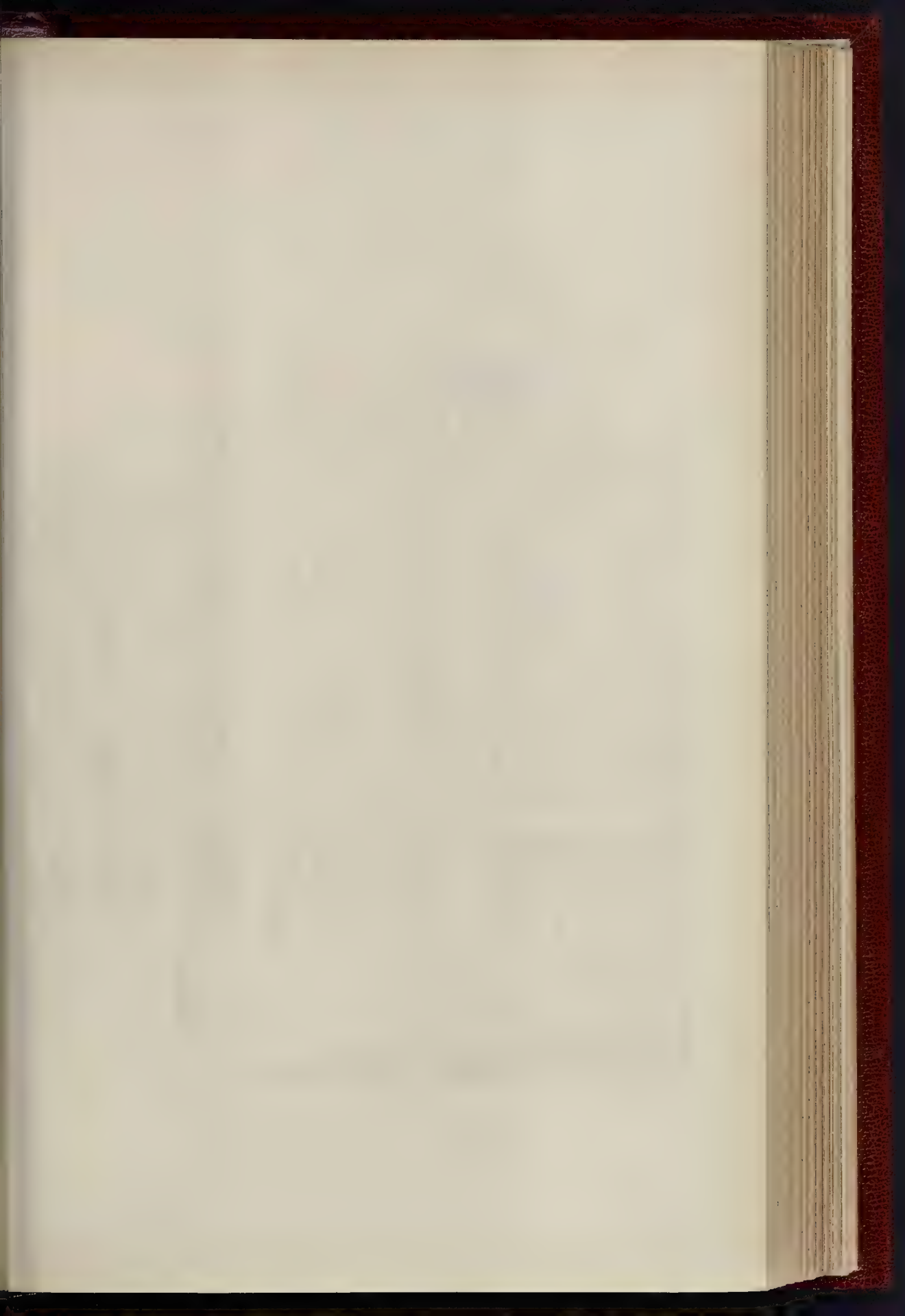
Building has been in hand, under the charge of the writer, almost constantly since 1869; and, while these lines are being sent to press, fresh details are being sent to work from.

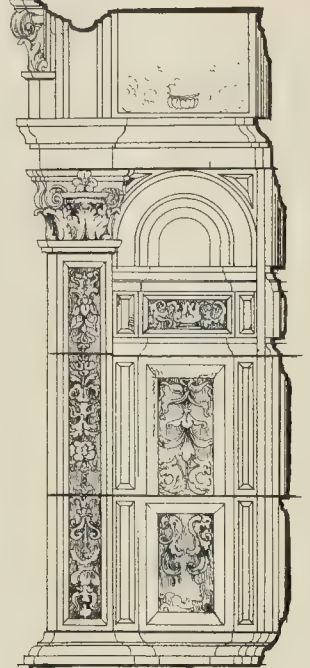
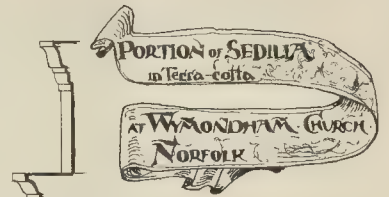
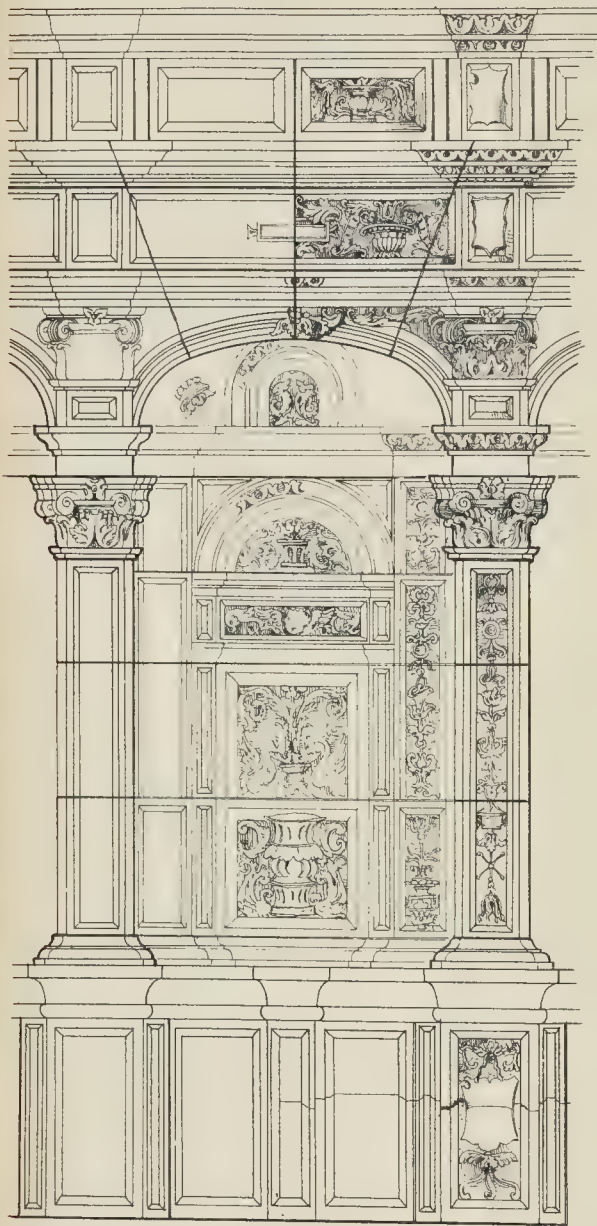
E. J. TARVER.





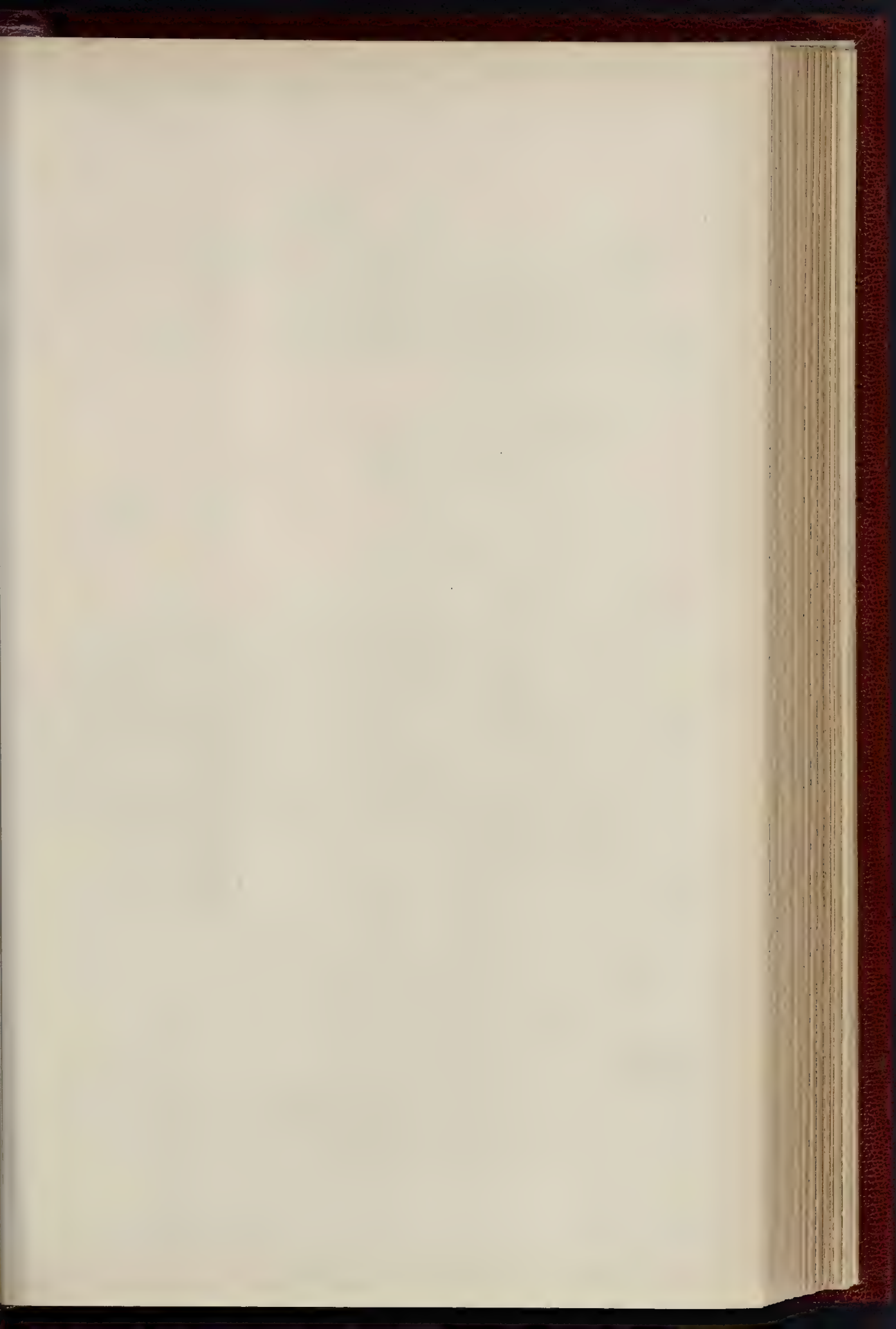
LONDON & COUNTY BANK.
PENTONVILLE ROAD, KING'S CROSS, N.
GLOVER & SALTER ARCHT^S
A.D. 1883.





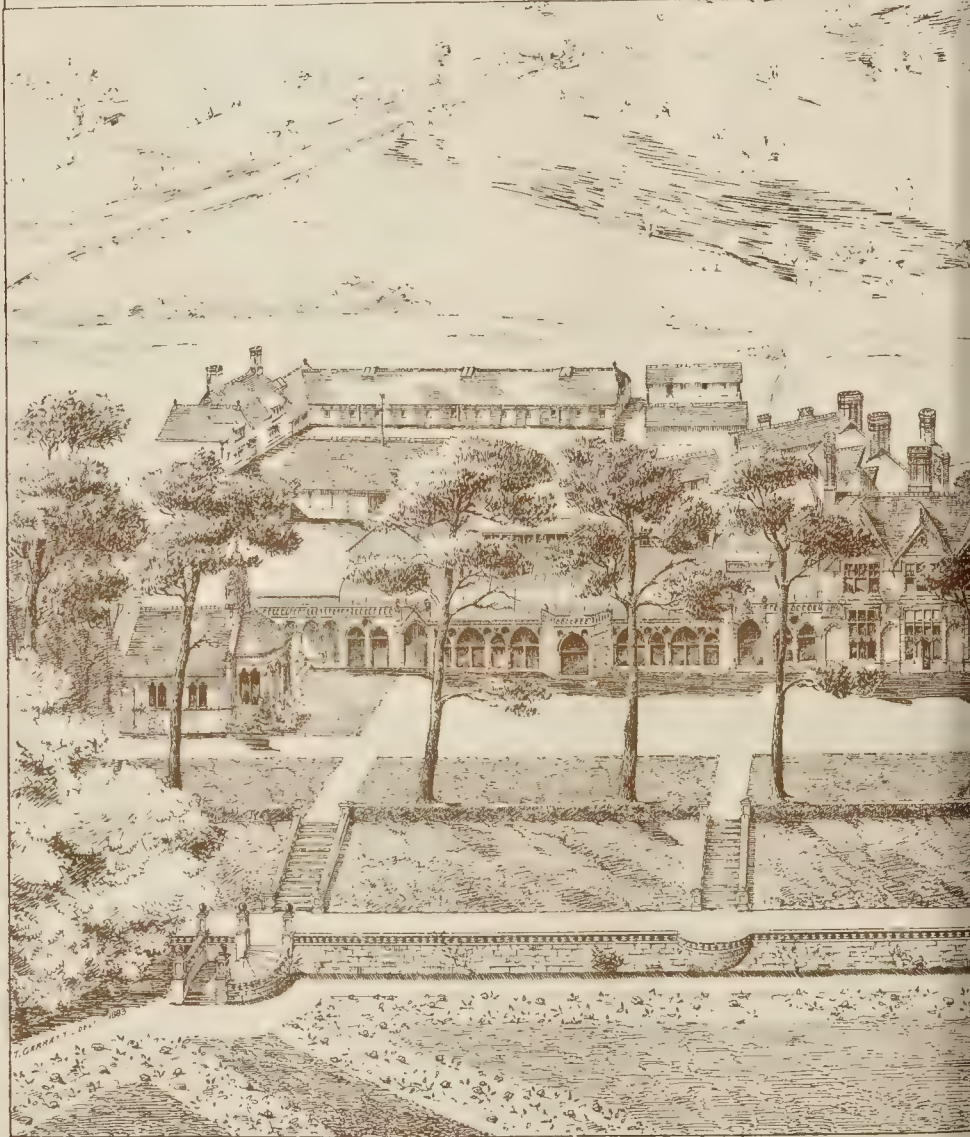
From a drawing
by *M. W. L. Spence*
A.B. del.

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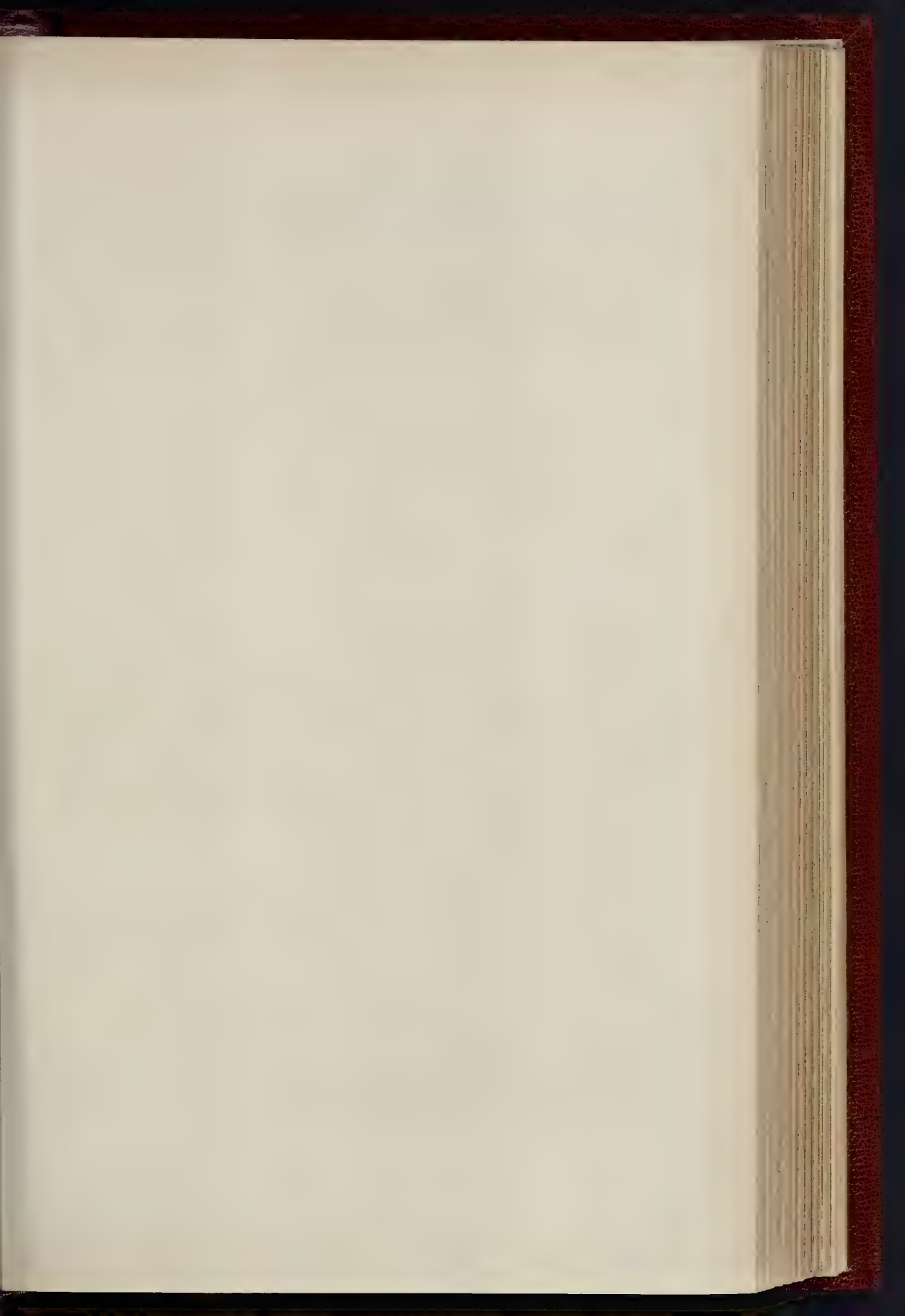
WADHURST

THE SEAT OF C.



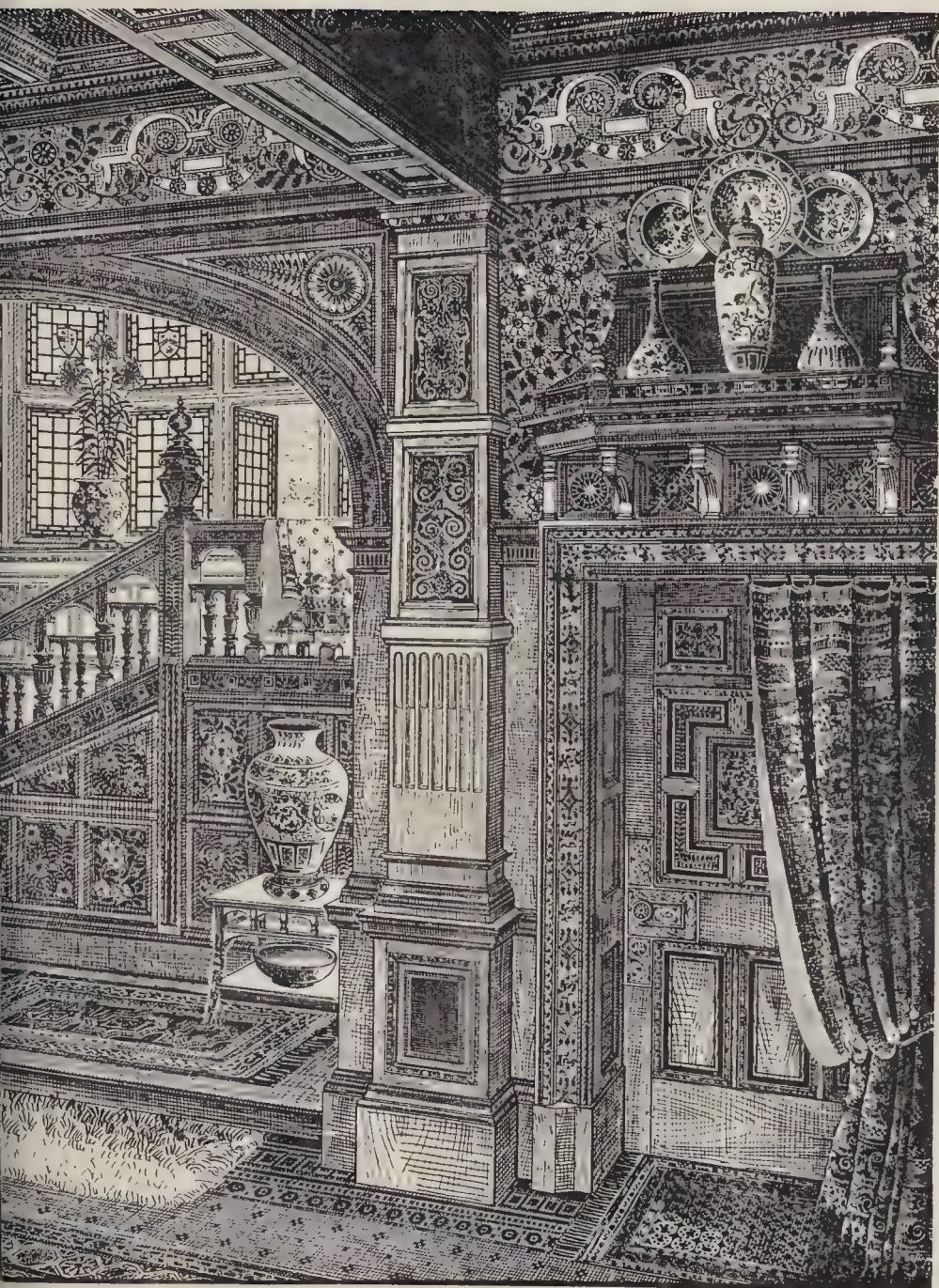
W. G. GARRATT - DEL. 1887
W. H. HARRIS & SONS - PHOTO LITH. 656 High Holborn



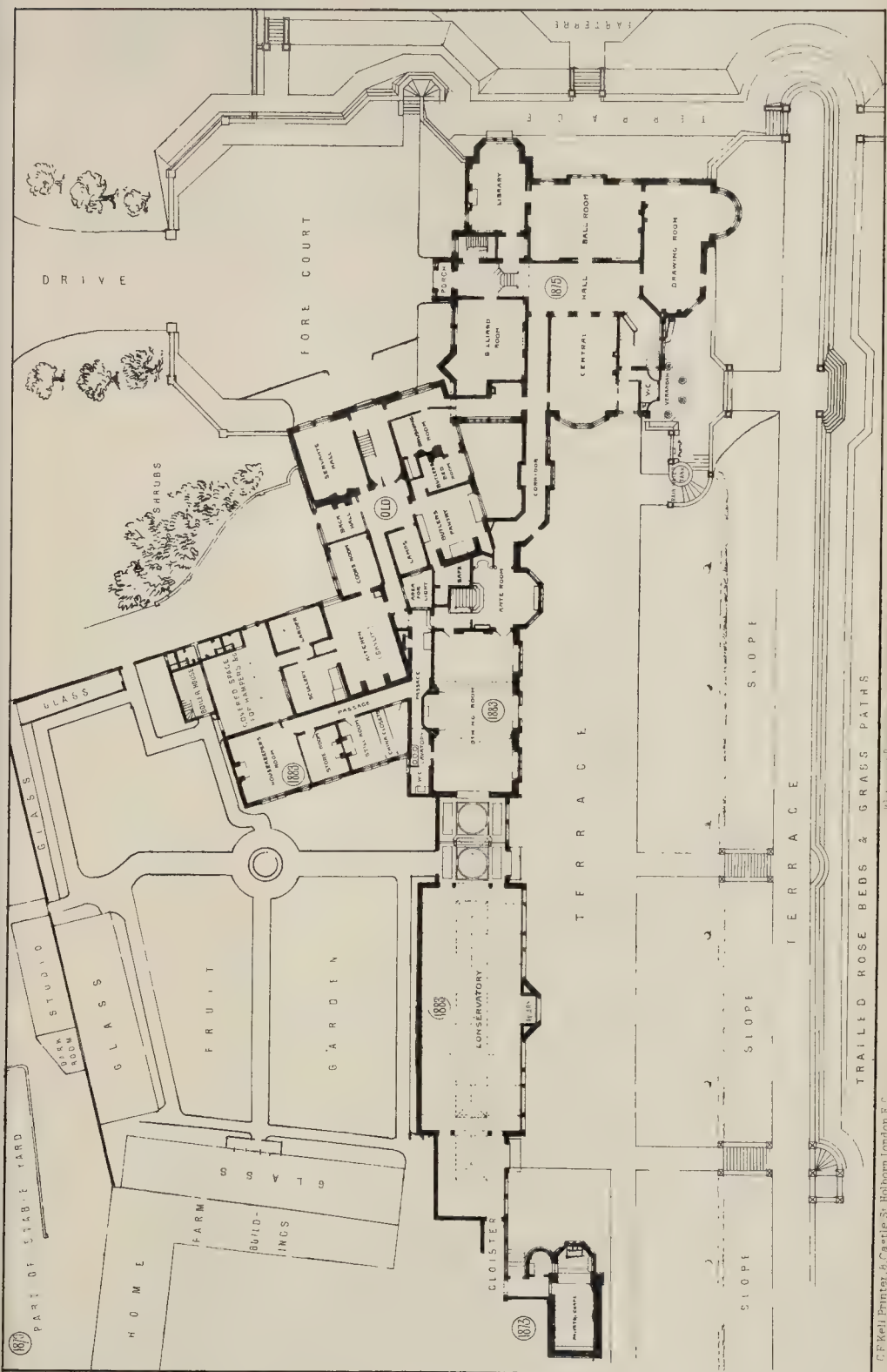




DESIGN FOR INTERIOR DECORATION: HALL AND



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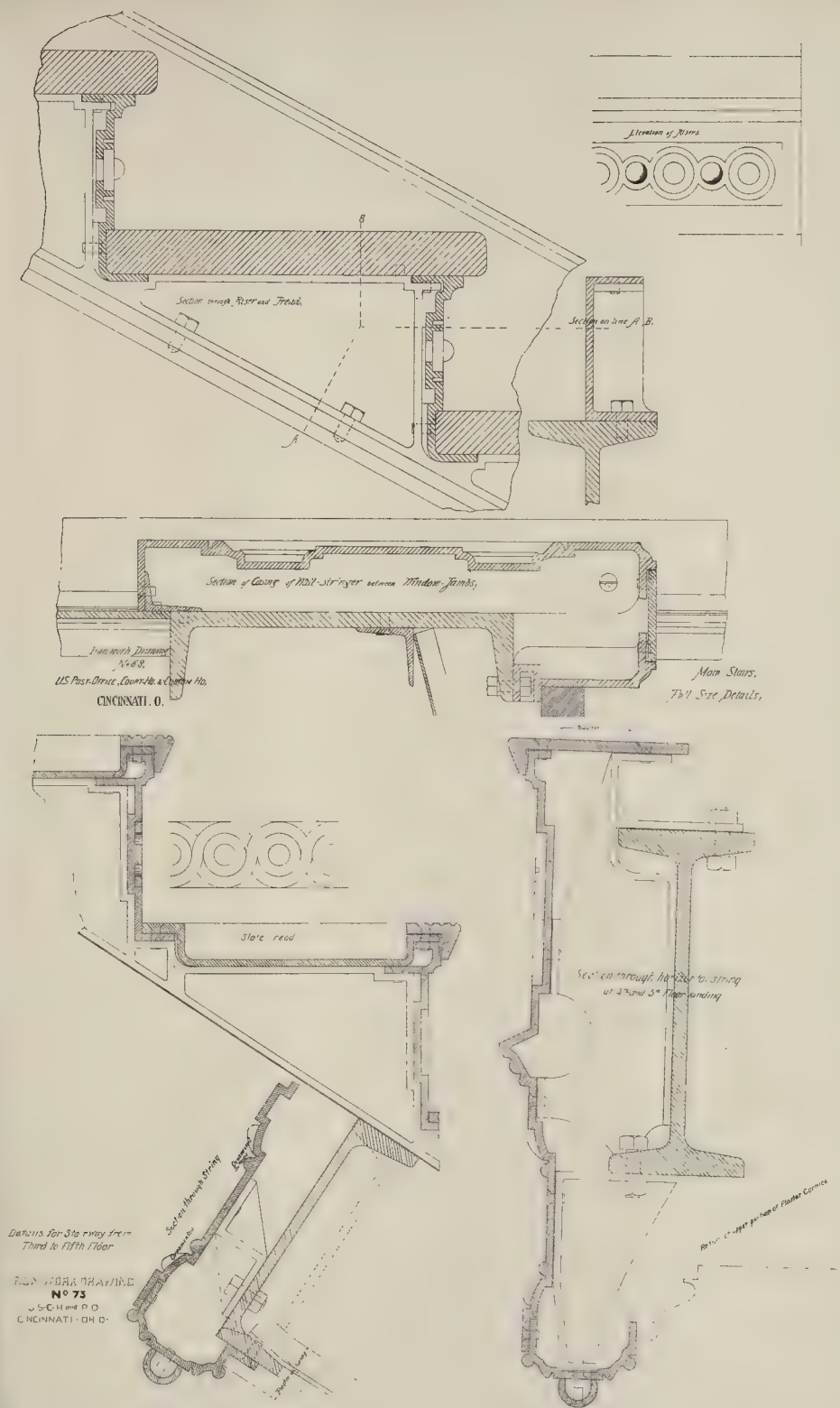


M. E. J. TARTER Architect

WADHURST PARK, SUSSEX.

TRAILED ROSE BEDS & GRASS PATHS

G. F. Kell Painter, 4, Castle St., Holborn London, E.C.



HALL AND STAIRCASE DECORATION.

We give this week an original design for interior decoration, which was exhibited in the Royal Academy last year. Mr. E. W. Poley is the author. The design speaks for itself.

DETAILS OF AMERICAN CONSTRUCTION.

In the paper by Mr. Gale to which all these detail drawings which we have published have reference, it was observed that the fireproof stairs of iron and other materials are constructed in the States with a good many varieties of detail. The present drawing shows to a large scale the details of two such stairs.

ARCHITECTURAL ASSOCIATION.

VISIT TO THE NEW CONGREGATIONAL CHURCH, HAMSTEAD.

On Saturday last the members of the Architectural Association made an excursion to Hampstead, this being the sixth afternoon visit in session, and the building selected was the new Congregational Church, now in course of erection in Rosslyn-grove. Upon the history and recent changes in this very interesting church of London it will be unnecessary now dilate, as we have so recently expatiated upon the subject in a leading article in the *Builder*, May 12th, 1883. The new Congregational Church is being erected from designs and under the superintendence of Mr. Alfred Waterhouse, R.A., architect, and is situated at the intersection of several thoroughfares, opposite the ancient district church of St. Stephen, which was erected from the designs of Mr. S. S. Union, architect, in 1872, and the interior of which many members of the Association inspected on Saturday.

The west or principal elevation of the Congregational Church faces Lyndhurst-road, and its chief features are a bold three-light window and two entrance porches. Inside one of these arches is the foundation-stone, on which is inscribed these words:—"This stone was laid by the veteran missionary, Robert Moffat, July 4th, 1835." The church is a fine example of the style of the 19th century, and the building was completed in 1883. The church is a fine example of the style of the 19th century, and the building was completed in 1883.

The plan of the church is hexagonal, having a clear span of 68 feet. There are galleries round three sides of the hexagon. The ground-floor and galleries will accommodate 200 persons. The contractors are Messrs. Parnell & Son, of Rugby, and the amount of contract is 14,000*l.*, but it is estimated the building and offices will cost about 17,000*l.* On completion. On the first-floor, at the east end, on a level with the galleries, is a spacious lecture-hall, and beneath this, and behind the communion-table, are the ministers' vestry, the commons' vestry, and four class-rooms. The east end contains the heating apparatus, coal fire, and still-room. The ground-floor and galleries will be paved with wooden blocks. The church is erected and faced with Luton bricks and terra-cotta dressings externally, all in white mortar. Internally the church is clad with patent tinted bricks, by Messrs. Ham & Sons, of Wortley, Leeds; these are in coloured bands, and have a most striking effect. We understand these bricks (which are not glazed) are here introduced into the building by the architect for the first time. We understood the cost of them to be about four thousand. All the roofs are covered with Edwards's tiles, from Ruabon, Wales; and are met at a centre over the hexagon, and are surmounted by a lofty lantern. The windows are glazed with cathedral-tinted glass, by Mr. Ward and Mr. Brewster, both of London. Seats, joinery, and fittings are all of pitch pine, varnished. The ornamental ironwork, gas-pipes, and pendants have been executed and supplied by Messrs. Hart, Son, & Peard, and the structural ironwork by Messrs. Lindsay, of 11 Wharf, Paddington. The chief characteristic of the church is the extreme simplicity of its materials; and owing to the plain shape and limited area of the site, we admit that the architect has availed himself of every foot, we were almost going to say every inch of space, at his command.

THE ANTIQUITIES OF WISBY.

The history of this town in Gothland has recently been treated by Dr. Theodore Gaedert, of Lübeck, who records the fact that it was at one time the Venice of the Baltic. Old chronicles speak of golden windows and copper doors, and the extent of the town may be estimated from the fact that there now exist ruins of eleven churches. There were at one time eighteen, and the fortifications of the place were of great strength. The town suffered considerably from an attack made by the Danish King Waldemar IV., in 1361, from which time its prosperity declined. The churches were mostly built from the twelfth to the fifteenth century, and consequently the Romanesque Transition and Gothic styles are represented in their architecture.

THE SCHAUSPIELHAUS AT BERLIN.

The *Berliner Post* states that the facing with sandstone of the façades of the above theatre is making satisfactory progress under the direction of Herr Hense, Court Architect. A year will still elapse before the whole work is completed. It is being carried out with yellow sandstone from the Rackwitz quarries in Silesia, and will be worthy of the original structure, the monumental effect of which it is intended to complete. Portions of the building had originally been of sandstone. The journal alluded to remarks that the application of paint of sandstone colour to one portion of the building is undesirable, and maintains that, however commendable are the motives which have prompted the work now being executed, there is a much more extensive restoration necessary to do justice to Schinkel's work. This artist is said to have in his later years approved the theory of polychromatic decoration as having been practised by the Greeks, and it is suggested that portions of the interior should be treated in accordance with this principle of ornamentation.

THE NEW WEST DOORWAY OF ST. GILES'S CATHEDRAL.

The following description of the sculpture in this doorway is given in a recent number of the *Scotsman*.—"The new west doorway of St. Giles's Cathedral has just been completed by the placing, in the niches above the arch, of a series of statues representing famous Scottish kings, queens, and ecclesiastics, some of whose names are more or less intimately associated with the ancient pile. There are twelve statues in all, including six kings, two queens, and four churchmen; the royal personages occupying the six whole and two half upper niches, while the four lower ones are appropriated to the divines. Taking first the sovereigns, and beginning at the left hand of the upper line of niches, we have them in the following order:—(1.) Alexander I., who erected, on the site of the present cathedral, the first church in Edinburgh certainly known to have been dedicated to St. Giles. He appears clad in mail, and wearing the conical helmet, with 'nasal,' peculiar to the period. (2.) David I. is arrayed in graceful kingly attire, and holds a sceptre in his right hand and a book in his left. This monarch is understood to have materially forwarded the endowment and decoration of St. Giles's. (3.) Alexander III. stands resting on a sword which is held by both hands, the countenance exhibiting the sternness and determination which characterised the hero of the battle of Largs. (4 and 5.) Figures of Queen Margaret, and Margaret, the consort of James IV., are disposed in the two half niches. (6.) Robert I. the Bruce is represented in the plate armour which began to be worn during the reign of the Conqueror of Bannockburn; the right hand rests on the Bruce's favourite weapon, the battle-axe, while the left, holding a sceptre, is supported by a shield. (7.) James I., the poet-king, appears in the ermine of royalty, with a scroll held to the breast, and a happily-caught attitude of pensive meditation, suggestive of the author of 'The King's Quhair.' (8.) James IV. displaying a banner held in the left hand, is encased in the seemingly impenetrable armour of the period. Passing to the ecclesiastics, in the lower row of niches, and commencing as before at the left, there are to be noted:—(1.) Gavin Douglas, the second Provost of St. Giles; a massively

disposed figure, effectively draped, standing in thoughtful attitude, and holding in his crossed hands the pencil and paper indicative of poetic pursuits. (2.) John Knox, in the well-known Venetian gown, with beard hanging down on the chest, and hands demonstratively exhibiting an open Bible. (3.) William Forbes, the first Episcopal Bishop of Edinburgh, in the attitude of benediction, supported by a crozier held in the left hand, and wearing the mitre and appropriate vestments. (4.) Alexander Henderson, a champion of Presbyterianism against Prelacy, shown in loose-flowing robe, surmounted by a ruff encircling the neck, and holding a slightly-opened Bible in the right hand, as if in the act of argumentation. The whole work in connexion with the doorway, with its elaborately-enriched mouldings and gracefully-foliated caps, its large panel in which is sculptured 'Sanct Geill and his Hynde,' its smaller panels containing the four Evangelists, and the niches and statues above described, forms a notable addition to the architectural features in the city. The admirable design, by Messrs. Hay & Henderson, architects, has been executed by Mr. John Rhind, sculptor, in a style worthy of his well-earned reputation."

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting on Tuesday, the 1st of April, Sir J. W. Bazalgette, C.B., president, in the chair, it was announced that the Council had recently transferred Joseph Bernays, George Cartwright, Charles Colson, William Irlam Ellis, Alan Grant-Dalton, James Charles Inglis, and Arthur Shanks, to the class of *Members*; and had admitted James Hartley Abbott, Henry Matthew John Bacon, John James Bourne Benson, Henry John Bridgewater, Herbert Alexander Caffin, Arthur Pitt Chambers Cary, John Jacob Cohen, Alfred Fawcus, John Jervis Garrard, Albert Daniel Greatorex, Bertram Jones, Cyril Edward Arengo Jones, Hugh Torrance Ker, James Percy Knight, Hubert Bindon Marten, and William Pollock, as *Students* of the Institution. At the monthly ballot, Frederick Beesley, Westminster; Jorge Rademaker, Grinewald, Dun Pedro II. Railway; Clayton Turner Mason, F.W.D., Western Australia; and John Taylor, Queen-street-place, were elected *Members*; José Barbalho Uchôa Cavalcanti, Rio-de-Janeiro; John Henry Clomes, Falmouth; Charles Edward Goodfellow, Adelphi; Francis William Gosling, Staines; Archibald Greenlees, P.W.D., India; Frank Gotto, Westminster; Henry Charles Kirke, Millwall; John Edmund Phipps Lincké, P.W.D., India; Francis Roan Mahony, Cork; Charles Leslie Stewart Mais, A.K.C., Stud. Inst. C.E., Jamaica; Henry Waterworth Parkinson, Lanc. and Yorks. Ry.; George Rankin, Stud. Inst. C.E., Cape Govt. Railways; Thomas Hearn Rawson, P.W.D., N.Z.; Martin Penn Roberts, Post-Office Telegraphs; Henriette Scheid, Rio-de-Janeiro; William Achson Trail, Electric Tramway, Portrush; and William Whittington, Neath, *Associate Members*; and Tolmie John Tressider, Capt., R.E., an *Associate*.

EDINBURGH

ARCHITECTURAL ASSOCIATION.

On the 22nd ult. a large party of members visited Prestonfield House, Craigmillar Castle, and Peffermill, under the guidance of Mr. Thomas Ross. At a meeting held on the 3rd inst., Mr. David MacGibbon, the president, in the chair, a paper on "Colour," by Mr. W. Scott Morton, was read. The author remarked that for some time the general tendency in our country had been to colour on a low scale, and this, he thought, was a good sign, as it evinced a desire for harmony, and the avoidance of the garish colours which recently were so familiar to us. At the same time, this low scale indicated timidity, and it was much to be wished that, with an advancing art education, decorators would give us pleasing colour on a higher pitch. Instead of the very cold and thin colours which were commonly used, some bloom and fulness of tone might be used; they would cost no more, and the artistic effect would be enhanced. These Northern regions were, of course, unfavourable to the development of the colour sense, and the lecturer illustrated this by pointing to the results of the outstanding glory of Italy, its sunsets. We can never have in this country any such highly-coloured pictures as Venice presents; but, he added, let us be thankful for the lovely tints of the morning and evening sky, the rainbow, the rich adornment of flowers, the varied plumage of birds, the blue and purple mountains, and the soft verdure of trees, valleys, and hills; and let those who had to spend most of their days in our cities keep their eyes open to the fine pictures to be seen in dull and foggy weather, when we get massive and picturesque groups in various hues of cold or brownish grey, against a sky through which the sun is struggling to penetrate, giving us the complementary hues of warm grey, yellow, and

orange. After all, we have the grey hue generally present with us, and more particularly in our cities. When the eye is filled with grey in walks abroad, it sought refreshment indoors in its complementary; and hence varied hues of yellow could be satisfactorily used in large masses in our interiors, and when other colours were required on large surfaces for variety, they ought to partake to some extent of a warm or yellowish hue. One great difficulty in the way of advancement in house decoration was the want of technical education among the working painters. It was often found that the finished result of their work was disappointing, owing to the lack of skill in handling properly the various stages of their work, so as to give the bloom required on its completion.

INTERNATIONAL HEALTH EXHIBITION.

The following handbooks to the Exhibition are in course of preparation:—

"Healthy Villages." Illustrated. H. W. Acland, C.B., M.D., F.R.S.
 "Healthy Bedrooms and Nurseries, including the Lying-in-room." Mrs. Gladstone.
 "Healthy and Unhealthy Houses in Town and Country." Illustrated. Mr. W. Eassie, C.E., with an Appendix by Mr. Rogers Field, C.E.
 "Healthy Furniture and Decoration." Illustrated. Mr. R. W. Edis, F.S.A.
 "Healthy Schools." Mr. Charles Paget, M.R.C.S.
 "Health in Workshops." Mr. J. B. Lakeman.
 "Manual of Heating, Lighting, and Ventilation." Illustrated. Captain Douglas Galton, C.B., F.R.S.
 "Food." Mr. A. W. Blyth, M.R.C.S.
 "Principles of Cookery." Mr. Septimus Berdmore.
 "Food and Cookery for Infants and Invalids." Miss Wood; with a Preface by R. B. O'Connell, M.D., F.R.C.P.
 "Drinks, Alcoholic." John L. W. Thudichum, M.D., F.R.C.P.
 "Drinks, Non-Alcoholic and Aërated." John Atfield, Ph.D., F.R.S.
 "Fruits of all Countries." Illustrated. Mr. W. T. Threlton Dyer, M.A., C.M.G.
 "Condiments, including Salt." Rev. J. J. Manley, M.A.
 "Legal Obligations in respect to Dwellings of the Poor." Mr. Harry Duff, M.A., Barrister-at-Law; with a Preface by Mr. Arthur Cohen, Q.C., M.P.
 "Moral Obligations of the Householder, including the Sanitary Care of his House." G. V. Poore, M.D., F.R.C.P.
 "Laboratory Guide to Public Health Investigation." Illustrated. W. W. Cheyne, F.R.C.S.; and W. H. Corfield, M.D., F.R.C.P., M.A.
 "Physiology of Digestion and the Digestive Organs." Professor Arthur Gamgee, F.R.S.
 "Fermentation." Dr. Duclaux; with a Preface by M. Louis Pasteur, Membre de l'Institut.
 "Spread of Infection." Mr. Shirley F. Murphy.
 "Fires and Fire Brigades." Illustrated. Captain Eyre M. Shaw, C.B.
 "Scavenging and other such Work in Large Cities." Mr. Booth Scott.
 "Athletics." Part I. Illustrated. Rev. E. Warre, M.A.
 "Athletics." Part II. Hon. E. Lyttleton, M.A., and Mr. Gerard F. Cobb, M.A.
 "Dress in relation to Health and Climate." Illustrated. Mr. E. W. Godwin, F.S.A.
 "The Ambulance." Illustrated. Surgeon-Major Ewart, M.D., A.M.D.
 "The Influence of Schools of Art on Manufacturing Industry." John Sparkes.
 "The Homes of the Poor." Author not yet settled.

PROPOSED HEALTH CONFERENCE.

DEAR SIR,—No doubt the proposed health conference will be the means of eliciting an enormous mass of all kinds of information and suggestion in regard to health. Each section of the subject will be exhaustively dealt with. Doctors and architects, philanthropists and sanitary engineers, politicians, and literati generally, will contribute their quota. Statistics will overwhelm the uninitiated, and a flood of oratory will, by the aid of the press, flow north, east, west, and south. Congratulations will be offered and accepted, prizes awarded and withheld, each one of the members will vie with his wonted pursuits, the dust of that conference will be swept away, the doors of that conference-hall will be closed, the door-keeper will seek other employment, and yet the great unwashed will remain unwashed, and filthiness still boldly assert itself in most instances; for I sincerely trust some good may accrue, and that the leaders of the movement, by their precept and example, may, during the remainder of their lives, demonstrate the soundness of the decisions come to.

I have written the above with a vivid recollection of another conference, and the momentous consequences which followed. On

the 30th of January, 1878, the following was published:—

"NATIONAL WATER SUPPLY."

CLARENCE HOUSE, ST. JAMES'S, S.W.
 SIR,—The supply of pure water to the population is, at the present time, exciting deep interest throughout the country. Our great cities and populous towns, such as Manchester, Liverpool, Birmingham, and others, are, each for itself, taking steps to obtain an improved and increased supply, whilst the metropolis is seeking further powers from the Legislature with the same object in view. The smaller towns and villages are dependent on accidental sources of supply, and in many instances these are wholly inadequate for health and comfort. While the larger populations are striving, each independently, and at enormous cost, to secure for themselves this article of prime necessity, the smaller localities must make the best shift they can, and, in many instances, are all but without any supply at all.

Under these circumstances, I would draw the attention of the Council to the subject, and suggest whether, at the present time, great public good would not arise from an open discussion of the question in the Society's rooms, with a view to the consideration of how far the great natural resources of the kingdom might, by some large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account for the benefit, not merely of a few large centres of population, but for the advantage of the general body of the nation at large. I have the honour to be, sir, yours faithfully,

ALBERT EDWARD, P.
 President of the Society of Arts.

To the Chairman of the
 Council of the Society of Arts.

Acting upon the suggestion of his Royal Highness, a conference was duly held at the house of the Society of Arts, and the whole subject in all its bearings pretty well exhausted.

I believe a Parliamentary Committee was even formed, but what they advised, or how far the advice, if any, was acted upon, his Royal Highness may know. I do not think the general public do, and I should imagine he must be somewhat surprised at the small amount of good which has resulted from the advice tendered, and proposals then made. However, having failed in his front attack, like a plucky general he is now attempting a flank movement, and those who wish their country good must wish him success.

I apprehend a "health conference" must tackle the water question. The writer of the letter I have quoted says, "that the accidental sources of watersupply in many instances are wholly inadequate for health and comfort."

Now when we have provided for every house an abundant supply of pure water, at all times and at all seasons; when we have ceased to poison our brooks, rivers, and wells; when our seaside health resorts can provide bathing-places, in which we are confident the sewage from the house we have slept in is not undergoing deodorisation in the fluid which surrounds us in our morning swim, we shall have considerably narrowed the health question, and reduced it to limits more easily dealt with. But whilst our supply of water each day is becoming more inadequate in quantity, and more poisonous in quality; when the boldest temperance advocate or the most staunch teetotaler would offer up a prayer for his soul if he had to quench his thirst from the nearest brook or river, before the water had been properly "manipulated," we cannot congratulate ourselves upon having solved this problem of health.

Given pure water in our houses, uncontaminated water-courses and lakes throughout the length and breadth of our land, the remainder could be accomplished, as far as any human enterprise can be accomplished. It would rest then more with the individual than with committees of ways and means.

"If every man would see to his own reformation, How very healthy we should all be as a nation."

As I have slightly altered the original, this jingle illustrates my meaning.

As a nation we must do something more for the individual. Pure water, *prima necessity* as it is, requires other accompaniments. Pure food, and plenty of it, is also requisite if we desire to turn out a healthy man, capable of performing the duties of citizenship,—that is, performing his allotted labour well and faithfully. We shall not find the difficulty so great in giving pure food as in giving pure water. Adulteration of every article of consumption must, and can, be put down with a strong hand, the strong hand of the law. In England, the

machinery for the furtherance of this great object has been provided; but whether such machinery is of the best description, or whether it cannot or will not work, one great fact remains,—it does not. They do these things better in Gaul than in perfidious Albion (*verb. sap.*). Cannot we take a lesson out of our neighbour's book without blotting the page or smudging our own fingers? I think we might. Take bread, for instance. How marvellously strange it is that no two bakers give you the same article for the same money. The flavour, the quality, or the *get-up* are all different. Alum, yeast, German yeast, patent yeast, bone dust, lime dust, *pure* dirt, potatoes, beans, peas, and, I apprehend, anything that can easily and cheaply be reduced to a white powder may,—I do not say do,—account for this; but, why on earth the staff of life should be so whitened and weakened, and have so many knots and splinters in it, when it might be fair, smooth, and strong, is a question requiring an immediate answer. I say, because the administrators of the law do not do their duty. If they have not sufficient powers they should say so, and obtain them.

Can we expect healthy flesh and blood from impure sources? Some doctors say yes, and that one of the articles I have enumerated above will kill when incorporated with a loaf of bread. I would rather have the unadulterated article, and when I pay for it I ought to get it.

We admit the premises of pure water, pure food, ample water,—yes, ample water is a *prima necessity*; then ample food is a *prima necessity*; for we cannot sustain health without the other. We are not simply talking about keeping life in the body. This matter of ample food enters into the policy and polity of the nation, and here we have Scylla and Charybdis before us; we will avoid both, and assume that pure and ample food, as well as pure and ample water, are provided, and well within the reach of all. Then we might pause to reflect that the fact of our having given pure water to the nation has very considerably increased our food supply. Our brooks, rivers, and lakes would abound with fish. We should have solved the question of sewage disposal, and this would mean the fertilisation of our land, not simply by pouring over it the liquid which now runs through our drains to poison the land instead of fertilising it, but by a scientific use of the products to several purposes, obtain the greatest amount of good from each.

From all I can gather, deodorised sewage is positively injurious to land, after a few applications; and when we bear in mind its composition, we cannot be surprised at "sewage poisoning." To start with, human excreta, urine, and soap-suds, from any source, used properly, would render land as productive as could be wished; but we dilute with water, and add from our streets pounded granite, asphalt, lead from flats and pipes, lead mixed with colour, leather, iron, wood fibre, zinc, and other matter which no Cockney, however ignorant he might be, would use, if he knew it, for his back-yard kidney-beans, or his tray of mustard and cress.

We will now suppose that cement or artificial stone is obtained from the sediment of street sewage, and that, by a proper system of working, such fertilising materials as urine should be conveyed direct to our land by separate machinery, that the abominable water-closets which now endanger every house have been swept away, and that poisonous sewer gas is a thing of the past,—that, in fact, instead of using water to poison it, to again poison our streams and wells, we save it, and at the same time save many millions a year, and gain many millions besides. Health will be well within the reach of all.

Now education must do the rest. Each man, whatever his condition, must be taught how to use and not abuse the blessings which surround him. Man cannot be kept clean by Act of Parliament; he can in one way or another be so careless of even the first principles of life as not only to endanger his own, but the life of his neighbour; besides drunkenness, gluttony, uncleanness, and immorality sap health and destroy it.

It may be well to consider in another communication the houses, homes, and habits of the different classes of our population, and to endeavour to see if our health may not be humbly assured, without the building of special cities of health or the entire reconstruction of those

are now inhabit, and what share the architect may have in providing cheerful and healthy dwellings.

MARTIN UNDERWOOD.

P.S.—The doctors have given us such horrors in their descriptions of what is found and can be seen in water that no sooner has paterfamilias been wherewithal to purchase a microscope than he obtains one, and makes his own blood and that of all the members of his family run colder than the water he is examining, by exhibiting the horrible organisms with which the water literally teems. Can it be surprising that he shews water, raw and cold, for his own use?—that he prefers it mixed with a little something short?—to counteract the insanitary qualities of such animalcules?—that his eye and his palate prefer Bass?—and that Guinness in the bottle draught, simply for health sake, has the preference, dark as it may be in colour? The head of the family, so thinking and acting, has his disciples in all the other members, great and small. It is useless to say drink milk and water: the two combined are certain death, for if the poison is not in the water it is assuredly in the milk. Thus temperance is heavily handicapped, that temperance so conducive to health and strength, and an undue use of stimulants encouraged and fostered.

M. U.

"A SYSTEM OF NATIONAL WATER REGULATION."

SIR,—I hope you will allow me to correct a misapprehension which occurs in your courteous review [p. 432, ante] of my paper on "A System of National Water Regulation," read at the Society of Arts on the 12th of March. I did not, as you seemingly suppose, suggest as a remedy for floods the storage of 8,760 million cubic feet, but only of that proportion of a maximum flood which the River Thames is unable to carry off within its natural banks. From the only data available I assumed as a maximum discharge 2,000 cubic feet per second, and the river to be capable of carrying off three-fourths of that volume harmlessly, leaving one-fourth, or 5,000 cubic feet, per second, to be regulated by storage reservoirs. If the maximum discharge maintained for seventy-two consecutive hours, then the quantity for which storage would have to be provided would aggregate 800 million cubic feet, requiring, with an average depth of 20 ft., only 1,500 acres, or 2½ square miles of reservoir surface, an area which, when distributed over the fifteen principal distributaries of the Thames, should prove infinitely difficult nor costly to obtain. In order to show that the expenditure need not be unproductive, I adduced statistics,—first, as to the requirements of the entire population of the Thames basin in regard to domestic supply, and next as to the improvement of the navigation of the river itself during the period of its minimum flow. To satisfy either of those purposes would require a volume of water six times greater than would be necessary to retard an excess in a maximum flood. It is, I repeat, then, quite within the limits of practical financial engineering that a volume of 800 million cubic feet may first be stored, and afterwards be profitably disposed of. Dr. Rankland stated in his lecture on the 17th of March that the daily quantity of water supplied to London amounted to 145 million gallons, or to 23 million cubic feet, or an aggregate of 95 million cubic feet in the year. To assume, therefore, that one-sixth of that quantity may profitably be disposed of with profit amongst the towns and population of the entire Thames basin is surely not unreasonable.

It is perfectly true that in heavy rains, when the ground has become thoroughly saturated, only the whole quantity falling flows off the face, and requires to be carried off by the river. It is exactly such a condition that occurs in a maximum flood; but that flood is itself exact gauge of the quantity of rain that has fallen, and therefore, if the discharge of a minimum flood and its duration is known, the actual shed off and which has produced the flood is also known, and so the utmost quantity which has to be provided for is absolutely determined. The real question, therefore, goes on what is the volume discharged by the Thames in a maximum flood, and the number of consecutive hours for which that volume is maintained.

I have not been able to find anywhere an

authoritative measurement of a maximum flood above Teddington Weir, but I have been informed that a measurement made by the Cooper's Hill students at a bridge near Windsor, during a very high flood in 1875, gave the volume as 14,100 cubic feet per second. Adding a proportionate quantity for the affluents falling in between that bridge and Teddington Weir, which increased that volume to 18,000 cubic feet, my calculation of 20,000 cubic feet per second is, therefore, an excess on the safe side; but if I have allowed too little I shall be glad to be corrected, and informed of the greatest discharge which has ever been actually measured. A flood of 20,000 cubic feet per second maintained without any variation for seventy-two consecutive hours would discharge in that time 5,184 millions of cubic feet, and as the area of the Thames basin above Teddington measures 3,676 square miles (according to the Rivers Pollution Committee's report), or 102,481 million square feet, the above volume would be equivalent to '6768 in. flowing off the whole area. The rainfall producing that flow would depend on the proportion of it that was absorbed. The fact is that a heavy storm rarely falls over the whole of any considerable area at the same time, but travels more or less quickly over it in a direction which is governed by the prevailing atmospheric conditions.

Hence floods in the Thames, as in all rivers draining large basins, are the result of storms of rain falling over only a certain portion of them, and therefore the fact of 3 in. of rain in a day at Banbury or any other particular town is no gauge of the quantity falling on the same day over the whole basin, or even over any considerable fraction of it, and therefore can be no guide as to the possible volume which the river may have to discharge in consequence.

The basis of all calculations in regard to maximum floods must be the actual measured discharge at the extreme height, and the time of its duration at that height. My suggestions are based, not on the storage of any given number of inches of rain, but of a definite proportion of the measured volume of a maximum flood, which is the fixed product of two relatively variable factors,—rainfall and area.

As I have apparently failed to convey a clear idea of the method by which a system of regulating reservoirs in connexion with floods may be worked, I would ask your permission to add a few words of explanation thereon. In a country like England, where careful meteorological observations are kept throughout its length and breadth, there can be no difficulty in ascertaining the exact rainfall over any particular area, or in tracing the path of particular storms which have occasioned the highest floods recorded of its various rivers, and so in arriving at the probable direction which future storms occurring under similar atmospheric disturbances are likely to follow. With the scientific aids afforded by the telegraph and telephone for simultaneously recording measures which without such aids would formerly have had to depend more or less on probabilities may now be adopted with confidence on certainties. Hence I fail to see why the storage of the excess waters of a maximum flood, if properly designed and adjusted, may not be regulated and manipulated with absolute precision.

Of course the reservoirs, which would only begin to be filled as soon as the rise of the flood in the main river approached the limits of overflow, would never be left full, but would commence to discharge their contents successively as soon as that flood began to abate, and they would thus be always kept ready against the arrival of the succeeding flood during that period of the year when storms prevail. After that period has passed, the reservoirs may be permanently filled for after distribution to any of the many purposes for which their water may be required.

The system of minimising the effects of floods by the help of storage reservoirs is only an imitation of the processes we find where Nature works on a large scale, as, for example, in the great lakes of Equatorial Africa, in America, and in the lagoons of Australia; and on a smaller scale in the lakes of the United Kingdom. Some of the greatest engineering successes as well as discoveries have been the result of a careful study of natural operations, and this particular method of regulating floods is no exception to the rule. If the English lakes were capable of discharging a portion of their contents from the summer level as soon

as their surfaces commenced to rise above it, instead of after they have become filled to the level of their overflow, the rivers supplied by them need never be subjected to floods. Just in the same way may similar works, only on a smaller scale, be adapted to the principal tributaries of a river like the Thames, by adjusting the surface area of the reservoirs, and the size of the discharging outlets in the proper proportion to the maximum discharge of the tributary itself.

I will not enter further into engineering details, for I feel I have already trespassed too much on your space, and I will, therefore, only add my obligations to you for permitting me to occupy so large a portion of your columns.

F. H. RUNDALL,
Lieut.-General, C.S.I., R.E.

THE SANITARY INSPECTION OF DWELLINGS.

SIR,—I consider it important that attention should be drawn to the "Sanitary Inspection of Dwelling-houses Bill" now before Parliament, and noticed in your issue of the 22nd ult. [p. 397] as a matter deserving of serious consideration, affecting, as it will do, the sanitary administration of local authorities, and the power of their chief officials.

Whilst the main purpose of the Bill,—in regulating and enforcing the sanitary construction and supervision of new buildings, and giving additional power to local authorities in cases of nuisances arising from defective drainage and house construction beyond those contained in the Public Health Act, 1875,—is commendable, and its adoption desirable, yet, when the examination of and reporting upon the plans of new buildings, the inspection of buildings during erection, and the granting of certificates upon their completion, as well as the power of entry upon premises to open ground and do other works necessary for the examination of defective drains and faulty building construction, and afterwards making good the same, are removed from the town surveyor to a sanitary inspector, it will be manifest that some amendment of the Bill is essential.

Apparently, it is not intended that professional men should be employed for this purpose, or undoubtedly it would have been so stated, and it would be altogether out of the question to suppose that a local authority, unless compelled, would saddle itself with the additional expense which such an appointment would incur, when, in all probability, a duly qualified professional man is already engaged as surveyor in the district. But the surveyor, who not only should be the responsible head in matters of this kind, but actually is, excepting in large towns where an efficient engineer's staff is maintained, the only official qualified to examine and advise upon the structural works, will be entirely ignored by the provisions of the Bill, and important and responsible work requiring careful examination and direction entrusted to new and inexperienced officials, who necessarily must be subordinate officers.

"I am not a surveyor," said the sanitary inspector of a not unimportant local board district, when in course of examination before a bench of magistrates recently, "and therefore cannot say how the drain should be constructed to prevent sewer-air entering the house"; and when we consider the class from which sanitary inspectors are usually selected, it is not to be wondered at that he could not venture an opinion upon a subject of a technical character, nor would it be reasonable to expect such work from any inspector.

Clearly the Public Health Act, in its present form, is too general in its application for modern requirements, and some more definite legislation is needed; but why not simply amend the Public Health Act, 1875, by embodying in it a revised form of the model by-laws issued by the Local Government Board?

At all events, it is very important that "Surveyor" should be substituted for "Sanitary Inspector" in the Bill; or that, at least, it should be clearly set forth that the inspector shall be under the direction of the town surveyor, to whom the inspector shall report as occasions require.

The compulsory adoption and enforcement of the model code of by-laws already referred to would have rendered further legislation unnecessary.

ROBT. S. SCOTT.

Ventnor, I.W., April 2nd, 1884.

ADMIRALTY AND WAR OFFICES COMPETITION.

SIR,—After five months' hard work about 130 architects (and firms of architects) competed for these buildings; the drawings were sent in on the 1st of March. It must have taken two days to hang them. There were five Sundays in the month; and the result was made known in the morning papers of the 1st of April. Now, supposing the judges worked up to late on the 31st of March, they got through their labours in twenty-three days. I reckon that each set of designs contained six plans, three sections, and three elevations, or 1,560 most elaborate drawings, and 130 reports. Considering that each judge is supposed to have conscientiously examined the whole of the drawings, it is a mystery how Mr. Shaw-Lefevre, Mr. Childers, and Mr. W. H. Smith could have found time from their Parliamentary duties for the work; and how each of the five could in so short a time have agreed upon the nine selected designs. Anyhow, I am sure the rest of the competitors will agree that the decision was a most hasty and unexpected one; and they will all refuse to believe that they have been fairly treated, unless an exhibition of the whole of the designs can be managed after the second competition has been decided upon. Having done the whole of my drawings myself, I know how impossible it would be for any man to understand in twenty-three days the whole of the designs submitted; and as to five men understanding them, and all agreeing as to the best one, it is an impossibility, unless they made some arbitrary rules of their own which might exclude three-fourths of the lot without examining them. A COMPETITOR.

THE CONSTITUTIONAL CLUB.

SIR,—May I ask you to be good enough to correct a mistake in your last issue as to this building, now in course of erection from my designs in Northumberland-avenue? By special permission of the Metropolitan Board of Works it will be faced entirely with red and buff terracotta, interspersed with glazed falcene panels, and not with stone. I may add that I am indebted to the courtesy of the members of the Board, and to the recommendation of their architect, Mr. Vulliamy, for the permission to depart from traditional rules, and to substitute for stone a material which I believe to be specially suitable for all buildings subject to the deleterious influences of smoke and chemical impurities of town atmospheres.

ROBERT W. EDIS,
Architect, F.S.A.

14, Fitzroy-square, W.,
April 5, 1884.

** We readily insert this, but the mistake was not ours. We quoted the source of the paragraph in question.

"ANCIENT LIGHTS."

SIR,—I think if your correspondent "Ignorans" [p. 461, ante] had read the cases carefully he would have noticed how different they are; but it is no doubt very difficult to follow complicated cases, and I will with pleasure try to give fuller explanation.

Former owner, whom we will for brevity call Z, conveyed one tenement to A, who enlarged his windows with the knowledge of Z; afterwards Z conveyed the adjoining tenement to B. B stopped, because the outlay by A was made with the knowledge and consent of Z, and therefore B could not possibly have greater right than (former owner) Z, and it is clear Z could not bring any action, having given his consent.

Therefore, it will be seen that in this case the law is very simple. The decision upheld the doctrine that a man can only give or grant what he possesses, and as by his grant to B he had deprived himself of certain rights of lights, therefore he could only grant subject to such easements.

Now as to the second case quoted. The case is totally dissimilar to the preceding. It is a case where, at one and the same time, a person (say Z) grants portions of an estate to, say A and B. Now the judgment was based on the fact that in granting or conveying portions of the estate, no easement was mentioned, and, therefore, as one part of the land had not

acquired ancient light against the other part, by reason of there having been only one owner, namely Z, of the whole, no right of light existed at the date of sale.

Your correspondent will, therefore, see how different the two cases are. Of course I am not defending the decisions; that is not my province; I merely give the legal decisions, as those alone are valuable as a guide.

BANISTER FLETCHER.

29, New Bridge-street, E.C., April 2.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—In common with all Associates I have read with much interest Mr. McLachlan's letter in your issue of the 22nd ult.

The Institute has a grand opportunity, now in its jubilee year, of reforming its charter, and giving to the Associates a much better position than that which they now hold. It is, indeed, no uncommon thing for members to be asked, "What is the use of your Associationship?" And I confess that it is difficult to give a satisfactory answer.

It has been shown that this class of members contribute very largely to the funds by their entrance fees, and to the income by their subscriptions. In return they get but little encouragement. Hence we hear of some talking about leaving, and of others forming a new society. This should not be. The Council must be aware that there is a widespread feeling of dissatisfaction among the Associates at their position being not more fully recognised, and they will, I hope, devise some means by which the privileges of the Institute may be extended to them. We cannot, and do not, expect to have rights to the extent which Fellows enjoy, but we ask nothing unreasonable when we request that a PROPORTIONATE amount of such rights and privileges may be accorded to us.

I am sure that if the Council will take this matter seriously in hand, the separatists will no longer be heard of, the Institute will take the position which it ought to, and the Associates will loyally support it.

SIDNEY YOUNG.

STANDARD THEATRE.

SIR,—As you published [p. 459] the requirements of the Metropolitan Board of Works, and a report of the arbitration, your readers may wish to know the result.

My clients proceeded to make some of the alterations immediately they received the notice, and undertook to comply with many of the requirements, so that only two or three points really remained for Sir Henry Hunt to deal with.

The first point in dispute was the enclosing of certain staircases with brick walls as stated in the fourth requisition, and the arbitrator has decided that wrought-iron grilles are to be securely fixed to the said staircases instead of the existing hand-rails.

The second point, an additional staircase to the gallery, has been ordered by the arbitrator, although the existing staircase is unusually wide.

The third and last; the separation of the scene-dock from the stage and the scene-dock from the property-rooms (under the railway-arches) has not been confirmed by the arbitrator.

It will thus be seen that while the requirements of the Metropolitan Board are, in the interests of the public, very thorough and comprehensive, the owners of the Standard Theatre have endeavoured to do their best, regardless of expense, to render the theatre one of the safest in London.

HENRY LONGBRILL.

26, Budge-row, E.C.

UNAPPROVED DESIGNS.

SIR,—A "C. E." (also described as an architect) is engaged upon a cemetery competition, and agreed to pay me a certain sum for complete designs for two chapels, upon condition that these should be "submitted" to him in pencil before inkling in; and further, that the whole should be delivered by a fixed date. In the event of success a bonus to be given in addition. I duly forwarded the pencil designs, but they were returned to me with serious alterations, my work being rubbed out and obliterated, very roughly scribbled sketches and written notes being substituted. I propose to sue for compensation upon the ground that, if not approved, my drawings should have been returned in good condition, and either have been declined altogether or have been accompanied by suggested alterations upon tracing or other paper. The property of the objector, I am maintaining also that the alterations were so unreasonable in nature and extent that no one could have finished them by the time agreed upon, even if so disposed.

I shall feel obliged to any who can give information respecting cases of a kindred nature that have come before the law courts. It would be clearly wrong of a patron to daub over an artist's picture if disapproved of, and I consider that an architect is, in this respect, similarly situated.

A.R.I.B.A.

KEEPING NOTES.

SIR,—Your article, "Where to Turn," in the last number, emboldens me to put a question, which I have often been on the point of putting to your readers. Of the three price-books to which you direct notice, — Laxton keeps steadily to Keene's cement, — a way of spelling the name which seems to have the authority of manufacturers' circulars, whereas the others indulge in variations such as Keen's, Keene's, and occasionally Keene's as well. Is some one, — this was the question I meant, — keeping notes about Keene, Martin, Fether, Moore, Claridge, &c., whose names will by chance become as fixed in the language as that of Macadam? I do not claim for Mr. Keene any special honours, — most of us who make money out of our inventions are content with that simple reward, — but future dictionary-makers and writers in *Notes and Queries* deserve some consideration. What a sense of human nature at large being foiled chills our feelings when an editorial note informs the world that "every effort to trace the origin of this seems to have failed."

A QUERIST.

ANTS IN HOUSES.

SIR,—It is well known that many London houses are infested with ants. If any of your numerous readers would give their experience effectually dealing with the little pests, it would be a boon to many, amongst them your inquiring

SUBSCRIBER OF TWENTY YEARS.

A CAUTION TO BUILDERS.

At the Wandsworth Police Court on Friday, the 4th inst., Mr. Charles West appeared in answer to a summons taken out by the Wimbledon Local Board against him for erecting a new building within a distance of 10 ft. from another building in the Lower Worple-lane, Wimbledon, without causing the external wall of such building to be carried up so as to form a parapet 1 ft. at least above the roof or gutter adjoining such external wall. Mr. Whitfield appeared in support of the summons. Mr. Cooper, assistant surveyor, was called, and proved the infringement of the by-laws. The defendant contended that he had not completed the building, as he intended to carry the upper portion thereof over the 4 ft. passage adjoining, so as to connect his building with the house on the opposite side of the passage.

Mr. Paget held that the defendant had contravened the by-laws, and imposed a fine of 40s. and 2s. costs, and pointed out to the defendant that he was liable to a penalty of 40s. for each day that the necessary works were not carried out.

The fine and costs were paid by the defendant before he left the court.

PAVING APPOINTMENTS.

WILKINSON V. COLLYER.

THIS case (tried in the Queen's Bench Division on the 31st ult., before Mr. Justice Manisty and Mr. Justice Willes) raised an important question as to the liability of a tenant to recoup the landlord a proportion of the sums the latter may have been called upon to pay towards the expenses of paving the street in which the house is situate. The plaintiff in this case was the owner of several houses in a street in Peckham, one of which was let to the defendant on a three years' agreement at a rent of £81. per annum. The houses were built some thirteen years ago, and recently the Vestry, under the powers given to them by the Metropolitan Management Acts, had paved the street and had apportioned the expenses of so doing among the owners of the houses in the street. By the defendant's agreement of tenancy he had agreed to pay all the rates, taxes, and assessments that might become payable in respect of the house during the term, except landlord's and property tax, and the plaintiff contended that under this agreement the tenant was bound to repay to him the sum he had been compelled to pay in respect of the house for the paving of the street, and accordingly sued the defendant for the amount, 207. 17s. The action now came on for judgment on admissions on the pleadings.

Mr. Justice Manisty, in giving judgment against the landlord's contention, said that by the Metropolitan Management Act, 1855, it was provided that if the owners of the houses in a street did not pave the street to the satisfaction of the Vestry or the Local Board, the Vestry or Board might do so. The necessary work, and recover it from the owners of the houses; and by the amending Act of 1862 the expenses which the owner of a house might be liable to pay under the existing Act might be recovered from the owner or occupier, but if recovered from the occupier, the amount was to be deducted out of his rent. That appeared to his Lordship to create a charge upon the owner for something done in the nature of a permanent improvement to his property, and not such as should be paid for by the tenant, who might have only a tenancy for one year, and yet be liable for the whole of this expense. If, however, the tenant had expressly contracted to pay, he would, of course, be liable; but in the present case,

this Lordship said, he had not done so; such a charge was not a tax, rate, or assessment within the meaning of his agreement.

Mr. Justice Watkin Williams gave judgment to the same effect.

Judgment for the defendant.

PROVINCIAL NEWS.

Bristol.—Mr. F. C. J. Fisher, umbrella manufacturer, has lately rebuilt his premises, Nos. 29, 31, 33, and 35, Union-street. The fronts are of red brick, relieved by dressings of Bath stone. The work has been carried out by Mr. R. F. Ridd, builder, of 32, Moon-street, the architect being Mr. Thomas Nicholson, of Guildhall Chambers, Broad-street.—In the neighbourhood of Canons' Marsh a new road has been formed by the waterside, from St. Augustine's Parade as far as Anchor-lane, with an easy gradient from College Green. A portion of the site of Green's Dock has been let by the Corporation to Messrs. Rowe Bros. & Co., who are proceeding with the erection of extensive premises, to consist of offices, warehouses, and lead-rolling mills. The premises, as at present arranged, will cover a site about 220 ft. in depth and 50 ft. in width. The architect appointed by the firm is Mr. Herbert J. Jones, of Wellington Chambers, Bridge-street, under whose directions the foundations are now being put in by Messrs. Jowell & Son, builders, at a cost of about 570l. The tender of Mr. T. R. Lewis, amounting to 1755l., has been accepted for the works.

Baldon.—Captain R. C. T. Hildyard, one of the Local Government Board Inspectors, held an inquiry on the 26th ult. at the offices of the Baldon Local Board, with reference to the application of that body for the sanction of the Local Government Board to borrow 1,336l. for works of sewerage, water-supply, street improvements, and lighting. It was stated that the population of the board's district was 5,430; annual rateable value, 14,117l.; acreage, 2,604; present debt, 12,392l., mostly borrowed from waterworks. It is proposed to lay an 18-inch sewer pipe from the railway to Brook-hill, and the inspector strongly advised the board to construct a sewer in Kelcliffe. The proposed expenditure on waterworks is to lay mains in various parts of the district where a supply is at now obtainable. No opposition was made to the proposals of the Board.

Bridlington.—The Commissioners of the Bridlington Piers and Harbour have accepted the tender of Messrs. R. Moffat & Son, Paisley, conditionally, for carrying out the harbour improvement. This was the lowest tender, 3,644l.; the highest was 7,100l. The Harbour Commissioners resolved to re-deck the greater portion of the pier.

Bradford.—It is stated that the legal questions affecting the title of property in Well-reet, Bradford, which the Corporation last year agreed to sell to the Government as the site for the new post-office, have been satisfactorily settled, and it is understood that the purchase will be completed without further delay.

Rochester.—The Theatre Royal at Rochester, which is one of the oldest of the provincial theatres, is about to be demolished, after being used for performances for considerably over a century, the building having been disposed of for the purpose of the erection on its site of a Conservative Club for the City of Rochester.

CHURCH BUILDING NEWS.

Gateshead.—The Gateshead Church Extension Society contemplate building three new churches at Gateshead, viz.:—One to be dedicated to the venerable Bede, Sunderland-road; St. Paul's, W Teams; and Holy Trinity, High-street. The committee, being of the opinion that a good serviceable building, meeting in every respect the needs and requirements of the big worship of the Church of England, can be erected at a cost not exceeding 5l. per sitting, thought it would be expedient to endeavour to obtain such churches for the poor parishes of the Venerable Bede and St. Paul's, W Teams, and therefore they invited several architects to furnish plans for churches which, while not exceeding the cost of 5l. per sitting, should seat 500 persons, and be capable of being enlarged so as to seat 600. After a careful examination of the plans submitted, the committee selected that of Messrs. Oliver Leeson as most suitable for the Church of

the Venerable Bede. From tenders received, it is stated that the church can be erected for the sum of 2,550l. The church will comprise nave, seating 400 persons; north transept, seating 83 persons; south transept, seating 99 persons; choir, seating 42 persons,—total, 624 persons. There will also be an organ-chamber and a large vestry suitable for a parish-room. The contract for building this church has been let to Mr. Alexander Thompson, builder, Gateshead, and the work will be proceeded with very soon. The committee expect that in a few weeks they will be able to commence the erection of a somewhat similar building for the district of St. Paul's, Low Teams, plans for which are also being prepared by Messrs. Oliver & Leeson.

Chedzey (Somerset).—The restoration of the chancel of the large and interesting Church of St. Mary the Virgin at Chedzey, near Bridgewater, is to be commenced immediately after Easter, under the directions of Mr. Singsby Stallwood, architect, Reading. The chancel possesses many interesting features of the thirteenth century, and some rich examples of Tudor and Jacobean woodwork, while the nave, as in many other Somerset churches, is extremely rich in carved fifteenth-century woodwork. The rood-screen still exists, though much mutilated, and this will be restored and surmounted by a roof of lofty proportions. The contract has been taken by Mr. Spiller, of Taunton.

Poynton.—The parish church of Poynton is now to have its tower and spire, and a contract has just been entered into between Messrs. Ellis & Hinchliffe, the masons and contractors, and Lord Vernon, the steeple being erected as a memorial to the late Baron. The design is by Messrs. Medland & Henry Taylor, architects, Manchester, and the work is now going on under their superintendence.

St. Helen's.—Holy Trinity Church, Parrmount, St. Helen's, was re-opened on the 29th ult., after undergoing extensive repairs and the addition of a chancel and vestry. The church was consecrated on February 26, 1857. After several recent attempts to put the church in a state of repair, which have failed (we read in the *Liverpool Post*) on account of the peculiar atmospheric influence affecting the material of which the building was constructed, it was resolved to thoroughly renovate it. This has been done. A new chancel and vestry have been added, a new heating apparatus has been put in the church, and an enclosing wall has been erected. The total cost will not be far short of 1,300l.

Desford.—St. Martin's Church, Desford, Leicestershire, has been enriched by the addition of a handsome pulpit, which is in Caen stone. The top contains three panels which are filled respectively with figures of our Lord, St. John, and St. Martin. The caps of the panels are supported by marble columns, and the whole is surmounted by a richly-carved cornice. The whole was executed by Messrs. Jones & Willis.

Pendleton.—St. Anne's Church, Brindle Heath, Pendleton, is being adorned with a reredos and arading of oak, at the cost of Mr. C. J. Heywood, the eminent banker. The work is being executed by Mr. Thomas Scott, from the designs of Messrs. Medland & Henry Taylor.

Peckham.—The new Church of St. Mark, Peckham, which was consecrated on the 1st inst., has been built from the designs of Mr. C. Luck, architect, of Carlton-chambers, Regent-street. It consists of a nave and two aisles, the latter being formed by arches, supported by pillars of plain Bath stone. The floor is of concrete, and the chancel is paved with tiles. There are a vestry-room and organ-chamber on either side of the building, the exterior of which is of red brick with stone dressings. The contract was carried out by Mr. Manley, of Regent's-park, the amount of it being 7,266l., and, with the cost of the hot-air heating apparatus, supplied by Mr. Grundy, and other charges, the whole expenditure will be about 8,000l., and this provides 800 sittings. The seats are of deal, and the Communion-table, pulpit, and reading-desk of oak.

Society of Engineers.—At a meeting of the Society of Engineers held on Monday evening last, at the Westminster Town-hall, Mr. Arthur Higg, president, in the chair, a paper on "An International System of Marine Course Signalling," by Captain W. B. Barker, U.S.A., was read.

STAINED GLASS.

Clitheroe.—A window in memory of the late Lord Justice Holker has been placed in Waddington Church, Clitheroe, by Lady Holker. The subject chosen is the giving of the Law. Moses is represented partially unveiled, having descended from the mountain with the Tables in his hands. Around him, in attitudes of reverence and fear, are placed the chiefs of Israel. The thunder and the lightnings and the terrible upheavings of nature which had betokened the special local presence of God have passed away, but the distant mountains and the still, awed expression of the people signify what has happened. The colouring of the window is rich. Messrs. Lavers, Westlake, & Co., of Endell-street, Bloomsbury, have the credit of executing this work.

Whitley.—The large west windows of Christ Church, Whitley, have recently been filled with painted glass, the cost of which has been defrayed by the munificence of an anonymous donor. The designing and execution of the work were entrusted to Lavers, Westlake, & Co., of Endell-street, London. The subjects of the windows are devoted to the Incarnation, and illustrate the earlier scenes in our Lord's life, together with the types which foreshadow them. There are three rows of figures in each window. In the central and upper rows of the window on the south side there are representations of the Annunciation, the Adoration of the Magi, and in the lower row appear the types predicting this event, the manifestation of Jehovah to Moses at the burning bush, and the visit of the Queen of Sheba to Solomon. On the north side the central figure is the Presentation of Christ in the Temple, and above it the Baptism of our Lord. In the lower series the Old Testament types are the presentation of Samuel to Eli, and the passage of the Israelites through the Red Sea. In the tracery there is a representation of the infant Saviour and the Virgin, with angels in adoration. The style of the details of the windows is that which prevailed in the 14th century.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

March 21.—5,253, T. Fraser, Aberdeen, Fire-grates.—5,255, W. Tuffee, Gravesend, Coping Tile.—5,265, D. Walker, London, Chimney-top.
March 22.—5,231, J. Friend, Exeter Water-waste Preventer.—5,318, H. Patsky, Berlin, Fixing Scaffold, &c. Com. by L. Muth, Berlin.—5,323, R. Steadman, Willesden, and W. E. Edwards, Isleworth, Fire-places.—5,327, J. Sibbald and W. Kinnes, Dundee, Water-closets.—5,336, H. Hardy, London, Heating-stoves.
March 25.—5,384, J. E. Russell, Spindon, Kitchen Ranges.—5,396, T. Thornton, Bury, Floor-ramp.
March 26.—5,466, W. Bell, Carlisle, Flushing and Ventilating Drains.—5,480, J. Adams, Liverpool, Ventilation, &c.—5,489, T. Dugard, London, Grate-bars. Com. by J. Naeher, San Francisco, U.S.A.—5,494, D. Hynd, Dundee, Flushing Water-closets.
March 27.—5,525, T. C. Morgan, Hay, Fastening Sash-windows.—5,545, M. Syer, London, Water-closets.—5,563, J. B. Pottier, Yeovil, Stoves and Fire-places.—5,568, A. M. Clark, London, Fire-proofing the Joists, &c., of Buildings. Com. by W. H. Dolman, New York, U.S.A.
March 28.—5,592, A. Steenberg, Copenhagen, Roof Covering. Com. by C. Schourup, Viborg, Denmark.—5,594, J. Grundy, London, Warm-air Fire-grate.—5,596, C. E. Harton, Ashton-on-Mersey, Fenders.
March 29.—5,633, C. Winn, Birmingham, Flushing Closets, Urinals, &c.—5,644, W. Unsworth, Liverpool, Window-blinds, &c.—5,675, W. Sanderson, Durham, Fastening for Doors, Gates, and Casements.—5,676, H. W. Buchan, Edinburgh, Water-closets.—5,680, J. Finchen, Market Lavington, Glazing.
March 31.—5,693, G. Burnell, Bristol, Inodorous Privy.—5,696, W. P. Thompson, Liverpool, Waterproof Flooring. Com. by A. Dameron and A. Cassard, Brussels.—5,706, W. M. Simons, Nottingham, Roller-blind Furniture.—5,742, F. E. Street, London, Building in Concrete.—5,743, J. M. B. Baker, London, Deodorising Apparatus for Water-closets, &c.
April 1.—5,762, W. Baird, Dublin, Sanitary Apparatus.—5,763, R. Cox, Bristol, Ventilating Gas Stove.—5,785, J. Kell, Durham, Chimney-top and Ventilator.
April 2.—5,811, W. Devoll, Erdington, Flushing Water-closets, Drains, and Sewers.—5,824, E. Do Pass, London, Fasteners for Curtain Cornices. Com. by W. Zupp, Frankfurt.—5,845, E. S. Romilly, London, Chimney-pot.
April 3.—5,870, J. R. Meilie, London, Disinfecting Water-closets. Com. by T. S. de Deinheim, * Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

Brooches.—5,873, J. Barnes, Manchester, Damp-proof Material for Lining Walls, &c.—5,880, W. Moyes, J. Moyes, and W. Moyes, Pollockshields, Water-closet Basins.—5,881, T. Robb, Glasgow, Connecting together Tiles and Wooden Blocks for Paving, Flooring, &c.—5,883, R. A. Lowe, Chislehurst, Sash-windows.—5,889, W. Meakin, London, Window-sashes.—5,892, J. Thompson, London, and J. Hatfield, Kew, Construction and Hanging of Doors.

SPECIFICATIONS ACCEPTED.*

March 25.—212, G. W. Webb, Reading, Ventilation.—3,988, T. Whitehead, Liverpool, Chimney-tops, &c.

March 28.—3,913, W. Devoll, Erdington, Flushing Water-closets, Drains, and Sewers.

April 1.—2,578, S. Turner, Barrow Haven, Ridge Tile for Ventilating.

April 4.—457, J. Jones, Johnstown, Bricks for Facing Buildings, Walls, &c.—2,576, W. Crook, Salisbury, Fire-places, Grates, Stoves, &c.

NOTICES TO PROCEED

Have been given on the Dates first named.

March 28.—5,513, R. Evans, London, Flues, &c., for High Dwellings (Nov. 24, '83).—5,526, H. Hancock, London, Fastenings for Doors and Windows (Nov. 26, '83).

April 4.—5,585, W. J. Penny, London, Window-sashes, &c. (Nov. 30, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending March 29, 1884.

3,109, E. G. Banner, London, Construction of Pavements and Roadways. (June 22, '83, price 10d.)

The kerbs are made of blocks of concrete, &c., and passages are made therein for gas-pipes, telegraph-wires, &c.

3,788, A. J. Boulton, London, Chimney Tops or Cows. Com. by J. Wüster, Ansee, France. (Aug. 2, '83, 2d.)

Above the chimney-top is a cover, supporting on a central pivot an inclined plate with a vane above, which causes the plate to present its top to the wind, allowing the smoke, &c., to escape behind. (Pro. Pro.)

3,805, J. B. Petter, Yeovil, Ovens for Cooking-ranges. (Aug. 3, '83, 2d.)

The doors are formed of sheets of wire gauze set in the frames. (Pro. Pro.)

3,848, W. Clark, London, Fire-places and Fire-backs. Com. by J. H. Burnam, Fayetteville, U.S.A. (Aug. 7, '83, 6d.)

To heat two adjoining rooms by one fire the fire-place is made right through the intervening wall and a curved metallic fire-back to the fire-place projects into the one room and heats it while the fire itself heats the other.

3,852, G. Dreghorn, Inverness, Venetian Blinds. (Aug. 8, '83, 2d.)

The ordinary tapes are dispensed with, and the laths are supported by links and bands of metal. (Pro. Pro.)

3,941, H. J. Haddon, London, Artificial Stone. Com. by J. Hemmerling, Düsseldorf. (Aug. 14, '83, 2d.)

These bricks, blocks, &c., are made of metallic oxide, soluble glass, furnace slag, and cement and slag sand or silicious sand, in moulds, and are afterwards twice impregnated with soluble glass.

Published during the week ending April 5, 1884.

3,887, J. Finney, Bocking, Attaching Door-knobs to their Spindles, Aug. 10, '83, 2d.

When the knob is screwed on the spindle a pin therein enters one of a series of holes in the flange of the collar. (Pro. Pro.)

3,94, L. Stiebel, London, Construction of Roadways, Aug. 14, '83, 2d.

A layer of hot powdered asphalt is placed on the surface of the ground, which may have been previously prepared with concrete, and broken stones are rolled in level with the asphalt.

4,094, W. Thompson, Wexford, Walls for Fences, Buildings, &c., Aug. 24, '83, 6d.

These are made of corrugated concrete, and the corrugations are vertical.

MEETINGS.

WEDNESDAY, APRIL 10.

British Archaeological Association.—(1) Conclusion of the Rev. S. M. Mayhew's paper on "Tenby and St. David's Cathedral." (2) Dr. Wake Smart on "Antiquarian Researches at Nuremberg and its locality." 8 p.m.

Edinburgh Architectural Association.—Dr. R. M. Ferguson on "Electric House-Fittings."

Royal Meteorological Society.—(1) The Hon. Ralph Abercrombie "On the Origin and Course of the Squall which captured H.M.S. *Exeter*, March 24, 1873." (2) Captain J. W. C. Martyr on "The Weather Forecasts for October, November, and December, 1883." (3) Mr. William F. Stanley "On Certain Effects which may have been produced in the Atmosphere by Floating Particles of Volcanic Matter from the Eruptions of Krakatoa and Mount St. Augustine." 7 p.m.

THURSDAY, APRIL 17.

Chemical Society.—8 p.m.

FRIDAY, APRIL 19.

Architectural Association.—Members' Soirée, at Westminster Town-hall, Caxton-street, Victoria-street. 7.30 p.m.

SATURDAY, APRIL 19.

Architectural Association.—Visit to Houses in Kensington Court (Mr. J. J. Stevenson, architect). 3 p.m.

Edinburgh Architectural Association.—Visit to Hallyards Castle and Kirkcaldy.

* Open to public inspection for two months from the dates named.

Miscellaneous.

Yorkshire Association of Medical Officers

of Health.—A meeting of this Association was held on the 28th ult., in Leeds, when Dr. Goldie (Medical Officer of Health for Leeds) read a paper on "Our Epidemic Diseases, and How they are Spread." He was of opinion that there were certain climatic conditions during certain years which either assisted in creating some of the infectious diseases, or, at all events, were so favourable to their spread and active vitality as to signalise them as epidemic years. He would quote the year 1872, immediately preceding his acceptance of office in that town. The death-rate from the seven principal zymotic diseases amounted to 6.3 per 1,000, and the year 1870 showed a death-rate from the same diseases of 6.6 per 1,000. Contrast either of these two years with that of 1877, in which the death-rate from those seven diseases fell as low as 2.7 per 1,000, and they must be forced to a suspicion that there was some other cause for this sudden and marked decline in the death-rate than the mere checking of infection from anything that he could accomplish. Those other causes and conditions must be known to them before they could combat with them, but once they became acquainted with those conditions which were most favourable to the active existence of infectious diseases, then they could place themselves on the most favourable footing to meet those epidemic influences. At present those influences were beyond their ken, but there were others which were quite easily within. After some discussion Dr. W. K. Giddings, Medical Officer of Health for Calverley, read a paper on some of the results of ten years' sanitary work in Calverley. He said that the sanitary work of Calverley had been of a very humble kind. They did not treat their sewage in any way, except to plenty of fresh air; they did not scavenging; they had no public or even recognised slaughter-houses. The cost of their entire staff of health officers was 18l. per year.

Commercial Failures.—The number of failures in England and Wales gazetted during the week ending Saturday, April 5th, was 63. The number in the corresponding week of last year was 211, showing a decrease of 148, being a net decrease in 1884, to date, of 1,825. The failures were distributed amongst the following trades, and, for comparison, we give the number in each in the corresponding weeks in 1882 and 1883:—

	1884.	1883.	1882.
Building Trades.....	8	20	20
Chemists and Druggists.....	4	4	2
Coal and Mining Trades.....	2	7	5
Corn and Cattle.....	2	3	8
Drapery Trades.....	7	15	18
Earthenware Trades.....	1	1	1
Farmers.....	6	13	14
Furniture and Upholstery Trades.....	—	37	49
Grocery and Provision Trades.....	12	37	49
Hardware and Metal Trades.....	7	16	14
Iron and Steel Trades.....	2	6	7
Jewelry and Fancy Trades.....	3	6	5
Leather and Coach Trades.....	8	16	14
Merchants, Brokers, and Agents.....	8	23	18
Printing and Stationery Trades.....	1	1	7
Wine, Spirit, and Beer Trades.....	3	25	27
Miscellaneous.....	5	25	22
Totals for England and Wales.....	63	211	228
Scotland.....	22	22	16
Ireland.....	1	2	5
Totals for United Kingdom.....	86	235	247

—*Kemp's Mercantile Gazette.*

The Exhibition Building of '51.—The eighth and last of a course of lectures on "General Engineering Construction," by Mr. J. W. Wilson, principal of the Crystal Palace School of Practical Engineering, was delivered on the evening of the 3rd inst., in the reading-room of the Society of Engineers, Victoria-street, Westminster. The lecturer commenced by giving a short history of the origin of the Exhibition of 1851, and the manner in which the novel form of structure then adopted was arrived at. He then proceeded to describe in general nature of the building, and the way in which the difficulties of construction were surmounted, giving also statistics as to the enormous amount of material employed. He then described the removal of the Hyde Park building to Sydenham, the manner in which it was altered to suit the new requirements of the position, adding information as to the arrangement of the water-towers and the various engines employed for the purpose of pumping the water, concluding with some general remarks upon the advantages and disadvantages of such structures, together with information upon the cost of maintenance.

Legislation on Dairies and Milkshops.

The petition of the Council of the National Association for the Promotion of Social Science, which has been presented to Parliament, to the Privy Council, and to the Local Government Board, contains some very urgent reasons why the control of dairies and milkshops should be vested in the local sanitary authorities, and not in the veterinary authorities as heretofore. The petition shows that, with few exceptions the latter possess no sanitary organisation or machinery whatever for the inspection of such places; that the Orders of Council, framed under the Contagious Diseases (Animals) Act of 1878, have remained to a large extent a dead letter; that during the last twelve years at least fifty-three epidemics of typhoid fever, seventeen of scarlatina, and twelve of diphtheria have been due to the drinking of infected milk alone, causing suffering and misery to some thousands of people, and killing nearly 600 persons. We need not say we fully sympathise with the objects of the memorial. The preservation of milk from infection has so obvious a relation to the health of human beings that the taking of precautions against the possibility of infection should undoubtedly be vested in those who are guardians of the public health.—*Lancet.*

The Empire Theatre, Leicester-square.

This new theatre, which occupies the site of the old Saville House in Leicester-square, is to be opened on Monday next. The building was formerly called the Pandora, and was erected from the designs of Mr. Thomas Varty, but never opened. We gave a description of the building a year ago (see *Builder*, March 3, 1883), and may now add that the scagliola enrichments are by Messrs. Bellman & Ivey, of Wigmore-street. The balustrade to principal stairs from main entrance is very handsome and massive, with capping in Genoa green, red Devonshire die, and brown Belgian base and plinth. This is continued up the stairs from dress-circle to foyer as a dado to same section and columns, and is repeated round the foyer. The foyer has an enriched domed ceiling by Jackson & Sons. This comes down on a moulded and polished entablature of scagliola in Castell and red Devon. Supporting this entablature are twelve columns of red Devon in pairs, with enriched capitals and trusses over moulded bases and plinths of Castell.

Cyanite.—This material for coating wood as a preservative against fire, which was brought before the notice of the Society of Arts some little time back, seems likely to prove of some value in that respect. It was the subject of an experiment on rather a large scale at Whitehall-place the week before last, when some wooden structures coated with the material were fired, and showed very satisfactory results. Experiments upon smaller specimens of cyanited wood we have found to vary rather in their results; sometimes the wood would burn after considerable immersion in flame, but it always showed a considerable power of resisting combustion. A point in favour of the method is that the cyanite sinks into the substance of the wood, instead of forming a mere coating. As to how long the saturated wood will retain its fire-resisting properties, we yet want the only reliable means of proof, —time.

Dulwich College.—A correspondent of the *Metropolitan* says that it is contemplated to set apart about 70 acres of the college land, in the centre of Dulwich village, and just within the limit of the London four-mile cab radius, for a public park and recreation ground for the free use and enjoyment of the public forever. There may be difficulty under the scheme in the gratuitous grant of this enormous boon, but there is little doubt that the Metropolitan Board of Works will step in, and, at a nominal cost, acquire the land for so laudable a purpose. Metropolitan ratepayers may reasonably expect the Board to co-operate with the Estate Governors in providing another open space for the rapidly increasing population of South London.

Overhead Wires.—From a report to the Chelsea Vestry by Mr. Crossop, chairman of the Electric Lighting Committee, and Mr. Staiton, C.E., Surveyor to the Vestry, we learn that the advisers to the Chelsea Vestry are prepared to recommend the limited use of overhead wires for telephonic and telegraphic purposes. They urge that the difference of cost 350l. per mile for underground laying, as against 10l. per mile for overhead laying, is too serious a point, commercially, to be entirely ignored.

British Archaeological Association.—At the meeting of this association, on the 2nd inst., the chair was occupied by Mr. Thos. Morgan, F.S.A. On the motion of Mr. G. R. Wright, F.S.A., seconded by the Chairman, a vote of condolence with the Queen and the Royal Family on the death of the Duke of Albany was unanimously agreed to. Mr. Loftus Brook, F.S.A., described a large number of examples of black Greek and Etruscan pottery, without patterns, remarkable for the beauty of their forms. The Rev. S. M. Mayhew exhibited a fine series of articles of early date found in recent excavations in the City. Among these were some remarkable Norman jugs, in perfect condition, found on part of the site of the priory of the Holy Trinity, Aldgate, a site which has hitherto been less opened of late years than almost any other part of London. An encaustic tiling was also found, of fourteenth-century date, and a boss modelled in hard cement of the sixteenth century, a relic doubtless of some domestic building erected on the site after the dissolution. It contains the device of an eagle pecking at a skull. A paper was then read in part on "Tenby and St. David's," by the Rev. S. M. Mayhew, the subject having reference to the locality to be visited during the coming congress. The Flemish settlements here by Archbishop Bealwin, were graphically described, but the completion of the paper was deferred owing to the illness of the author. A paper was then read by Mr. W. de Gray Birch, F.S.A., in the absence of its author, Mr. C. C. Smith, F.S.A., on the "Embankment of rivers," &c., in Roman times, with special reference to the Thames.

London Water Supply.—Last week a conference of the representatives of the local authorities outside the City of London, bodies presenting at least nine-tenths of the inhabitants of the metropolis, assembled at the Kensington Town-hall, to consider the measures which could be taken to protect the public against the unjust charges of the water companies. Dr. Richardson presided. A long discussion arose on a motion stating that in the opinion of the Conference it is imperative that the question of the water supply should be dealt with this year, and calling on the Government, as the only authority that can deal with it to come to the rescue of the metropolis in this matter without further delay. It was urged that this was not a practical resolution, and eventually it was negatived; when Mr. W. de Gray Birch, moved that the local authorities should be requested to give their support to Mr. Torrens's Bill. Mr. Morton, of Wandsworth, seconded this as a practical means of giving the ratepayers immediate relief from the exactions of the water companies. Mr. de Gray Birch proposed an amendment to the effect that "in the words should be introduced into the Bill to secure the application of the principle of net annual rateable value" to the assessments of the water companies, and to make the rateable value of the local authorities the proof of the rateable value of the houses supplied with water. It was agreed eventually to support Mr. Torrens's measure, with an expression of opinion that the "net annual rateable value" assessments should be decided by the rateable value.

The Housing of the Poor in Glasgow.—At a meeting of the Glasgow Town Council on the 4th inst. Mr. Shaw said it was well known that a Royal Commission had been appointed to inquire into the housing of the poor. It was understood they were taking evidence in Glasgow, and he thought that Glasgow should have some representation in regard to this important question. He gave notice that at the next meeting he should move that the members of the Committee of the City Improvement Trust and Mr. Carrick be appointed to lay up a formal report regarding the working of the scheme in Glasgow.

New Laundry, Paddington Workhouse.—At the meeting of the Board of Guardians on the 2nd inst. the Laundry Building Committee recommended that Mr. Harston be asked to prepare plans in accordance with the terms of his letter of the 13th ult. This was agreed to.

The Reichstag Building at Berlin.—It was intended to lay the foundation-stone on the 1st of May, that day being the thirtieth anniversary of the peace of Frankfurt. It is yet finally decided whether the occasion should be one of great ceremonial importance.

Opening of a New Station on the South-Western Railway.—The Earlsfield Station, situated between Clapham Junction and Wimbledon, was last week opened for traffic. It is intended to serve a new locality in the neighbourhood of Garrett-lane, where building has for some time past been going forward at a rapid rate, and where there is now a large population. The opening of the station is in connexion with the doubling of the company's main line between Clapham Junction and Wimbledon, which has been in progress during the last three years, and is now completed. From a short distance south of Clapham Junction to near Wandsworth Prison the line is in cutting, and thence runs on an embankment to a short distance from Wimbledon, when it again proceeds through a cutting. The line crosses Garrett-lane at a considerable elevation. The original bridge, which carried it over this roadway, was a brick structure, the abutments of which limited the carriage way under it to less than 20 ft. in width. This bridge has been taken down, and replaced by two iron girder bridges, which now carry the four lines, the carriage-way in Garrett-lane being doubled in width. A short distance further on, in the direction of Wimbledon, a costly iron girder bridge has been constructed over the River Wand. Nearer Wimbledon, again, the old line crossed the Merton and Wandsworth high road on the level. In the carrying out of the new works this road has been diverted, and the railway, as widened, now passes under it. The booking-offices, waiting-rooms, and the various other offices are on the north side, the south or down platform being reached by an arched passenger-way, lined with white enamelled brick, beneath the railway. The whole of the station buildings have been carried out by Messrs. Perry & Co., of Bow, under the superintendence of Mr. Jacob, the company's engineer. The probability is that there will be a large traffic to and from the station in consequence of the great rate at which building is proceeding both in Earlsfield and Garrett Park, which immediately adjoins it. On the last-named estate several new streets have been laid out, and upwards of 400 houses have been erected.

Enlargement of Covent Garden Flower Market.—A few years ago the Duke of Bedford made considerable additions to the wholesale flower market at Covent Garden by the erection of spacious new buildings having their principal elevation and entrance in Wellington-street. Notwithstanding that the increased space which these new buildings provided was more than double the previous area, it appears that the market is still too small for the wholesale flower trade, and it is about to be further enlarged by the erection of additional new buildings, which will almost double its present area. For this purpose several houses and business premises on the north side of Tavistock-street are at present in course of demolition to clear the site for the intended new market buildings. The enlarged market will have a frontage to Tavistock-street of about 100 ft. in length, mainly uniform with the existing Wellington-street elevation, Messrs. Findlater's premises at the angle of the two streets alone interposing between the continuation of the two frontages.

Value of Building Sites near the Victoria Docks.—There appears at present to be an active demand for building sites for the erection of cottage property in the neighbourhood of the Victoria Docks. Last week Messrs. Baker & Sons offered for sale at the Swan Hotel, Stratford, 111 plots of freehold building land, being the first portion of the property known as the Victoria Docks Estate, belonging to the National Standard Land Company. It was stated that the property is situated within five minutes' walk of the Custom House Station of the Great Eastern Railway. There was a very numerous attendance of buyers at the sale. Of the entire 111 lots submitted, fourteen were shop lots, and these were all sold at prices ranging from 100l. to 120l. each. The whole of the cottage sites also found purchasers at prices varying from 30l. to 40l. each. The entire proceeds of the sale amounted to a little more than 5,000l.

Female School of Art, 43, Queens-square, W.C.—The following City companies have contributed towards the "Extension Fund" of this school:—The Drapers', 25l.; the Clothworkers', 100l.; the Skinners', 105l.

Improvements in Bouverie-street, Fleet-street.—The widening of Bouverie-street at its junction with Fleet-street is about to be carried out by the Corporation. The improvement involves the taking down of the premises on the west side at the corner of Fleet-street and Bouverie-street, and these are now in course of demolition preparatory to the improvement being effected. The removal of these premises will admit of Bouverie-street, at the Fleet-street end, being widened so as to secure a carriage-way of about 20 ft. in width, instead of 8 ft. as at present, with footpaths of proportionate width on each side. The improvement will thus give direct carriage access from Fleet-street to the Thames Embankment, and one of the new streets which the Corporation have just formed between Tudor-street and the Embankment. It may be added that the proprietors of the *Daily News* are now erecting enlarged buildings on the site of their old premises on the east side of Bouverie-street, which are at present in course of demolition, as well as adjoining premises, which have been purchased for the extensions. The new buildings will have a frontage to Bouverie-street of upwards of 100 ft. in length. Mr. T. Chatfield Clarke is, we believe, the architect.

Alhambra Theatre.—This theatre, which has been closed for alterations and additions for the last three weeks, is to re-open on Saturday next. The principal alterations which have been made have been the construction of a new and broader staircase in concrete to give access to the dress-circle and first tier of boxes, and a new entrance to the pit stalls. The screens on either side of the proscenium have been removed and the opening increased to a clear width of 38 ft. Messrs. J. Shoolbred & Co. were selected after competition to be the contractors, and they have carried out the whole of the works, constructional and decorative, under the superintendence of Messrs. Perry & Reed, the architects to the Company.

The Accident Insurance Company.—After an association with 7, Bank-buildings, Lothbury, for over thirty-five years, the business of the Accident Insurance Company, in consequence of the expiration of the old lease, and the desirability of obtaining more expanding room, has been removed to St. Swithin's House, 10, St. Swithin's lane, which has recently been built by Mr. William Brass, from the designs of Mr. W. Wimble, architect.

TENDERS.

For shops for Messrs. Sagar, at Blackburn. Messrs. Myers, Vevers, & Myers, architects, Preston and Westminster. Quantities by the architects:—	
George Fielding & Sons, Blackburn	£9,609 1 4
John Wainman, Preston	7,073 8 10
Robert Brownley, Chorley	5,520 6 0
James Parker, Daisyfield, near Blackburn	6,227 5 0
W. Stone & Sons, Blackburn	6,100 0 0
William Ramsbottom & Son, Accrington	6,080 0 0
Robert Ibbotson, Blackburn	5,902 10 0
James Whitaker, Blackburn	5,759 0 0
George Keeley, Blackburn	5,729 0 0
John Livesey, Blackburn	5,686 0 0
Kenyon & Moulding, Blackburn	5,662 0 0
W. & T. Arkwright, Blackburn	5,600 0 0
Thomas Higson & Sons, Blackburn	5,585 0 0
Thomas Craven, Blackburn	5,459 0 0
James Byrom, jun., Blackburn	5,387 13 0
Accepted.	

For additions and alterations, Nos. 3, 4, 5, and 6, Wilton-road, Pimlico. Mr. George Edwards, architect. Quantities by Mr. Henry Lovegrove:—	
Green	£1,696 0 0
Reading	1,688 0 0
Nightingale	1,580 0 0
Schreiber & Co.	1,469 0 0
Martin, Wells, & Co.	1,360 0 0
Scharen & Williams	1,280 0 0
Stimpson & Co. (accepted)	1,250 0 0

For the erection of stable and coachhouse at Hampstead. Messrs. Tunley & Co., architects. Quantities by Mr. Henry Lovegrove:—

		With Extra Room.
Sesby & Son	£299	2308
Burford & Son	870	907
Tarrant & Son	856	887
Holliday & Greenwood	856	877
Outwater & Son	814	843

For Sibley Brewery, new malting, &c.:—	
Donnet & Igle, Nottingham	£2,145 0 0
Wright & Co., Leicester	2,128 0 0
Hewitt, Leicester	1,774 0 0
Bass, Leicester	1,772 0 0
Black, Barrow	1,720 0 0

For alterations, &c., to four houses, Muswell-road, Hornsey, for Mr. Sydney Smith. Mr. J. W. Stevens, architect and surveyor, 1, Dyers'-buildings, Holborn:—	
Street	£120 15 0
Carter & Son (accepted)	51 6 0

For new wing and alterations at Frogmal Rise, Hampstead (first section). Mr. Marshall N. Inman, architect, No. 7, Bedford-row:—
 G. Lamb £790 0 0
 Beatead & Sons 629 0 0
 Simpson & Son 621 0 0
 W. Bayers (accepted) 577 0 0

For alterations to Morgan's Farm, Elm, near Frome, for Mr. Wm. Strachey:—
 J. Bird, Radstock (accepted) £268 16 0

For new offices at Radstock, Somerset, for Messrs. P. Bird & Co.:—
 J. Bird (accepted) £380 0 0

For the erection of four shops in the Woodford-road, Forest Gate, Essex, for Mr. John Jones. Mr. James F. Wesley, architect, Romford-road, Forest Gate:—
 Dyer & Sons £2,388 0 0
 J. H. Johnson 2,937 0 0
 M. A. Palmer & Sons 2,573 0 0
 W. Shornum 2,959 0 0
 S. L. Stone 2,651 0 0
 J. A. Taylor 2,550 0 0
 J. Holland 2,496 0 0
 A. Nichols 2,360 0 0
 W. Bancy (accepted) 2,360 0 0

For the erection of new offices, &c., at Oak-lane, Limehouse, for Messrs. G. Hendry & Co. Mr. James F. Wesley, architect:—
 J. H. Johnson £425 0 0
 J. Holland 398 0 0
 M. A. Palmer & Sons 389 10 0
 J. Walker 389 0 0
 S. Salt 374 0 0
 E. E. Reed (accepted) 345 0 0

For the restoration of Kinnersley Church, Salop. Mr. Joseph Farmer, architect:—
 Paterson & Sons, Wellington £617 17 6
 C. T. Smith, Broseley 587 0 0
 E. Whittingham, Newport 558 0 0
 R. Yates, Shifnal 470 0 0
 Parker 429 0 0

For house at Chelsea. Mr. W. H. Seth-Smith, architect, 48, Lincoln's Inn-fields. Quantities by Mr. John Leaning, Poultry:—

	Old Materials.
Tongue	£3,362
Tarrant & Son	3,170
Read	3,105
Marriage	3,120
Hughes & Davis	3,019
E. Good	2,940

For West Cliff Church, Whitby, including oak seating. Mr. R. J. Johnson, architect, Newcastle:—

Simpson & Malone, Hull	£19,626 16 6
J. White, Whitby	19,618 4 6
J. Johnson & Sons, Middlesbrough	16,748 9 0
W. Langdale & Sons, Whitby	17,518 7 0
J. Kyle, Barnard Castle	16,803 17 4
J. & W. Bunland, Bradford	16,768 0 0
R. Sanderson, Durham	19,184 0 0
J. Bentley, Leeds	15,783 2 11
W. Scott & Son, Sunderland	15,653 0 8
R. Brown, Whitby	15,039 12 3
S. B. Burton, Newcastle	14,606 0 0
J. H. Thorpe, Leeds	14,593 5 0
T. Wood, Pickering	14,393 5 0
W. Hodgson, Malton	14,083 18 6
J. Padbury & Sons, Scarborough	13,937 10 7
S. Clark, Parkstone	13,673 0 6

Exclusive of Oak Seating.
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 T. Dickinson, Saltburn 13,439 0 0
 * Accepted.

For the erection of two houses in Grove-road, and one in Bridge-road, Grays Thurrock, Essex, for Mr. Jas. Seabrook. Mr. E. Clerk Allan, architect, Romford:—
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Nowell & Robson (accepted)	1,298 0 0

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 Bargman £498 0 0
 Buller 450 0 0
 Smith & Barnes 933 0 0
 Emmett 227 10 0

Accepted for the erection of the new Town-hall and Post-office, Kirkwall, N.B.:—
 Samuel Baikie, Kirkwall £3,993 0 0

For the restoration of Great Yeldham Church. Mr. Fred. Chancellor, architect, Chelmsford:—

	Extra for Oak Roof to Save.
Grimwood & Son	£1,061 10
Brown & Co.	1,450 0 0
Mason & Son	1,055 0 0
Leitch	1,025 6
Grimes	970 9

For proposed detached villa, Bowes-road, for Mr. A. D. Fraser. Mr. J. W. Stevens, architect and surveyor, 1, Dyers-buildings, Holborn:—

Holt & Garlick	£2,649 19 7
Knight	1,430 0 0
Brown & Co.	1,339 0 0
T. W. Smith & Son	1,300 0 0
Newby	1,273 0 0
Fairhead	1,265 16 8
Life	1,249 0 0
Tibbatts (too late)	1,150 0 0
Pryor	1,150 0 0
Kerry	1,147 0 0
Heud	1,001 0 0
Johnston	1,001 0 0

For the enlargement of Archdeacon Cambridge's Schools, Twickenham. Messrs. George Lansdown & Harries, architects, Warwick-street, Charing-cross:—

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H. & E. Lea	1,627 0 0
Wm. Collings	1,620 0 0
F. Sims	1,575 0 0
J. & P. Hermon	1,550 0 0
W. R. Wood	1,467 0 0

For painting and repairs to house at Deumark-hill. Messrs. George Lansdown & Harries, architects:—
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 Hall, Bedall, & Co. 288 0 0
 H. & E. Lea 252 0 0

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The Builder.

VOL. XLVI. No. 2160.

SATURDAY, APRIL 10, 1884.

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House Sanitation.



NOTWITHSTANDING all the improvements that have been effected in matters relating to sanitation during the last twenty-five years, there is probably no other subject upon which so much money has been uselessly expended through imperfect knowledge. From the main drainage scheme of the metropolis upon which millions were spent, and which, according to the most trustworthy recent opinions, was foredoomed soon to become inadequate to the work which it has to do, down to the simplest drainage arrangements of a small house, the instances have been very few,—so few as to form the exceptions which prove the rule,—where expensive alterations from the original plan have not been rendered necessary.

Originally, no doubt, mistakes were made through ignorance of the general principles of sanitary science, but since these principles have become known and acted upon, far more faults have been committed and injury done through want of knowledge of the practical details involved in carrying out the principles. And this will inevitably continue to be the case until the local authorities make up their minds that an official investigation of all sanitary appliances inside a house is a far more important matter than the mere casual inspection of the junction of the house-drains with the main sewer. The health of the community is the health of the individuals composing the community, and this depends to a very large extent upon the sanitary condition of the interior of the dwellings in which they live, and if this be bad the most perfect system of main sewerage will be useless to prevent disease. Many of the American and Colonial cities are far in advance of us in this respect; for instance, in 1881 the Legislature of Illinois passed a law making it compulsory that all plumbers or persons interested in contracts for plumbing work should receive a written certificate from the Health Commissioners before commencing any work, and after completion should not cover it up until it had been inspected by the Commissioners. Towards the end of the same year it is recorded that a plumber in Washington was fined 25 dols. for not ventilating a soil-pipe. In Philadelphia

a recommendation has been made to the Council within the last two months that all master plumbers should be registered and licensed by a Board consisting of the chief Engineer and Surveyor, the Engineer of the Water Department, and a member of the Board of Health, who must be a physician. Every householder and every architect who has had experience of the wretched way in which, with some honourable exceptions, plumbers' work is habitually done in this country must devoutly wish that some such regulation existed here. It is true that there are now a number of sanitary engineers ready to carry out all drainage requirements in the most approved manner; but, as a rule, "sanitary engineer" is but old "plumber" writ large, and without the closest supervision there is no guarantee that the details of the work will be thoroughly looked after.

Among the ablest and most experienced of the honourable exceptions above alluded to is Mr. Stevens Hellyer, who seven years ago gave the world the benefit of his experience in his work on "Sanitation," the new and revised edition of which is now before us.* This work, in its earlier editions, has already become widely known as the best treatise existing on practical plumbing, and this new edition has been much enlarged, and entirely re-arranged. The additions which were printed in the second edition as an appendix to the first have now been incorporated into the body of the work, and thus appear in their proper place, and the illustrations are more numerous, several of the new ones being most instructive. The first principle of the new science of house sanitation was ventilation of pipes and drains, and this has been so incessantly dinned into the ears of the public, that they are by this time fully convinced of the necessity of it,—so fully, indeed, that even the speculating builder, who runs up the endless rows of suburban "villas," has been compelled to carry up a so-called ventilator to his soil-pipe, though it is generally absurdly inadequate for this purpose. But the second great principle, viz., the proper trapping of all pipes, has not yet become so fully recognised, and we think Mr. Hellyer has done perfectly right to dwell very fully indeed upon this subject of traps, and to show clearly what are the right and the wrong kinds of traps to use. We recollect not very long ago hearing more than one eminent architect state publicly that they could not see the necessity of trapping scullery

and bath wastes which discharged into the open air. But experience has shown conclusively that whatever care may be taken in flushing out such pipes, it is impossible to prevent accumulations upon their sides, which speedily become foul, and contaminate the air passing through them; and the greater length of such waste-pipes, the worse will they become, so that the traps should always be placed as close as possible to the sink or bath, as the case may be.

One of the most important principles which Mr. Hellyer insists upon is the desirability of keeping all traps as small as possible consistent with the work they have to do. And this applies to the drains and pipes themselves as well as to the traps; the same body of water will have far greater flushing power in a 4-in. than in a 6-in. drain. In this connexion we were rather curious to see what Mr. Hellyer might have to say in his new edition as to one of his own inventions, which was probably at one time a favourite bantering of his, for it occupied the post of honour as an illustration on the cover of his previous edition. We refer to the triple dip-trap (p. 62), which certainly has a very enticing look about it, but which always struck us as being defective, in that the second chamber would not be easily cleansed. We are extremely glad to find that Mr. Hellyer has come to the same conclusion, and states frankly that he now condemns this trap as "unfit for use." Considerable difference of opinion existed at one time as to the precise value of the water-seal of an ordinary trap in excluding noxious gases from a house, and the first advocates of ventilation and disconnection were so fully impressed with their necessity that they somewhat unduly discountenanced the idea that a trap could exclude sewer-gas under pressure. The question could only be settled by experiment; and Mr. Hellyer describes a very interesting apparatus devised by himself, by means of which he claims to have proved conclusively that a water-seal of 1½ in. is capable of resisting the passage of gas at considerable pressure. Mr. Hellyer, of course, would not rely upon traps without ventilation; but his point is,—and we think he makes it good,—that without traps you run the risk of introducing into a house foul air that would be much better kept out, and that can be kept out by the use of traps. It has been known for some time that all traps are liable to syphonage unless they are properly ventilated, and one of the most instructive chapters in this book is that in which the best plan of ventilating traps is discussed. This syphonage would not do much harm if caused only by the discharge of water through the trap itself, as there would generally be sufficient drain of water to re-seal

* "The Plumber and Sanitary House. A Practical Treatise on the Principles of Internal Plumbing Work and the best Means for excluding noxious Gases from our Houses." By R. Stevens Hellyer, author of "Lectures on Sanitary Plumbing." Third edition. London: B. T. Batsford.

the trap; but if it is caused by the sudden discharge of water through a branch pipe, no such re-sealing can take place, and therefore this is the special risk to be guarded against. Mr. Hellyer carried out a large number of experiments in order to ascertain the precise effect of ventilating the traps, and he gives details of no fewer than eighty-five of these experiments, and also illustrates them very clearly by excellent diagrams. The general results of these experiments show that if several closets or other fittings are connected by branches with a long length of main pipe, the traps upon the various branches will not retain their seal unless ventilated by a pipe on their outgo side, which pipe must not be too small, and should be carried up and branched into the main pipe at a point higher than the junction of the highest branch. This method is more effectual in preventing syphonage than if the pipe is taken out into the air separately.

It would take too long to follow Mr. Hellyer into the detailed description which he gives of the various water-closet apparatus now in use. His remarks are always practical, and he appears to us to be very fair, for, although he naturally has a predilection for his own inventions, he never condemns anything without giving his reasons fully. We are very glad to find his remarks upon water-closet seats, for anything more idiotic than the way in which these are generally made it would be difficult to find. If the cost of a flap were expended upon hinging the seat, an enormous deal of trouble would be spared. But it is not the fittings alone of water-closets that are at fault; in too many cases the entire construction of the rooms is eminently unsanitary. They are nearly always too small, and sufficient care is not taken to prevent smell from passing into other rooms, and above all the windows are not large enough. By a curious sort of perversity those rooms in a house which require the freest circulation of fresh air invariably have the smallest window openings, as if the builder thought it necessary that the location of these places should be apparent to every one outside the house as well as inside. Mr. Hellyer has some very apposite remarks upon these points, but we cannot help thinking he might slightly improve the plan which he gives to illustrate his views. At page 236 is shown a water-closet in which the partition between it and the lobby is made good to the centre mullion of a two-light window, half of which lights the lobby and half the water-closet. Now, this is an arrangement which should never be resorted to unless it is absolutely unavoidable. In the case in question there is certainly no necessity for it, and if the lobby were not shut off from the staircase it would be most objectionable, but even as it is, and under all circumstances, we prefer a perfectly separate window to the water-closet. We admit this is rather a small point for criticism, but Mr. Hellyer's book is so good, and the illustrations will be looked upon as typical of what is the best arrangement to be adopted, that we have thought it worth while to notice a little matter like this, which is capable of being misunderstood by any one not thoroughly accustomed to read plans.

We have not space to follow Mr. Hellyer into the details of his arrangements for keeping bath-rooms, lavatories, sculleries, and all parts of a house in a thoroughly pure and sanitary condition, but we must notice one very great improvement, which is illustrated for the first time in this edition,—in the construction of a grease-trap for scullery sinks. This problem of dealing with greasy water is really, in a small way, one of the most difficult of solution. If the grease-collecting tank is too large, the accumulations speedily become very offensive, so that on principle we much prefer a small one; but, on the other hand, the actual operation of cleaning out such a tank is so disagreeable that servants will put it off as long as possible. Mr. Hellyer seems to have got over this difficulty by keeping the inlet and outlet pipes quite clear of the chamber itself, in which is inserted a perforated tray with two long handles by which it can be lifted out without any inconvenience as often as is required, the water flowing through the perforations and leaving the congealed grease

in the tray. Another good feature of this grease-trap is that the whole can be easily got at for the purpose of thoroughly cleansing.

Mr. Hellyer follows his description of traps and waste pipes with two chapters on water storage and supply, in which he speaks strongly, but not at all too strongly, of the absurd regulations of the water companies in not allowing water-waste preventers of a greater capacity than two gallons. He also shows by some excellent illustrations new to this edition how cistern-water becomes contaminated by bad arrangements and bad workmanship. Details follow of an exhaustive series of experiments with ventilating cowls, as the result of which Mr. Hellyer awards the palm to a rival manufacturer, and the book concludes with a chapter of excellent advice to workmen. In the preface to the new edition it is stated that "no detail has been considered too small to dwell upon," and we do not think we can give higher praise to the work than by expressing our conviction that the statement is perfectly warranted. The only persons who are likely to complain of Mr. Hellyer are the purchasers of the former editions, to which the new one is so superior that they will be compelled to add it to their libraries.

ENGLISH FORESTRY, THE COMING EXHIBITION, AND THE USE OF WOOD IN BUILDING.

THE Forestry Exhibition which is to be held in Scotland during the ensuing summer has a strong claim on public support. The subject is one that touches the national welfare in many points. The rapid development of mineral industry that has been fostered by the steam-engine has led us to treat the vegetable world of the island with blind ingratitude. English oak, of course, is no longer guarded and cultivated (as English yew was in Tudor times) as the special gift of nature on which depended the excellence of the English navy, and thus the inviolability of the English soil. The demand for quicker-growing and less precious timber, for the purpose of fuel, has been superseded by the cheap winning of coal. The neglect in question is not peculiar to the British islands. And it is probable that it is to the non-commercial element of parks, ornamental woods, and similar preserves of timber, that we owe our escape hitherto from the desolating Nemesis that has elsewhere attended on the violation of the homes of the sylvan gods. To the poetic fancy, says a modern writer, the very word "forest" recalls the scene of some legendary drama. A dreamy languor, such as that which the cool shade of lofty trees causes to the senses, steals over the mind with the thoughts of the green canopy spread by the young leaves of the beech, the solemn shadow of the pine woods, the dark and scented obscurity of the orange grove. The fairy folk keep their last hold on our fancy, and the ruder gnomes of our German kinsmen yet hold their own against the schoolmaster and the needle-gun, under the shade of ancient trees.

The amount of vegetable produce now annually imported into England is more than double that produced by the soil. To say nothing of the tropical or sub-tropical vegetable products,—cork, dye-woods, oils, resins, gums; nothing of sugar, spices, tea, coffee, cocoa; nothing of cotton and grasses, of hemp and flax, of indigo, madder, and fruits,—we import sawn or split timber, staves, and mahogany to the value of 15,000,000. per annum, of which the one item that we could not ourselves produce, mahogany, stands for under 400,000. Our imports of timber not sawn and split, down to 1868 (the last year in which they figure in the "Statistical Abstract"), stood steadily for some years at about 5,000,000. in value. We look in vain for any corresponding item among our exports.

Our colonies supply us with much timber better suited for many of the purposes of the wheelwright, the carriage and wagon builder, the cabinet-maker, and the upholsterer than our own soil can rear. As to the ship-builder,

wood is for him a thing of the past. And iron, even before it has driven wood from the yards of the shipbuilder, is in its turn being displaced by steel. The teak and the sal of the East Indies, the mora and the greenheart of British Guiana, the iron-bark and many other of the gum-trees of Australia, are all stronger than British oak, in resistance both to breaking and to crushing weight. In 1867 the Science and Art Department published a series of experiments made by the late Captain Fowke, R.E., on upwards of 600 kinds of British, Colonial, and other woods. The range displayed in physical qualities is extraordinary, and is such as to intimate how wide is the field as yet unexplored by the worker in wood. The dedoaf tha, from East India, has a specific gravity of 0.260, which is only 0.010 more than that of cork. The ironwood of Jamaica is nearly five times as heavy, having a specific gravity of 1.254. A weight of 4,256 lb. breaks, and one of 4,280 lb. crushes, oak (the pieces experimented on being each 2 in. square and 16 in. long), while the breaking weight or the iron-bark is 11,168 lb., and the crushing weight, 13,349 lb. In the present style of house-building these colonial woods ought to be well known and freely used by the builder.

The extent to which the timber crops of the United Kingdom have been neglected in recent times is remarkable, as compared with the former state of things, and is certainly not without its serious consequences. In Ireland, for instance, there is no feature of the landscape more characteristic than the desolate baldness of the hills. The barrenness in this respect is, however, of recent origin, and is but an example of that gross neglect of this great source of national wealth which is by no means peculiar to Ireland. In the bogs are found quantities of large timber, generally fir, birch, and oak, the former so impregnated with resin that a splinter burns like a candle. From the early histories of Ireland it appears that the country was formerly remarkable for the extent of its forests. Out of a total area of nearly 21 million acres the woods and copses of Ireland now are less than 330,000 acres. In Great Britain, out of nearly 57 million acres, 2½ millions are now thus returned.

The forests of Europe are estimated to cover 500 millions of acres, or nearly 20 per cent. of the surface of the continent. In British North America there are said to be 900 millions of acres of forest, in the United States 560 millions, in South America 700 millions. The total thus estimated for Europe and America alone is equal to 3,600,000 geographical miles, each containing 736 English acres. It is interesting to compare this area, so far as the possible supply of fuel is concerned, with that of the coal-fields of the world, which is estimated at 134,000 geographical miles. Of this area one-twenty-fifth part is in the United Kingdom, or 5,360 geographical miles of forest, against 5,000 geographical miles of coal-fields in full work. Four-fifths of the known coal-measures lie within British and American territory, the forests of Europe and America covering twenty-seven times the area of the known coal-measures of the world.

In Baden, where the forest statistics are carefully prepared, the annual production of wood is less than the weight of hay that can be grown on an equal area. At that rate,—which is low for an average,—each geographical mile of forest will yield, one with another, 1,500 loads of timber per annum. But a square mile of coal-measure yields something like 20,000 tons in the year. The latter produce, however, is limited and exhaustible. Extract the coal, and not only is there an end of the fuel, but the soil itself is generally reduced to utter waste. Arrange the forest according to the best theories of forestry, and its yield is perpetual.

Hanover is the European country in which scientific forestry is now probably in the most advanced condition. A forest, under the most perfect regulation, is divided as nearly as possible into six equal areas, one full of trees not exceeding 20 years in age, a second containing trees from 20 to 40 years old, and so on. In the latest block, containing trees of

from 100 to 120 years old, felling is commenced, the old trees being carefully and successively removed, and care taken, at the same time, to replace them by the growth of seedlings. It is thus endeavoured to preserve, as far as possible, the features of the natural growth of a wild forest, and, at the same time, to extract a definite and calculated harvest of wood from the soil.

Under English rule, on the other hand, according to no less an authority than Sir J. Hooker, "apathy, or at least inaction, everywhere prevails," as to the preservation of woods and forests. "The annals of almost every English colony repeat the tale of wilful, wanton waste and improvidence." In 1830, 4,000 miles of sal forests draped the feet of the Himalayas. The sal timber is almost the only wood that will resist the Indian climate, and its insect inhabitants, for railway purposes. But in 1867 the East Indian Railway Company were positively driven to import pine sleepers from Norway. In 1830, out of 66,000,000 acres, in round numbers, forming the area of New Zealand, 20,000,000 acres were under forest. In 1873 the latter had shrunk to 12,000,000 acres. If the waste were allowed to continue at the same rate, the island would be bare of timber by 1893.

Timber, as fuel, may be regarded as coming into competition with coal when the latter sells at about 17s. per ton, the timber at the same time being as low as 1½d. per foot cube. In 1874 the price of our coal was averaged at 17-29 shillings per ton, but its present value is only about 9s. 6d. per ton. That inducement to cultivate timber for fuel purposes which we must conclude likely to follow the exhaustion of the mineral store of coal and of petroleum may thus be a long way off. But the folly of neglecting our forest growth is none the less. Of all purposes to which wood can be put, perhaps the least remunerative is that of combustion. To that, it is conceivable, we must come by-and-by, but at a period of which the distance is indicated by the amount of the stores of available mineral fuel. Neither need we entertain over-anxiety as to the habitability of the planet in the time of our great-grand-children; as the now wasted powers of nature—the tidal energy, if not that of the wind, may be by that time yoked to the service of industry. However that may be, it is satisfactory to know that it is within the power of scientific forestry to secure an unfailing supply of timber by serial culture and felling.

Apart from fuel, the uses to which timber may advantageously be put are so numerous as to render scientific cultivation an important element of national wealth. Although steel has superseded timber for ship-building, the architect will usually prefer the more ancient material of construction. Especially we call attention to the value of the heavy straight-grained woods which we have previously mentioned for joists, beams, props, and similar uses. It has been stated, and we believe correctly, that beams and pillars of solid oak, such as exist in some of our old Elizabethan mansions, are far better suited to resist destruction by fire than are cast-iron girders and columns. While a quarter or half an inch of the solid log would be gradually charred, the metal would have yielded to pressure or to fracture. This advantage may be presumed to be even greater in the case of wood of higher specific gravity than oak. Passing from the construction to the finishing and decoration of the house, what material is equal, in the combination of the qualities of durability, comfort, health, beauty, and substantial excellence, to wood, for wainscots, panels, doors, staircases, balustrades, and the like? What floor is like an oak floor, or a parquetry floor? The artificial and jointed parquetry, which is supplied by some makers as a substitute for floor-cloth, here deserves attention. And in carrying out the whole idea of furnishing *en suite*, of making the fixed furniture of a room a portion of the same design as the movable furniture, nothing can compete with wood. In our knowledge of what can be produced by way of natural colour in wood, we have rather retrograded than advanced since the days of Queen Anne. Where do we now see the

lovely variety of fancy woods that adorned the drawing-rooms of our grand-parents? It was only the other day, that on removing the grimy coat with which the neglect of nearly a century had invested some articles of furniture of the nature to which we refer, a beautiful green surface was revealed, as to which no one, as far as we are aware, has yet been able to indicate the name or origin of the parent tree. Pure white, cream white, pale and dark yellows, light and dark greens, pure black, and browns of all colours, are to be found in the veneered and inlaid cabinet furniture of the last century. Woods, in fact, afford a scale for constructive polychromy, in tints sober, certainly, compared with those marble glories of which we have heard something special lately, but not without distinct value for the artistic designer.

SOCIALISM IN ART.

MR. WILLIAM MORRIS is a poet and an artist of considerable eminence, whose opinion in matters of art is always deserving of attention. Further than this, he holds an important position as an extensive employer of labour, and may reasonably be supposed to possess some knowledge of the social needs and aspirations of the class he employs. When, therefore, we find him advocating socialistic principles, we are disposed to give ear to his utterances with a feeling of interest, in which, perhaps, curiosity is predominant, and may recognise the existence of many of the evils he points out without necessarily agreeing as to the remedy to be adopted.

The attitude of Mr. Morris is somewhat anomalous. The opponents of socialism are never tired of insisting that it can find favour only among those who have everything to gain and nothing to lose,—those disappointed ones who have fallen victims in the battle for existence under the great law of the survival of the fittest, and who wish for a reconstruction of the social fabric which would enable them to thrive upon the resources of their more industrious or successful brethren. To this class of would-be reformers Mr. Morris, as a large employer of labour, is a marked exception. He would certainly lose something by the adoption of his principles, and although he has been charged with inconsistency, he is certainly free from any suspicion of self-interested motives.

The evils that Mr. Morris, and those who think with him, propose to redress, are the extreme poverty, ignorance, and consequent depravity, in which a large section of the population are known to exist. Touching pictures have been drawn by recent writers of the sad condition of the dwellings of the poor in our crowded cities, and the revolting nature of their squalid unlovely lives. We need not be suspected of closing our eyes to facts which we long ago assisted in bringing to light; but this is not all. We are told that art is absent from the life of the modern workman; that his home is necessarily bare of art, because his earnings are so precarious that he cannot afford to purchase what has now become only a luxury for the wealthy, and that, in his working hours, he can have no share in art, because, under the present competitive system, he is compelled to work by pattern, and cannot linger over his work. "But if art is not popular,"—we quote from a recent lecture by Mr. Morris,—"it is not of the people, it is an idle and worthless toy. Therefore the progress,—nay, the very existence of art,—depends on changing the basis of society." In common with those who seem to take pleasure in decrying modern art, Mr. Morris is of course ready to tell us how much better was the condition of the Mediaeval handicraftsman, who was "master of his time, free to give his whole thought and imagination to his work, and in fact an artist"; apparently forgetting that such artists were miserably underpaid for the class of work they produced, and that golden rewards are held out, under the present competitive system, for those who can but partly emulate their style of workmanship.

The competitive system,—held by political

economists to be the necessary stimulus of industrial enterprise,—is the *bête noire* of socialism. To be a landlord is a sin, but to be a capitalist and an organiser of labour is to be a species of ogre who grows fat upon the produce of the workers, to whom the means of a bare subsistence is accorded as their share of the value produced. Nor does the middle-class escape condemnation. Not in his lectures at the Birmingham and Midland Institute, where a tone comparatively moderate was preserved, but in a work, for the contents of which Mr. Morris must be held responsible,* do we meet with denunciations against a class guilty of the iniquity of being contented under existing conditions. "Here," we read (pp. 50-51), "is the last class antagonism, which, indeed, is world-wide, the antagonism between the slaves of the machine, the mere social engines for producing surplus value and contributing to luxury, against the capitalist class and their hangers on, the landlords. All other antagonisms, complicated as they were, have now faded into this one simple unmistakable hostility of clearly defined inimical interests between the proletariat and the bourgeoisie." Class rivalry is, we know, a necessary result of competition, and so long as the present system continues, there will always be found extremely contrasted conditions of poverty and wealth at opposite ends of the social scale. But while we maintain that capitalism and competition are indispensable to national prosperity, it may be interesting to glance at some of the changes advocated by modern socialists, and their probable effects upon progress in general and art in particular. With this object, we cannot do better than follow the programme sketched out in the work cited above, since it is the recognised mouthpiece of the Democratic Federation, of which Mr. Morris is the honorary treasurer.

First in order, then, the proposal for land nationalisation is, at page 57, plainly set forth. "We claim, then, the land for the people, that the soil of our country, with whatever is useful or beautiful in or upon it, should no longer be held by a small minority for their aggrandisement and greed, but that it should be owned by all for all collectively, to be occupied, cultivated, enjoyed, mined, or built over, as the majority of the people shall see fit to ordain."

Without attempting to dispute the justice of such a scheme of confiscation, we will merely inquire what would be its result upon all building enterprise. Is it not an acknowledged fact, that the bad construction and defective sanitary arrangement of many modern dwellings that go by the name of "jerry" building, is mainly due to the tenure of land upon short leases, because it is not worth any speculator's while, and, indeed, would not pay him, to erect upon leasehold ground works of the same substantial kind as are found upon freehold property? But if a man feels little interest in building upon land which he only holds for a time, he will feel no interest in building upon land which he does not hold at all, and the effect of land nationalisation would be to destroy all private enterprise in building. The duty of erecting dwellings, churches, public offices, &c., would then devolve upon the State, which could not, of course, study to meet the demands of individual fancy. Some system would have to be adopted, and perhaps we should have the felicity of seeing a national style of architecture by law established, under which every man's house must be exactly like his neighbour's, any difference in size or magnificence being opposed to the principle of social equality.

At page 58 we are informed that "Socialists have no factious prejudices, and are influenced by no jealousies of a clique. We call, therefore, also for the immediate management and ownership of the railways by the State, so that the inland communications of the country may be under the control of the people at large, and carried on for their benefit, regard being had to the full remuneration of the labour of all

* "A Summary of the Principles of Socialism." Written for the Democratic Federation, by J. M. Hyndman and William Morris. London: The Modern Press, Nos. 13 and 14, Paternoster-row, E.C.

who are engaged in the work of transport." And again, "As with railways, so with shipping. There the whole economical forms are ready, in the same way, for immediate management by the State, and the transfer could be arranged almost without a hitch. With mines, factories, and workshops, more direct interest by the workers engaged in them would be needed, but as education extends, and the habit of economical collective freedom grows, it will be as easy for the labourers to choose their own superintendents, and apply the best machinery, as it is for the capitalist to choose and use them to-day."

In the proposed State appropriation of railways and shipping, the socialists foresee the beginning, but not the end, of the revolution they wish to promote. To place the results of vast industrial enterprises, called forth by competition, under the permanent control of the State, would be to paralyse all efforts towards further improvement. The machinery of Government always moves tardily, and it is necessary to the avoidance of blunders that it should do so; but its labours would not be facilitated by an increased amount of work. It is sufficiently difficult, under the existing Patent Laws, for an inventor to utilise his ideas for the benefit of the world at large, but the difficulties would be multiplied tenfold if the command of all our engineering appliances were vested in one authority,—the State, as representing the nation. Then the ingenious inventor who desired, for example, to improve our means of transit by land or sea, would be precluded from embodying his ideas in a practical form at his own risk as capitalist,—would have, as a matter of fact, to ask the consent of the whole nation to co-operate with him, and would probably prefer selling his invention to some foreign despotic power not yet subjected to the tyranny of socialism.

With regard to mines, factories, and workshops, some difficulty seems to have been scented, as it is admitted that "more direct interest in them by the workers would be needed." Perhaps this is because the world has seen some socialistic experiments in these branches of industry, though not yet on the gigantic scale recommended. Co-operative societies of a communistic character have existed for the purposes of production, not only in this country, but in America also, and with some degree of success. Provided the persons co-operating are limited to a small number,—say fifty or sixty,—the feeling of joint interest is sufficiently strong to exercise a wholesome influence upon each unit. Every man feels that the harder he works the greater will be the common gain in which he is to participate, and an art-workman might, under such circumstances, feel some incentive to produce excellent workmanship, though we deny that the inducement would be so strong as under a free competitive system; but it is when the numbers forming such a co-operative society are increased to any large extent, that the failure of the socialistic principle becomes evident. Then the importance of individual effort appears so inappreciable that many a man will indulge in partial, if not total, idleness, feeling assured that he will never want food and shelter so long as he remains a member of the commonwealth. This introduces us again to the old objection against socialism, viz., that it provides for supporting the idle and dissolute at the cost of the sober and industrious members of society.

The objections already urged against land nationalisation apply with equal force against the State appropriation of capital advocated by the Socialists. "National banks," we are told, at page 59, "national credit establishments, State and Commercial centres of distribution for the purchase and exchange of goods, will supplant and take over the huge enterprises for the gain of a class which now exercises such enormous influence, and accumulates such vast profits under protection of the middle-class State." Without private capitalists, no private enterprise could be organised, and without private enterprise what would become of the arts and sciences? For carrying out novel inventions or great works of art, we presume Government grants would have to be obtained. At present a private capitalist can

inaugurate a great scheme at his own peril, sinking his money in the employment of labour until he meets with adequate returns. He thus employs labour at a loss for a time, during which the labourers receive more value than they produce; but no such hazardous investment of the public money would ever be allowed for forwarding schemes of doubtful efficacy. Even the artist, who lingers over his work in order to perfect it to his liking, must live in the meantime on capital in some form. At present he lives upon his own resources. Would he feel disposed to become the pensioner of the State, and would the State-directed career recommended for him by Mr. Morris be favourable to the freedom of originality, or, indeed, to any freedom at all? And how is art to be made cheaper for the benefit of the poor, unless it is to be by underpaying the artist? Our modern plutocrats, though sometimes wanting in discrimination, certainly pose as munificent patrons of art, and it is difficult to see how State control could afford it greater encouragement. Artists,—we use the term in its broadest sense, as comprising not only painters, but sculptors, architects, and others,—occasionally amass large fortunes, and their example acts as a healthy stimulus to competitive exertion on the part of others. Abolish competition, substitute socialism, and we venture to predict that art, in common with all other forms of human activity, would decline, from the lack of all encouragement to individual effort. It is idle to point to the Mediaeval handicraftsmen and their works as exceptions to the great principle of competition. At the time when these men were giving their best efforts to the world, they, as a class, were in a transitional condition; for the much-maligned middle class was then actually being formed from their ranks, as Mr. Morris has himself admitted, in the columns of a contemporary journal.*

What then, it may be asked, is to be done? Is art so expensive that the poor can have no share in it, and must it cease to be anything more than the plaything of an exclusive dilettanti? We deny that all art is necessarily expensive because its best productions command high emoluments. Beautiful forms may be given to cheap materials with as little expenditure of labour as ugly forms can; and, in fact, in the commonest articles of daily use, in simple chairs or tables, and in kitchen pottery, more and more artistic feeling is displaying itself in cheap forms, and art of some kind is within the reach of the poorer working-class, if they really care for it. If they do not, their appreciation of it, or of any other form of mental activity, is not likely to be increased by any scheme of social reform which is calculated to undermine all self-reliance and independence of character.

NOTES.

THE monument to the late Dean Stanley,—the "Dean of Westminster" *par excellence*,—which was this week placed in one of the bays in the chevet of Henry the Seventh's Chapel, is a tomb monument in the Mediaeval fashion, with a marble recumbent figure of the Dean placed upon a panelled alabaster tomb in a style in keeping with its architectural surroundings: the figure is by Mr. Boehm, the tomb designed by Mr. Pearson. The upturned face is a good likeness of that countenance which was so well known in London; that face at once eager and refined, wearing the expression of one of whom it might be said that whatever things were pure, whatever things were lovely, whatever things were of good report, he thought on those things. Many who have looked at it must have felt the contrast between that active energetic life and the repose of this effigy, sleeping beneath the subdued light of the stained-glass window. The whole is in harmony with the *genius loci*, which unhappily can hardly be said of many of the Abbey monuments, certainly not of Mr. Boehm's Lord Beaconsfield in the north transept.

Of course we do not know how far the sculptor is responsible for the choice of the ceremonial dress, little in keeping, and very weakly treated, as is the whole figure; but the countenance is full of point and characteristic expression. Unfortunately, this expression itself is painfully discordant with the associations of the place, and perhaps still more so with the garlands of primroses with which admirers have encircled the feet of the figure; it is as if sneering at the whole affair, as perhaps the original of the monument would himself have sneered; but that is no fault in the sculptor. Longfellow's bust, by Mr. Brock, which we did not mention at the time (for, after being ceremoniously unveiled, it was forthwith "laid up in a napkin" for a season), gives the idea of a man of more solid and robust qualities than that poet of quiet and delicate genius really possessed; it is a somewhat flattering bust, but treated in a broad and sculpturesque style. Nothing could be poorer in design than the pedestal or bracket on which it rests; a flimsy bit of Classicism, stuck, like a child's toy, on the rock-like surface of the great pier of the crossing.

EVERY one connected with the architectural profession, and many outside of it, will have read with great regret and sympathy the melancholy case of Proceedings in Lunacy in reference to an accomplished architect, the inheritor of a name of the highest reputation in the profession. We have not thought it any part of our duty, or consistent with good feeling or good taste, to occupy our columns with any report of proceedings painful to all concerned, and to which the daily press has given all the publicity which is necessary for safeguarding the interests of society; nor do we feel disposed to comment on a matter of which those most nearly concerned must be the best judges. We beg leave only to express our sincere sympathy with those on whom so heavy an affliction has fallen, and our hope that it may prove only of temporary duration.

WE have received from the "Society for Photographing Relics of Old London," Nos. 85 to 96 of their subjects. These include a delightful old staircase, wide, substantial, unpretending, from No. 10, Austin Friars, as well as a view of the exterior. The old Bell Inn, exterior and courtyard, furnishes two illustrations, the interior buildings towards the courtyard looking like a cloister in the rough, or a survival of an older and more massive stone architecture. The "Old House, Fore-street," stands as a silent commentator on the Fire of London, and the reasons and opportunities for that pyrotechnic display; nor, it must be confessed, has it any architectural beauty and character to atone for its very combustible constitution. A view of St. Giles's, Cripplegate, seen over the houses, serves to remind us how effective general design may be combined with very poor and feeble detail. The "Old House, Great Winchester-street," with its paved courtyard and wide hospitable-looking flight of steps up to the door, is as characteristic of the days of "Old Leisure" as anything could be; and another London characteristic is shown in the bit of green foliage clinging to the side of the old house; for it is remarkable how, in spite of fog and smoke, vegetation clings to the old streets and corners of crowded London: few streets that have not a bit green somewhere, come upon when you might least expect it. The two doorways at Laurence Pountney-hill are of a more ambitious mood of architecture, brilliant with carved jambs and brackets carrying the ends of the semi-circular stone canopies of the period. "College-street and Innholders' Hall" are in a more subdued and plain style; the door of the hall, shown separately to a larger scale, is a capital specimen of simple largeness of design; not known through any evidence to be Wren's, but looking very like him. Here in the angle of this old narrow street, too, we find the hardy London tree flourishing and overlooking the roadway. A doorway in College-hill, and some old houses in Fleet-street, one of them said to have been the residence of the author of "Polyolbion" (how many "general readers

* Justice, March 15, 1884.

know anything of "Polyolbion" now?), complete the tale of the present batch of publications, which form part of a set that every one who loves older London and its multitudinous associations ought to possess.

LORD BRABAZON, in a letter to the *Times* of Tuesday last, drew attention to the project, embodied in a private Bill now before Parliament, for a public recreation-ground for Fulham and Hammersmith. The proposed site lies between the Thames on the west and the Fulham Palace-road on the east, bordered by the Bishop's-walk on the south and Hammersmith on the north, which, with a few deductions, covers an area of some 160 acres, the freehold of which is valued at 230,000*l*. To acquire this property and lay it out for recreation it is proposed that the Metropolitan Board of Works should be empowered to raise the necessary funds at 3½ per cent. interest, which, together with the sinking fund, need not exceed 10,000*l*. a year,—in itself equal to one-tenth of a penny in the pound on the metropolitan rateable value of 30,000,000*l*, and amounting to the very small sum of 2*d*. a year to each 20*l*. householder. Lord Brabazon urges that, looking to the absolute necessity for open spaces for the health of London, municipal authorities should not wait to purchase until land, being surrounded by a dense population, has acquired a fictitious value, but should buy with a view to future requirements, and points out that America has set an example of acting on this principle. "The Central Park at New York was for many years only central in imagination, being some distance from the city. It is now contiguous to it, and, no doubt, in a few years' time its name will not be inappropriate." If the Fulham site is not acquired now, in a year or two the cost might be increased by 100,000*l*. Two-thirds of the land belongs to the Ecclesiastical Commissioners, and is hostile to the Bill. The cost is the only difficulty, except the want of statutory powers, which Parliament is now asked to supply.

MESSRS. BELHAM, of Buckingham Palace-road, have had on view at their rooms a stained-glass window, designed by Mr. J. P. Seddon for Llanbadarn Fawr Church, near Aberystwyth. The window is a five-light one, showing in the three centre lights a representation of the Transfiguration, the three Apostles below, the Christ and Prophets above, in vesica-shaped spaces, encircled with what we understand was intended as a kind of conventional indication of clouds, the only bit of the design we do not quite like, as they make ragged lines round the framework of the principal figures which are not quite pleasant to the eye. The figures have sufficient freedom of line and action without departing from the degree of conventionalism which is requisite in such a design, both in regard to the materials and the strictly defined spaces into which a mullioned window is divided. The side lights are occupied by angels with various musical instruments, including a kettle-drum, not a sort of instrument we should expect to be prominent in angelic hands; but, as Malvolio says, "there's example for it" in certain Medieval designs of the same type, which must, we suppose, be held to justify the idea. Apart from this, the window is a fine and original one in general idea and in colour; the effect is heightened (or deepened) by the peculiar thick and streaky-tinted glass employed, which is a speciality with the makers, an attempt to imitate the effect of the old thick horny glass of earlier Medieval work, where there are no spaces of absolutely crude or flat colour, but everything is shot with varying hues and tones, some of these inherent variations in the glass being even arranged so as to supply the idea of the drapery folds. The nearly white glass employed for most of the drapery of the principal figure causes it to shine out from the rest, heightening the idea of the Transfiguration.

An exhibition of work in precious stones and jewelry of all descriptions is to be held in Paris in August of this year,—an exhibition

which, if properly carried out, ought to be a most fascinating as well as an artistically instructive one. Some discussion has arisen, according to the *Gazette des Architectes*, as to the question whether the mounting of the jewels should be taken into account in judging of the merit of the exhibits, the syndicates of diamond-workers and jewellers having represented to the "Union Centrale des Arts Décoratifs" that there would be some difficulty in inducing jewellers to submit only unmounted stones. It has accordingly been decided that precious stones, gems, cameos, intaglios, or mosaics, will be accepted either mounted or unmounted, but that the mountings will not be taken into account in awarding the prizes. The exhibits will be classified as follows:—

- 1st and 2nd Groups.—Jewelry in all its applications, precious stones, and cameos.
- 3rd. Bijouterie in precious metals, and imitations.
- 4th. Goldsmith's work in its various applications.
- 5th. Artistic bronzes and imitation bronzes.
- 6th. Enamels on precious metals or cloisonnés.
- 7th. Coins and medals.
- 8th. Watches and other analogous work.
- 9th and 10th. Various objects ornamented with precious stones, and accessories of art-industry.
- 11th. Crown jewels and exhibits from the State collections.
- 12th. Special objects not coming under any of the above groups.
- 13th and 14th. Various objects to be executed before the public by workers in the various industries included in the exhibition.

We print in another column a communication of some interest, arising out of a review of a work on military architecture in our last, giving the opinion of a military authority as to the part which the architect might, and indeed ought to be invited to, take in the planning and designing of modern military structures. How many of Colonel Parnell's colleagues would subscribe to his opinions we cannot at present conjecture; but it would no doubt be satisfactory to architects to find themselves invited to a new field of labour of great interest and honour. As to Colonel Parnell's own objection to our statement that the architectural element has died out of military structures, we do not think there is anything in his description of such structures, as existing, to controvert it. That there is much stone work masked behind some earth-faced fortifications does not of necessity render them architectural in the sense in which we used the term. We alluded to the fact that ancient fortifications had, though not intentionally, a distinctly picturesque architectural element, which modern fortification works have not, and we imagine most of our readers will think the dictum only too true.

Few people unconnected with it have heard very much of the "International Exhibition" at the Crystal Palace, but it appears that there is, at all events, to be an "opening day" on Wednesday next in great form, and auguring something on an important scale. The Lord Mayor is to preside, and the members of Her Majesty's Government, as well as many Ambassadors and distinguished men, have been invited. Sir G. Macfarren has composed a cantata for the occasion, in which Mesdames Albani, Patey, and Antoinette Stirling, and Mr. Santley will take part. The exhibition will include a great variety of objects of interest; naval architecture is to be largely represented by many models of the finest examples of modern shipbuilding; but the international character of the exhibition will be most illustrated in the art department. East, West, North, and South, we are told, are to be represented; a great bronze vase from Japan will vie with a great porcelain vase from Staffordshire. Etching and engraving are to be largely illustrated, and the walls of the exhibition will be rendered further attractive by a remarkable display of the publications of the Vienna Society, the Bond-street Fine Art Society, and other art publishing agencies. It is a good while since any art, except that of music, has been really well represented at the Crystal Palace, so that we hope the promises made will be realised; though it may be thought that just at present we are becoming a rather over-exhibitioned people.

"My own romantic town," as Scott called Edinburgh, has been in a state of unusual excitement and stir this week, in the celebration of the tercentenary of its University. The streets have presented an unwonted aspect, the usual pedestrians in homely broad-cloth being interspersed with individuals in robes of black, white, scarlet, and yellow, with hoods of all the colours of the rainbow, and the collegiate trencher has had the best of it over the ordinary British hat. Alas! why cannot we be always picturesque? Every city, it is true, does not present such a scenic background as Edinburgh, and the inhabitants of the city flatter themselves that the wise men who have come from all quarters to assist at the celebration will not forget the effect of Auld Reekie as seen under these exceptionally favourable circumstances. The Edinburghers are more careful of the picturesque, too, than the natives of some other cities. They show a laudable desire to avoid spoiling their city more than can be helped; as instanced in the picturesque new houses at the Lawnmarket, designed by Mr. Marwick, to replace some old timbered houses which had to be removed owing to decay. The University is about to show its sympathy with architects by conferring on Mr. R. Rowand Anderson, the architect of the new medical class-rooms attached to the University, the degree of LL.D.

FROM an amusing article by M. Planat, in the last number of *Le Somain des Constructeurs* it seems that there is a kind of "Anti-scr Society" dispute going on about Mont Michel. The actual state of the case is too complicated for our contemporary to make out; but it appears that some people who are stigmatised as *utilitaires*, an epithet which, as M. Planat justly observes, proves nothing,—wish for a dyke from the mainland to the Mount, above the reach of high water, and that others of the archaeological purist party oppose the project on various grounds. Mixed up in the controversy are "Messieurs des Monuments Historiques," as they are irreverently termed, a certain critical "bas-Normand," and a mysterious "Société des Polders," who profess to have rights in the matter which no one understands, and which they do not define, but who obtained a gold medal in the Exposition of 1878 for a project for draining dry St. Michel Bay, between two dykes, which were to act as barriers to the sea. The defenders of the *status quo* maintain that the formation of the dyke has disturbed the foundations of the ramparts, and that great cracks are appearing in them; but no two parties can agree as to whether the appearances so named are really cracks. M. Vachon, an "anti-scraps" correspondent, after premising that "Mont St. Michel est une merveille," a statement which *Le Somain* is not disposed to contest, declares that the works that are being carried on will have disastrous effects, and that he gives one particular tower just a year to stand. On the other hand, constant communication with the main land is urged as a work of charity to the 100 inhabitants of the island, to prevent their being drowned by the tide, smothered in the mud, or dying for want of access to a doctor. As to the tide, replies M. Vachon (almost in the very terms of Dickens's engine-driver), only seven people have been drowned in crossing during sixteen years; and as to the other points, comments "le bas Normand," "faut-il beaucoup s'apitoyer sur cette mauvaise habitude qu'auraient contractée les pauvres habitants, de se noyer dans le fange?"—Sur l'absence des médecins? Plus d'un mauvais plaisant y trouverait plutôt matière à rire." But there is a further complication. The Mount has a gateway: now people used to go up from the beach to the gateway, but now they have to go down from the dyke on to the beach and up again. Then carry the dyke on to the gateway. But the gateway is lower than the dyke,—indeed, it is submerged at high tide, while the dyke is "insubmersible par destination." Then make another gateway at a higher level. "Relevez la porte! Et le style de l'époque! Et l'intégrité du monument? Et l'authen-

ticité de la porte, qu'en faites-vous? Une porte neuve, dans le mur sacro-saint du Mont! Et de quel style, s'il vous plaît, votre nouvelle porte? Les uns, conciliants, auraient concédé une porte gothique. Vraiment! disent les autres, marquois! du pastiche, toujours du pastiche! Messieurs des Monuments en ont trop usé et abusé; nous n'en voulons plus," &c. The question seems to be still unsettled; but there is a certain wicked satisfaction in finding that our neighbours are tarred with the same brush as ourselves.

THE DECORATIVE USES OF METALS.*

Of Bronze.—The treatment of bronze should be as different from that of forged iron as darkness from light. Its sombre colour, its imperishable nature, and its intrinsic value, combine to invest it with unapproachable dignity. Its sterling and enduring character fit it beyond all other substances on earth for monumental purposes. Compared to even the hardest syenites and granites, it would endure for ever, for how can these be expected to withstand the tempests of ages when carved into monuments, while we see the vast upheaved ridges of their native mountains weathered and fretted into pinnacles and aiguilles, mere shreds of their former masses, while in England we have stumps of old mountain chains, now weathered away to a few hundred feet high, which formerly gave birth to rivers and torrents equalling those that flow from the Alps? Works in bronze should always be dignified and somewhat massive in character. It is unsuitable for small objects, and its treatment should never be finicking or grotesque. For monuments and effigies it is unrivalled, and we may almost say that the only ones that have come down to us unimpaired are of bronze. No bronze effigy is defaced or has required restoring. If all our kindly effigies had been of sculptured bronze, we should be in possession of a portrait-gallery of surpassing interest, in place of the scraped and restored stones of St. Denis, or of the defaced ones of Westminster. There is far less, however, to be said in favour of bronze for internal monuments, where marble is at home, than for out-door monuments, where its superiority is absolute and incontestable. Apart from the fine examples of bronzes already mentioned, some of which, at Hildesheim and Lübeck, have braved 800 years of Baltic climate, or Trajan's column or the horses of St. Mark's, whose antiquity is reckoned in thousands of years; there is just outside Nuremberg a campo-santo in which every tomb is of bronze. They are all similar in design, and consist of a slightly curved slab with armorial bearings in relief. Some of them bear dates of the fifteenth and some of the nineteenth century, yet, except for a little stiffer treatment of the mantles in the older ones, there is nothing to distinguish the newest from the oldest. No more forcible proof of the absolutely indestructible nature of bronze when exposed to the weather could be wished than this; yet, though the only material capable of resisting London air, where is a bronze tomb to be seen in a metropolitan graveyard? What sums are lavished on the puny obelisks, the broken shafts or stereotyped urn and drapery which form the more ambitious monuments in a British cemetery, and how far superior the Nuremberg plan! If stone must be used, might it not more advantageously take the form of colonnades inclosing campo santos, the slabs and bases of the columns receiving the inscriptions? Grand effects, such as those at Pisa or Genoa, could be produced at less cost than is now expended in isolated efforts.

Our campo-santos might be appropriated to artists, to heroes, to sages, to goodly merchants, and the architecture infinitely varied. To return to bronze, however, we cannot help noticing how extremely limited in London is its use, there probably being in existence not more than some half-dozen bronze lamp-pedestals, and but few drinking-fountains, and only one pair of gates, those under the Marble Arch. Of portrait statues we have to spare, and it is to be regretted that some other form of memorial is not more frequently used in their stead. Whether sitting or standing, our nineteenth-century costume does not lend itself to statuesque dignity and repose, nor to heroic

action. It is always surprising that memories of those whose good deeds have not been national enough to deserve a public statue, are not often commemorated by less pretending memorials, such as fountains, lamp-posts, crosses, vases, tablets of bronze. We have no reproduction of the Venus de Milo, the Diana, the Apollo, or in fact of any good antiquities in London public places, yet their cost as memorials would be relatively very trifling. The Irish Celtic crosses are magnificent objects, as well as sacred emblems, and the Japanese have shown what dignity storks, pelicans, and eagles assume when treated on a colossal scale. Winged lions, lambs, angels, and many other forms are intrinsically beautiful, and have a religious significance, and are, therefore, adapted for memorial use, and would look well if raised to a sufficient height. But apart from such purposes, bronze has a high architectural value, and might be largely used for the caps and bases of granite shafts, panels, the filling in of spandrels, and occasionally for doors, and even gates and railings. It is far less expensive than is supposed, and there is abundant precedent in Italy for its use for all these purposes.

Bronze is a mixture of copper and tin, and sometimes lead, the proportions of which vary somewhat, but are usually as nine to one. It is often adulterated with zinc, but when this is the case its surface honeycombs on exposure. Although it can be chiselled into form, the only practical way is to run the molten metal into moulds prepared of sandy loam, but the surface of the rough casting can afterwards be chiselled or chased into any degree of fineness desired, and in the smaller French bronzes even the texture of the skin is reproduced. Its natural colour is a fiery red, but under our skies it rapidly tones to a deep brown. The greatly prized green and rich brown patinas are produced artificially by powder or pigments, or exposure to the smoke of burning wood, but they result naturally from slow chemical decomposition acting for a long time, according to the conditions under which they have been preserved.

Though exceedingly tough, bronze is not very malleable, and when required in plates or small rods pure copper is substituted. This also rapidly assumes a pleasing hue, generally a whitish, beryl-like green. Those who know Copenhagen must recollect the beautiful effect of the fantastic steeple, formed of twisted dolphins, entirely sheathed in copper, and the still more beautiful spires of Lübeck.

Of Cast Iron.—Cast iron should be used in exactly the same way as bronze, of which it is a cheap substitute, and it is only really artistically admissible when used, as in the facings to Westminster Bridge, on a scale that is colossal. The lamp-posts on the Thames Embankment are very favourable specimens of it, but it is questionable in so costly an undertaking whether bronze should not have had the preference, for their liability to damage and the cost of painting them from time to time will eventually reduce the original economy to nothing. The saving is, at most, the difference in the intrinsic values of the metals, the cost of moulds, &c., models being identical at the outset. Cast iron is, however, in most cases a sham that should be banished for railings, balconies, balusters, and all purposes where lightness combined with strength is required. The increasing demand has already shown that wrought work competes successfully with cast, even in more first cost, as it will ever do if designers will but bear in mind that plain and simple iron-work is more in keeping with the simple architecture of inexpensive buildings, and is in better taste than the absurdly ornate little balconettes and crestings that deface almost all our suburban terraces and cottages. Cast iron is an unnecessary sham when it essays to reproduce forms proper to wrought iron, while its brittleness should, from a utilitarian point of view, lead to its use being utterly abandoned as a substitute for smith's work. The railings to the gardens of the Thames Embankment are a case in point, for they are so broken and snapped that it was proposed at a recent Cantor lecture* before the Society of Arts to secure a panel, if one yet remained perfect, and place it in a Museum. Cast iron has its uses, but its treatment should be more solid and massive than that of bronze, and, in no case should it imitate wrought iron.

Of Brass.—Brass, from its composition, can only be used in the interior of buildings, and should not be exposed to damp. Its natural pale yellow colour is very agreeable, and is due to the presence of zinc. It is not highly malleable, but may be cast and treated like bronze, or by a process of annealing rolled into thin rods and sheets, and worked up in the same way as iron. It is difficult to give a decided preference to either method, though they are so totally opposed in principle and practice. The present tendency is in favour of wrought brass, welded, beaten, pierced, hammered, and riveted as in iron; for this exhibits the individual skill of the handicraftsman, and possesses a sentimental value that cast work, which can be reproduced *ad libitum*, cannot possess. The designs should be more severe and precise than if intended for forged iron, and more pierced and embossed work should be introduced. It should be sparingly used, and the redundancy of polished brass in some of the newest restaurants in London, though affecting to be of the quiet and unpretending style painted by Hogarth, is vulgar.

The works in ormolu of Louis XV. and Louis XVI., which are of cast and chased brass gilded, are too beautiful to afford any scope for adverse criticism, but objects designed to be cast in brass should either be of great delicacy or of great simplicity.

Though the arts of working, in at least what are called the baser metals, are not yet in the position their importance in the past and in the present entitle them to, the future is full of hope, and we may trust that a time is at hand when men of exceptional power, though engaged in what have been regarded as the humblest industries in which art can enter, will be able to impress the seal of genius on their work, and hand names down to posterity which may no more be forgotten than those of Peter Vischer of Nuremberg, Quentin Matsys of Antwerp, or Shaw of Nottingham.

OLD TOOLS.

No one can reasonably complain that the Old World has not of late been afforded very ample means of acquiring a vast amount of information respecting America. We have had placed before us a most varied series of impressions as experienced by a crowd of amateur travellers and "globe-trotters," poets, theatrical and other "stars," M.P.s, philosophers, and novelists, who have each and all freely imparted their views through the press and the circulating-libraries. In all this flood of information there has, however, been a want of a practical point of view respecting a country from which no one returns except with his eyes opened as to questions of the utmost interest, even to our venerable civilisation.

Something of this practical element may be said to be supplied by the evidence recently gathered by the delegation despatched from Paris some months since to the Boston Exhibition, and which, composed of seventeen carefully-chosen members of the more important mechanical trades followed in the French capital, has fulfilled its duties in a manner which, now that the delegates have delivered themselves of their general impressions, has brought them a vote of thanks from their fellow-workers.

The views of these "citizen delegates" despatched to America, at the expense of their fellow Parisian workers, are deserving of attention at a time when the question of American competition is placing itself before the world as a factor of growing importance. As can be imagined, the political element has not been wanting in the verbal reports of the Parisian delegates, though this may for our purpose be dismissed by the statement that the experience of the party generally showed them, in a land of promise so often held before the European workman, almost all the same industrial difficulties that exist on this side of the Atlantic, and arising from the same unsatisfactory regulation of the relations of capital and labour; the consensus of opinion tending towards the frank admission, —sincere, too, it must be remembered, coming from a source so purely "ultra,"—that the workman was, after all, better off in France, and therefore it may be said in Europe, than in the States.

Important as is this conclusion, it is to a more directly-practical point of the delegates' report that we would wish to draw attention. There

* See pp. 471, 804, ante.

* By Mr. G. H. Birch. (See *Builder*, vol. xlv., p. 532.)

is a unanimity of opinion as to the superiority of the tools used in every mechanical trade in America, their great perfection, their adaptability to the daily changing needs of commerce, the saving of hand-labour they insure, and the consequent economy in the price of production. In this direction France, it is frankly admitted, is sadly behind, not only America, but those European nations which, having entered the competitive field more recently, are supplied with more perfect machinery, and tools better fitted to supply the demands of modern commerce. The question, in fact, of the simplicity, the imperfection, of their old tools, has at length roused the attention of the French workmen. And here a further light has been thrown upon the subject by the evidence of the Commissioner despatched to America by the French Minister of Commerce with a view to furnishing a report upon the trade of the United States. A lecture delivered by M. Lourdelot on his return a few weeks since, entirely bears out the similar experience of his own countrymen on their similar but privately-subsidised committee of inquiry. The development in all the great American cities of branches of trade for which, till within a few years ago, our cousins were solely dependent upon Europe, is now amazing, and in every case American intelligence has introduced improvements into the machinery used. Upholstery, cabinet-making, silk-weaving, bronze-founding, jewelry, artificial flower-making, branches of trade, it can be seen in which a large share of art is absolutely necessary, are all actively pursued in New York. The models are European, it is true, the workmen European also; but the rest is purely American, particularly all the numerous applications of machinery. One feature is especially worthy of notice; when it is felt that a workman has lost his delicacy of hand he is sent back to Europe for a year or so to get his hand in again.

But the chief element of competitive danger arises from the superiority of the tools and machinery used, the admirable management of the workshops, and the consideration given to many other details too often neglected on this side of the Atlantic. The conditions of commercial production having so completely changed within the last generation, it can be understood what an important element this feature constitutes. It is freely admitted that it is the superiority of their machinery quite as much as their large supply of raw material which enables the Norwegians to export to the rest of Europe at such low rates their ready-made doors and windows. To take one typical branch of trade,—the old-fashioned bench, the few regulation tools, the glue-pot, and the set of primitive cramps used in the innumerable unhealthy little workshops not only in Paris but in London, suited the needs of the past, but are utterly inadequate to cope with the necessities of the present.

Much as we may "rear up," to use an Americanism, against the invading influence of competitive commerce; much as we may deplore, from an artistic point of view, its fatal effects, our acquaintance with the laws of evolution show us that these are some of the inevitable consequences of that struggle for existence,—of that fundamental principle of the survival of the fittest,—which is now so universally accepted as that of the progressive development of our race. America, which has taken up the subject of its commerce in the practical spirit with which it approaches most questions, will, probably, be the first to solve what so far appears to justify the fears of those who claim that the demand of art must suffer by the competitive direction of modern commerce. With that shrewd absence of prejudice which enables them to approach impartially the consideration of subjects on which we, of the Old World, have made up our minds, our "kin beyond the sea" have not by any means neglected the article in the development of that commerce with which they dream they will not only be soon able to stand independent of our help, but even supply our markets.

In the meantime, while in America they are endeavouring in every way to increase the efficiency of their art schools and their art training generally, they have seen the large field which lies open for the exercise of those inventive faculties for which we have at all times been so ready to admit the superiority of our "Yankee" cousins, and this field has been well worked in the direction of an improvement of what tools are necessary in the workshops. It is a problem we would rather leave

to the discussion of the politicians and the socialists how far the extension of the application of machinery to work so far done by workman, either pecuniarily or intellectually, this latter feature being, perhaps, the most important of all, from the leisure machinery should procure to the working classes. But unquestionably, whatever may for the moment be the results of these radical changes in the conditions of commerce, the advent of America and American industry is creating a sensation which has already caused some of the older nations to "sit up." Under such conditions we must not repose undisturbed; we show, in fact, in many ways, that we are far from indifferent. Our old tools must be replenished, renewed, and in many cases set aside; and amidst our old tools may be ranged many old "saws," many old precepts, many old principles, many old traditions, which, though they may have worked admirably till now, are not calculated to stand the strain of an entirely new series of conditions.

THE GARDEN, CLIFFORD'S INN.

"In the garden, an airy place, and neatly kept, the gardens being enclosed with a palisado paling, and adorned with rows of lime-trees, are set grass plots, which have a pleasant appearance, intersected by gravel walks." So writes Maitland in his "History of London" (1739). "This land to let [sic] on building lease," say the owners of the freehold on a board which they have just set up in the old Garden, Clifford's Inn. The garden, adjoining that other which takes its name from having formerly been part of the Rolls House area, retains but few features to merit Maitland's encomium; but it is a grateful refuge, nevertheless, and can be ill spared for the objects proposed.* It lies between the hall, to the south, and a modern block of buildings known as the Judges' Chambers; these latter are now occupied by the Record Office for the sorting, binding, &c., of State papers. Eastwards stands a set of chambers, Nos. 15-17, one of the oldest in the Inn. In a garret here the subject of one of Jack Bamber's choicest stories committed suicide, as related to an admiring audience, including Pickwick and Lowten, at the Magpie and Stamp. On the pavement flags below passed a memorable interview between John Roksmith and Boffin.

Clifford's Inn, as an inn of Chancery, appertains to the Inner Temple. Its origin dates from a period remote. It had been a residence of the barons De Clifford, ancestors of the earls of Cumberland, and themselves descended from Walter Fitz Ponz, who, by his marriage with Margaret, daughter and heir of Ralph de Toeni, of Clifford Castle, county Hereford, was father to Fair Rosamond. In a grant of 24th February, 3rd Edw. II. we read:—"The king granteth to Robert Clifford [son of the great Roger de Clifford] that messuage with the appurtenances next the church of St. Dunstan's-in-the-West, in the suburbs of London, which messuage was sometimes Malcolines de Herley, and came to the hands of Edward I. by reason of certain debts which the said Malcolines was bound . . . to our said father . . . which house John Earl of Richmond did hold at our pleasure, and is now in our own possession." &c. This grant was held by one penny's service, payable at Michaelmas. Isabel, Robert's widow, let the premises, 18th Edward III., for 10l. a year to students of the law, who, in the record, figure as *apprentici de banco*. By some means the property reverted to the Crown, and then again to the Cliffords. Eventually it became a permanent settlement for lawyers in virtue of a grant in fee-farm to Nicholas Sulyard, principal, and benchor of Lincoln's Inn, with others the seniors, for a sum of 500l. and a rent of 4l. temp. Henry VI. We are here reminded of William, son of Francis Sulyard, Bedchamber Usher to Henry VIII., to whom Robert Sherborne, Bishop of Chichester, leased Lincoln's Inn. The modern Gothic hall standing just northwards of St. Dunstan's Church, carries over the passage the initials and date P. W. M., 1767. In the windows is some good old coloured glass. In the thoroughfare between the buttery and screens and elsewhere may be seen the armorial bearings of the

* Its sorry condition until recent years was probably due to the periodical inroads of a mob who would run riot all over the ground to share a dole, in kind, which used to be distributed here at the beating of the parish bounds.

house,—chequy, or and azure, a fess gules, besanté sable, within a bordure of the third. The hall is chiefly notable as being the place where sat Sir Matthew Hale with Sir Orlando Bridgman, then Lord Chief Justice of the Common Pleas, and the other Judges, to adjudicate upon the multitudinous conflicting claims between landlord and tenant after the Great Fire. So satisfied were all parties with their discharge of this grave office that the Corporation ordered the Judges' portraits to be painted for the Guildhall. Coke (1571) and Selden (1602) were admitted of Clifford's Inn. The regicide Harrison served as clerk to one Thomas Houker, whom Clarendon calls Hoselker, an attorney here. Sir John Bramston says in his Autobiography that Harrison persuaded his fellow clerk, John Bramston, to take arms against the king. Clifford's Inn too is the reputed home of Robert Poltock, author of the one successful imitation of De Foe's story, namely "Peter Wilkins."

MILITARY ARCHITECTURE.

SIR,—Will you allow me to make a few comments on your interesting article [p. 502] on this subject, written with reference to the recently-published important work of Mr. G. T. Clark? As a genial opponent, you have already had occasion to notice my views on physical subjects; but I trust that twenty-six years of experience in regard to the matter on which I am now addressing you will be some excuse for my wish to occupy again a portion of your valuable space.

Your article commences thus:—"Military architecture, as a living art, has long ceased to exist." I am afraid, sir, that this *dictum* must bring me at once to close quarters with you. I think that, on a more detailed examination of the science and art of what is known at the present day as "permanent fortification," you would be inclined to agree with me that this branch of construction differs but little in principle and in practice, only in degree and detail, from the military architecture of the later Middle Ages. Further on, you say, "the old line of ramparts is succeeded by detached earthen forts 'scarcely distinguishable from the upland meadows from which they rise like great ant-hills.'" Now, in respect of the landward portions of modern permanent fortifications in England, this latter passage gives a very good idea of the *appearance* of these isolated forts. But, if you were to see the plans of one of these forts, I think you would be more apt to speak of them as detached *masonry* forts. For, with the exception of the earthen fronts of the ramparts, these works are simply masses of masonry. The escarp, flanking caponiers, with the numerous galleries leading thereto, the countermine, the casemates for the troops, the tanks, the magazines of all kinds, the shell-stores, the foundations and racer curbs for the gun platforms, and the covering vaults for the guns on the ramparts, are invariably of masonry; and so are usually the inner revetments of the ramparts, the equipment and supply stores, the gorges, and the counterscarps of the ditches. None of these forts in any country consist of the "simple ditch and earthen mound," to which you say permanent fortification is now reduced. And even in regard to the so-called "earth" of the ramparts, this material is, in reality, in nine cases out of ten (for forts are usually built on elevated and more or less solid sites) broken rock from the excavations, unsuited for building material. Again, you mention the "re-adoption" of the "simple ditch," as if ditches had not (as a rule) formed integral portions of Medieval works; but I think you will find that this was actually the case. It is certainly true that, since the time when artillery was completely introduced into the art of warfare, the object of the military architects and of the military engineers who superseded them has been to *smoke* the whole construction as much as possible in order that it should not present an unnecessary target to the deadly fire of artillery. And those portions which could not be concealed, such as the fronts of the ramparts, have certainly been built with excavated material of a nature less damageable by shot and less splinter-producing when struck than was the masonry of those days. But I think this change may be looked upon rather as a necessary adaptation of the art of the military architect to meet changes in the arms in use than as a wholesale obliteration of his

art. Again, ever since the days when artillery fire was first known, the principal aim of the military architect (and this profession appears to have been more or less recognised till nearly the beginning of the eighteenth century) was not "to resist his enemy by sullen masses of inert masonry," nor to delay his foe by sunken obstacles, but to provide such an excellent emplacement and disposition for his guns, that their fire should either be unobdurable, or that it should necessitate great efforts and delay on the part of the besieger to crush it by a superior number of his own guns, converging their fire upon it. You also say that "the rifle and the spade are henceforth to be the soldier's twin weapons of offence and defence, and the Moncrieff pit is the modern antithesis of the Norman keep." But, sir, at the present time artillery fire is more than ever the instrument in which attackers and defenders put their trust. In a regular siege the rifle is almost nowhere. And the allusion to the "Moncrieff pit" is hardly appropriate, for these emplacements are employed solely for the mounting of the heaviest kinds of defensive ordnance.

In reference to your mention of "detached forts," as constituting the land fortifications of the present day, there is no doubt that the inland material defences of our dockyards do practically consist of these works. But it would be a gross delusion to imagine that they are the main defences of these great naval establishments. It is thoroughly recognised on the Continent that these rings of forts constitute merely "fortified camps," and that the main defence of the place consists in the masses of troops (in fact, in the army) which is needed to guard the intervals between the forts. These intervals vary principally according to the funds at the disposal of the military engineers. At Pembroke Dockyard the land defence consists of one small fort, and all the rest is interval. This fort I had the honour of constructing (in part) during the years 1866-7. At Plymouth there are comparatively (to Pembroke) small intervals—that is to say, the two biggest are about eight miles and three miles in length, respectively. I do not, however, wish to pursue this particular phase of the subject; I would only add that for several years before I left the corps of Royal Engineers (which was in last July) I wrote as strongly as I could against this vicious and misleading system of detached forts; that the officer who constructed most of the Plymouth forts (the late Col. C. C. Owen, C.B.) wrote against them eighteen years before I did, with equal vigour and equal ill-success; and that their employment is by no means a necessity in modern permanent fortification. Nothing has yet been adduced by the military engineers who conceived them to prove that the advent of rifled artillery should (as practically it did) involve the supersession of the continuous lines of rampart and ditch which had till then been everywhere adopted.

In regard to the question of the disuse of the term "military architecture," I think it will be found that the gradual disappearance of "military architects" was the principal cause. These men were generally civilians, especially before the seventeenth century; and the gradual introduction into the services of the various monarchs and republics of "military engineers," men whose original *raison d'être* was principally to undo the work of the military architect, i.e., to devise and apply machines and arrangements for attacking and capturing their strongholds, apparently led to these engineers being employed as constructors and designers of the works they knew so well how to destroy. The arrangement was probably an economical one; and the old military architects by degrees became extinct. About the same time the French term "fortification" superseded that of "military architecture," and engineer-designed fortifications became, under Vauban's deadening sway, the military rule of the day. I am, however, one of those military engineers who, so far as the designing and construction of permanent fortifications are concerned, are proud to look on themselves wholly as *military architects*, and as the successors of those celebrated military architects who may be said to have remodelled and almost recreated the art of military architecture after the employment of artillery had become general. Modern permanent fortification is practically the development of the designs of the great painter, engraver, and military architect, Albert Dürer, who wrote about 1527, and perhaps also of one

of his successors, Daniel Speckle, who was also a civilian military architect. I am decidedly of opinion that the employment of engineers in the designing of what are really architectural, and not engineering works, has been most prejudicial to the art of military architecture. Originality, has been almost stifled. Unless, perhaps, it is the French engineer, Choumard, I cannot recall the name of a single military engineer who has essentially advanced the science or art of military architecture. I am far from saying that no military man has advanced it; for no one, probably, has taken a more energetic and skilful part in modernising and improving Dürer's ideas than Marc René de Montalembert, a general of cavalry, whom the French military engineers opposed with all the bitterness and animosity with which the possessor of any close borough or snug monopoly might reasonably be supposed to be inspired. During Montalembert's lifetime he was looked on rather as a sort of charlatan than otherwise, and he met with no gleam of success. Now, every nation in Europe, and especially the French, are adopting his principles (i.e., those of Dürer), and are throwing overboard the complicated bastioned system, which, thanks to the influence of the French engineers Vauban and Cormontaigne, reigned so long. Again, Rimpler and Coehorn were certainly possessed of originality, and especially Rimpler; and these architects were both soldiers, though not engineers. But Dürer, Martini, Castriotto, Marchi, Speckle, Freitag, and Mandar, all leading names in respect of originality in military architecture, were civilians, and so were many others whom, within the compass of the present letter, I cannot bring to notice.

But even in these days the civil architects of Great Britain have not been wholly unrepresented in the sphere of military architecture. I allude to the well-known architect, James Fergusson, who, in 1849, put forward his views on the subject, and submitted a paper to the Royal Engineers, which, I regret to say, was refused publication in their "Professional Papers." There is considerable originality in Mr. Fergusson's ideas, and if he had only possessed at the time a more complete knowledge of technical arrangements, his proposed system would have been of much value. Even as it was, his ideas on the defence of England, persistently placed as they were before the public, resulted in his being chosen by the War Minister of the day as a member of the Royal Commission of 1860, to whose proposals we owe our present defences. Now I do not at all see why civil architects should not be invited by Government to take up the study of military architecture, and to endeavour, by competition or otherwise, to obtain employment as military architects. As I said before, what we call permanent fortification is simply ordinary architecture under certain military conditions; and those military conditions consist in the designing architect having an adequate knowledge of the powers, dimensions, and equipments of the arms in use. It is by no means essential for the possession of this knowledge that the designer should be a military man. I think that British military architecture (if I may now be allowed to use this most reasonable expression in lieu of that of permanent fortification) would be immensely advanced by the new ideas and by the original light that would be poured on the art if it were thrown open to the whole body of the architectural profession. The design and erection of architectural works, whether civil or military, is of a purely peaceful nature. Military architecture is, in fact, a peaceful art, whatever military engineering may be. In connection with this proposal of mine to liberate military architecture from its present engineer monopoly, perhaps you will allow me to mention, in regard to (so to speak) the converse side of the question, that I am at this present moment attempting to apply the experience I have gained in military architecture to practice in the civil side of the profession, and that I have recently formed one of that devoted band of 120 men who sent in competition designs for the new War Office, but unfortunately did not succeed in impressing the judges with their merits.

Before I close this letter, I would like to mention that, in regard to the use of earth for portions of fortifications, in 1877, whilst at Gibraltar, I had the honour of designing (not adapting a sealed pattern design, as is the usual practice at the War Office, but actually designing) the purely landward open battery

known as Princess Caroline's, and wholly of that durable material (the material *par excellence* of the modern military architect) known as Portland cement concrete. This battery was erected under my supervision, and it displaced an old one on the same site which was built of earth (so-called) revetted with stone. I mention this as an instance that in at least one great European fortress, the land batteries have not all of them even an earthen front. I designed several other new batteries at this fortress with the same material, but these were all coast batteries. And this brings me to the subject of coast military architecture, which your article appears to have overlooked. The great majority of modern coast batteries for the heaviest guns are, in these days, almost invariably built either wholly of masonry or chiefly of masonry and partly of iron. A cursory inspection of the coast defences of Portsmouth, Plymouth, and Pembroke would satisfy any one on this score. Iron is rapidly becoming obsolete, chiefly on account of its prodigious costliness, and simple Portland cement concrete open barbettes batteries are rapidly becoming the order of the day. It must be understood that the objections to the use of ordinary masonry in landward works apply with more force than to its adoption in coast works. But for all kinds of works Portland cement concrete has qualities greatly superior to any sort of stone masonry, brickwork, or earthwork. It does not splinter when struck as the two former do, it disintegrates far less when struck, its toughness and homogeneity are greater, and it is practically much cheaper. It is, moreover, far more adapted for casemates and bombproof constructions generally. In comparison with earthwork, Portland cement concrete cannot be blown to the winds as is done when a large siege shell buries itself in an earthen front and then explodes, and a parapet of Portland cement concrete actually needs far more battering by a land attacker's guns to render it unserviceable than would a parapet of earth at least three times its thickness. I feel convinced that the military architecture of the near future, in respect of landward works, consists in the extermination of this material for all the more exposed portions, such as the ramparts, and in a return to the old *ancients*, modified, when rendered necessary by reasons of economy, by breaking up the continuous rampart into inner detached batteries, but leaving the ditch or obstacle in its continuous state.

I have not as yet had the pleasure of reading Mr. Clark's work, but I certainly think that it appears very opportunely. I am unaware of any researches in Medieval military architecture that have ever been made by military engineers, and this book goes to show that much light can be shed on military subjects by other persons than trained military men.

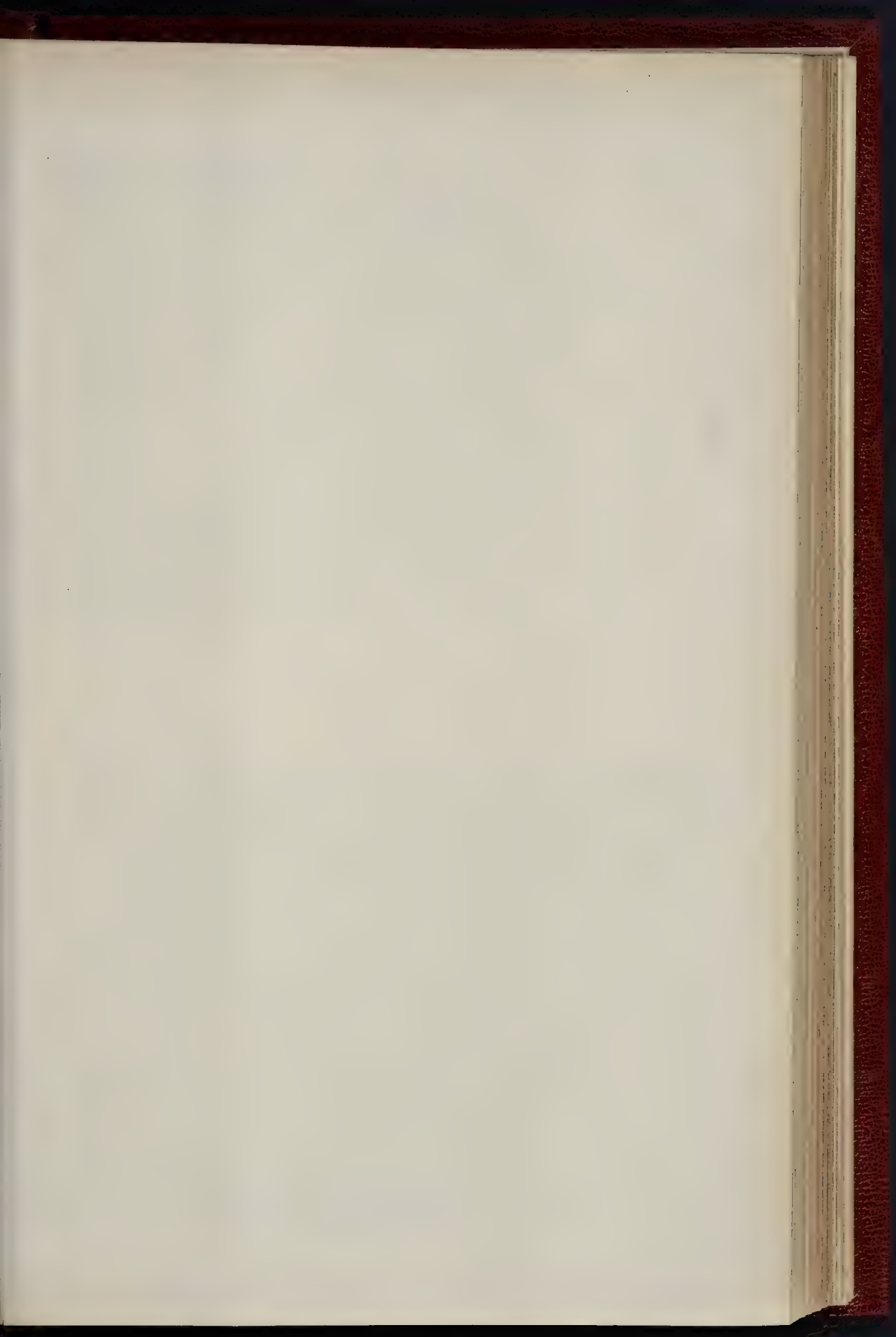
ARTHUR PARNELL,
Colonel (late Royal Engineers).
Newcastle-on-Tyne, April 12th, 1884.

NEW POST-OFFICE BUILDINGS, ROSTOCK, MECKLENBURG.

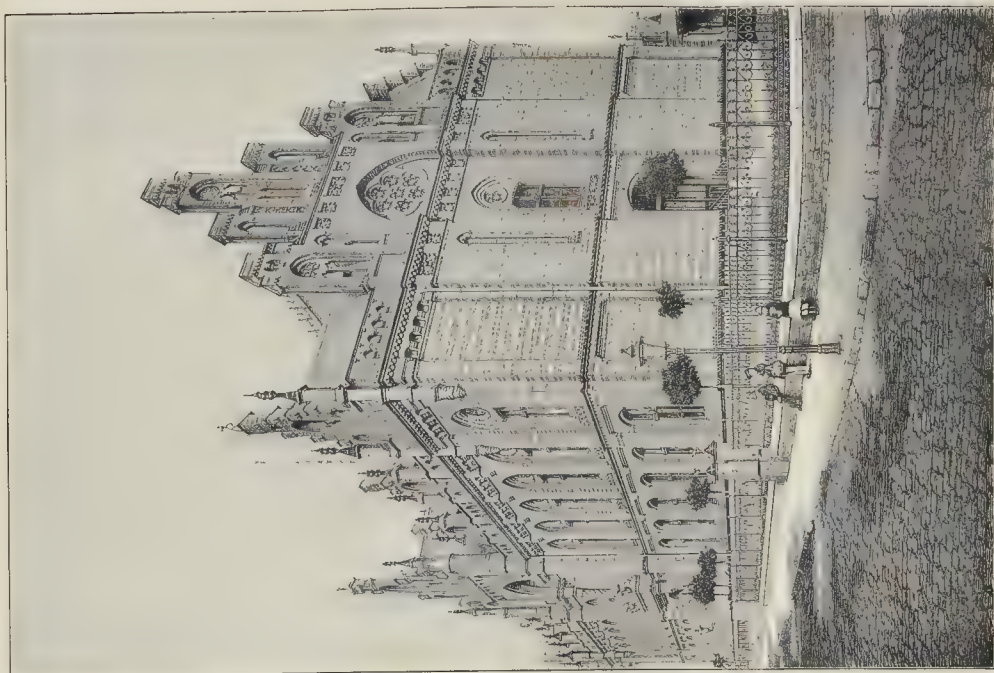
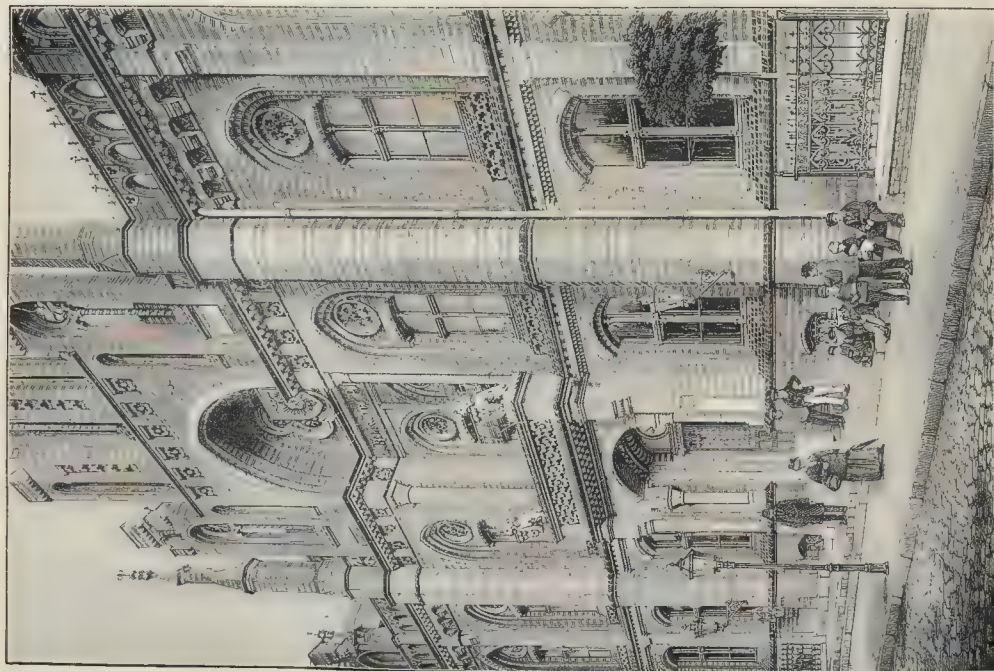
THE German Government have been doing a good deal in the way of Post-office building lately, mostly in the Renaissance style, which is much more practised and, we may add, much better understood in modern Germany than anything allied to Gothic art. But in Rostock, which is a town interesting from its old brick buildings, a somewhat exceptional attempt seems to have been made to produce a brick building which should express modern feeling, and, at the same time, harmonise to some extent with the town. We give a view showing the general effect of the building, and the treatment of the central portion on a larger scale. There is rather too much of made ornament and artificial skyline, nor can we by any means admire all the detail; but there is a certain boldness of character about it, and an intention, at least, to be picturesque; and, apart from the question of architectural excellence, it will be of interest to some of our readers as an example of modern German official architecture.

The views are engraved by Mr. J. D. Cooper, from photographs.

The Civil and Mechanical Engineers' Society.—The annual dinner of this society will be held at the Holborn Restaurant on Wednesday, the 30th inst. The president, Mr. R. Harkness Twigg, M. Inst. C.E., will take the chair at half-past six p.m.



THE BUILDER, APRIL 19, 1884.

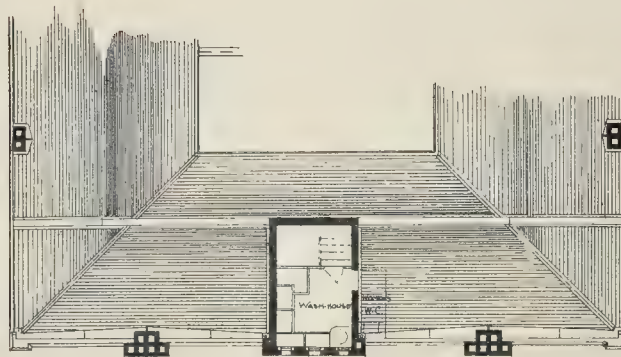


NEW POST-OFFICE BUILDINGS, ROSTOCK, MECKLENBURG.



-WAREHOUSE- CHARLES STREET DRURY LANE, W.C.

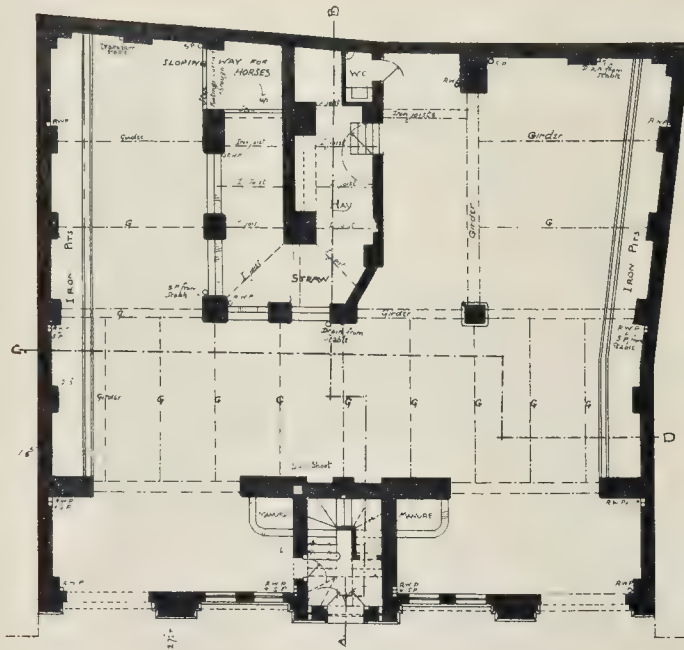
Mc Joseph Peacock Architect.



ROOF PLAN



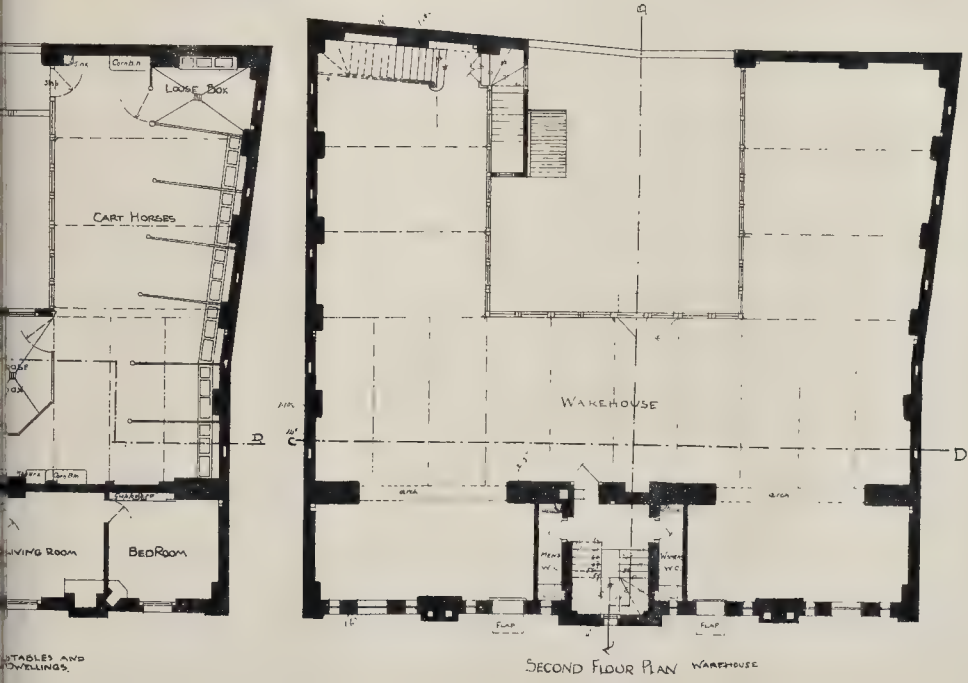
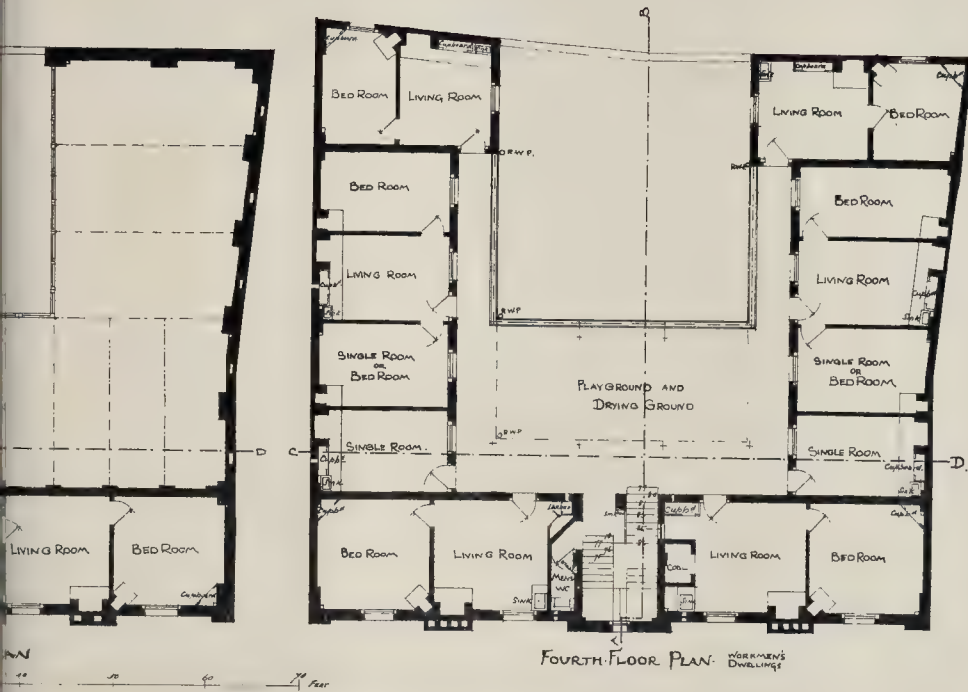
THIRD FLOOR

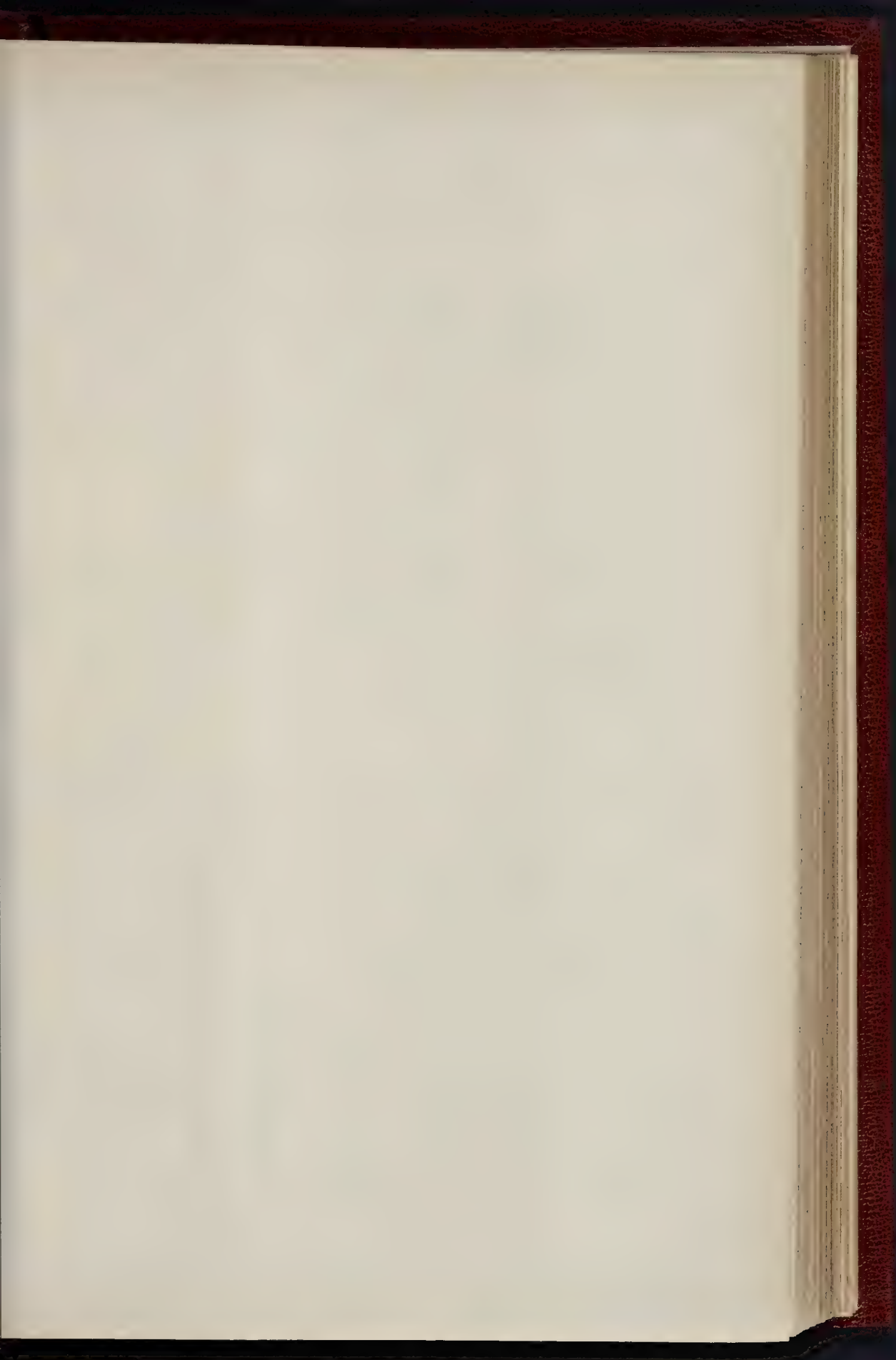


GROUND PLAN

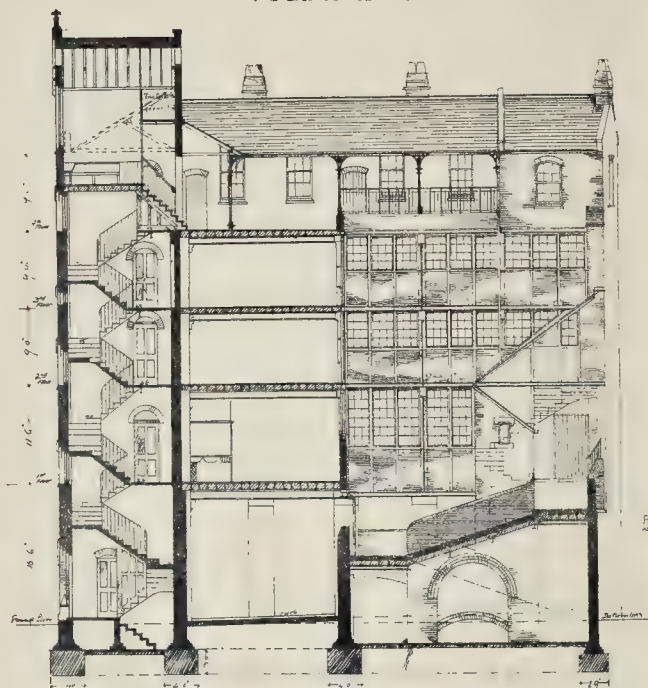


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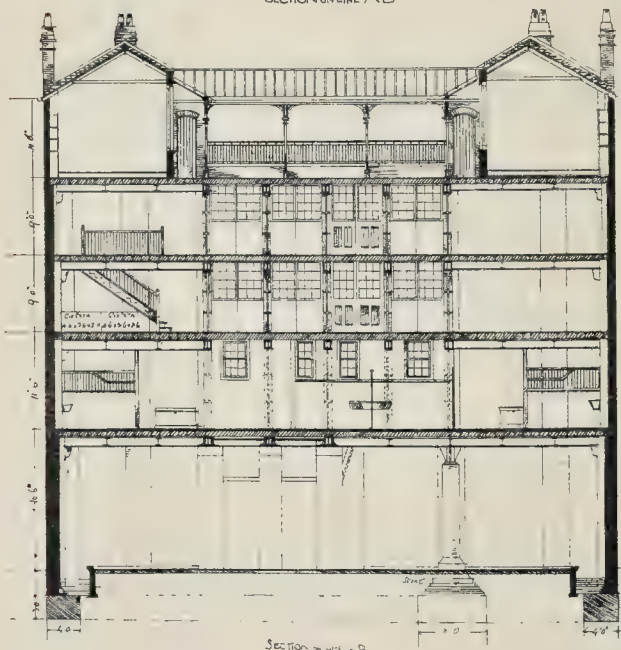




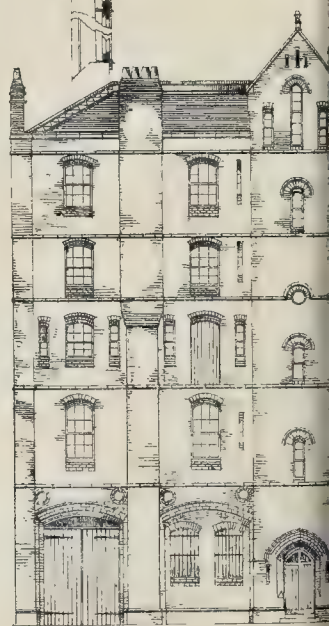
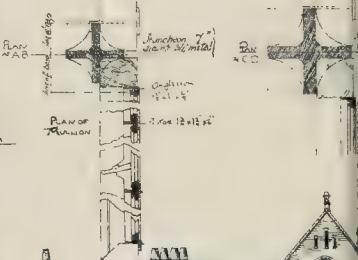
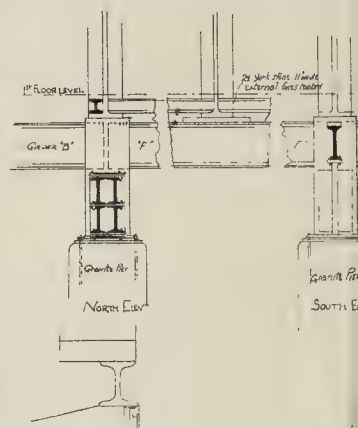
WAREHOUSE-STABLES-AND-DWELLINGS - Charles Street Drury-



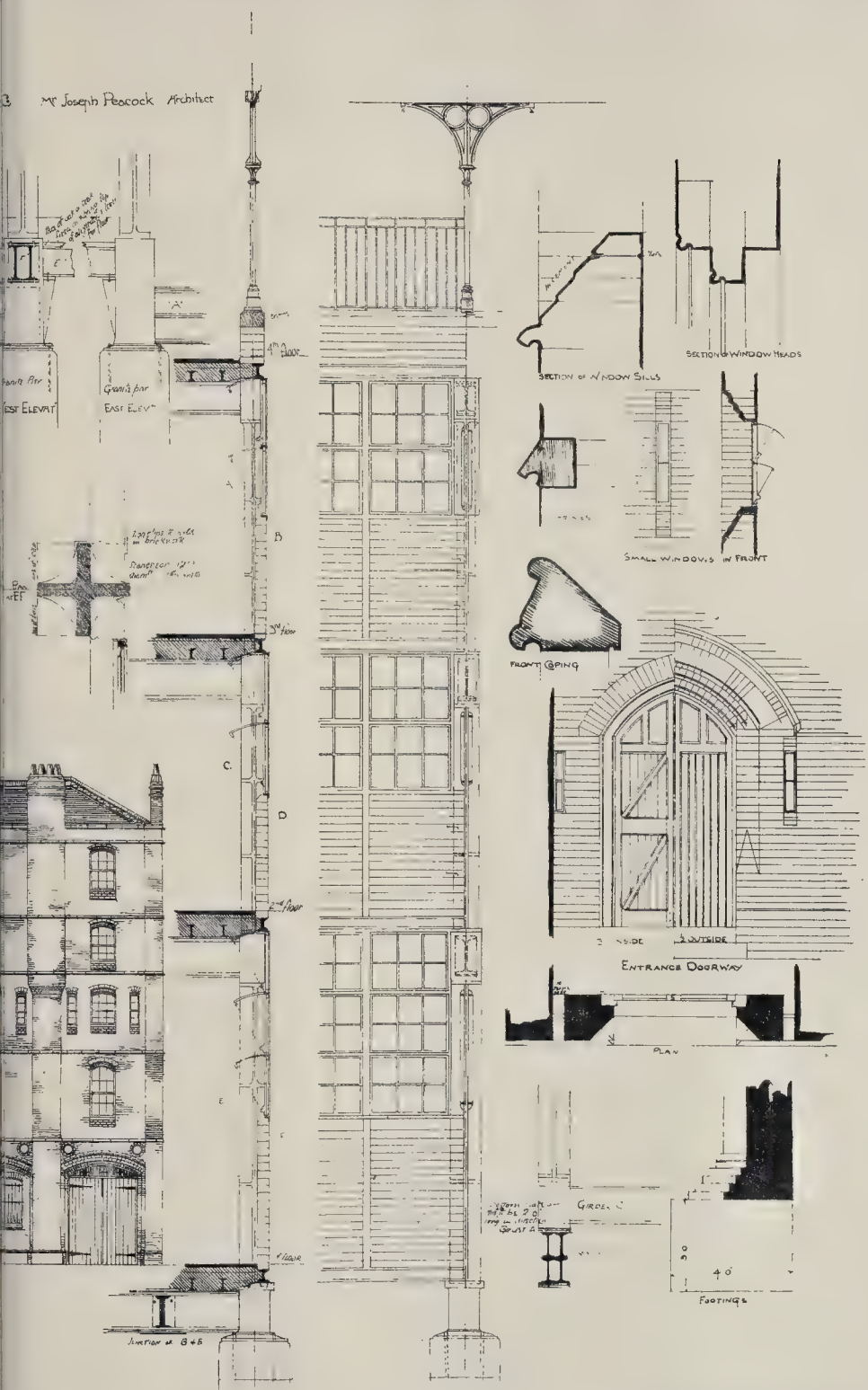
SECTION ON LINE A-B

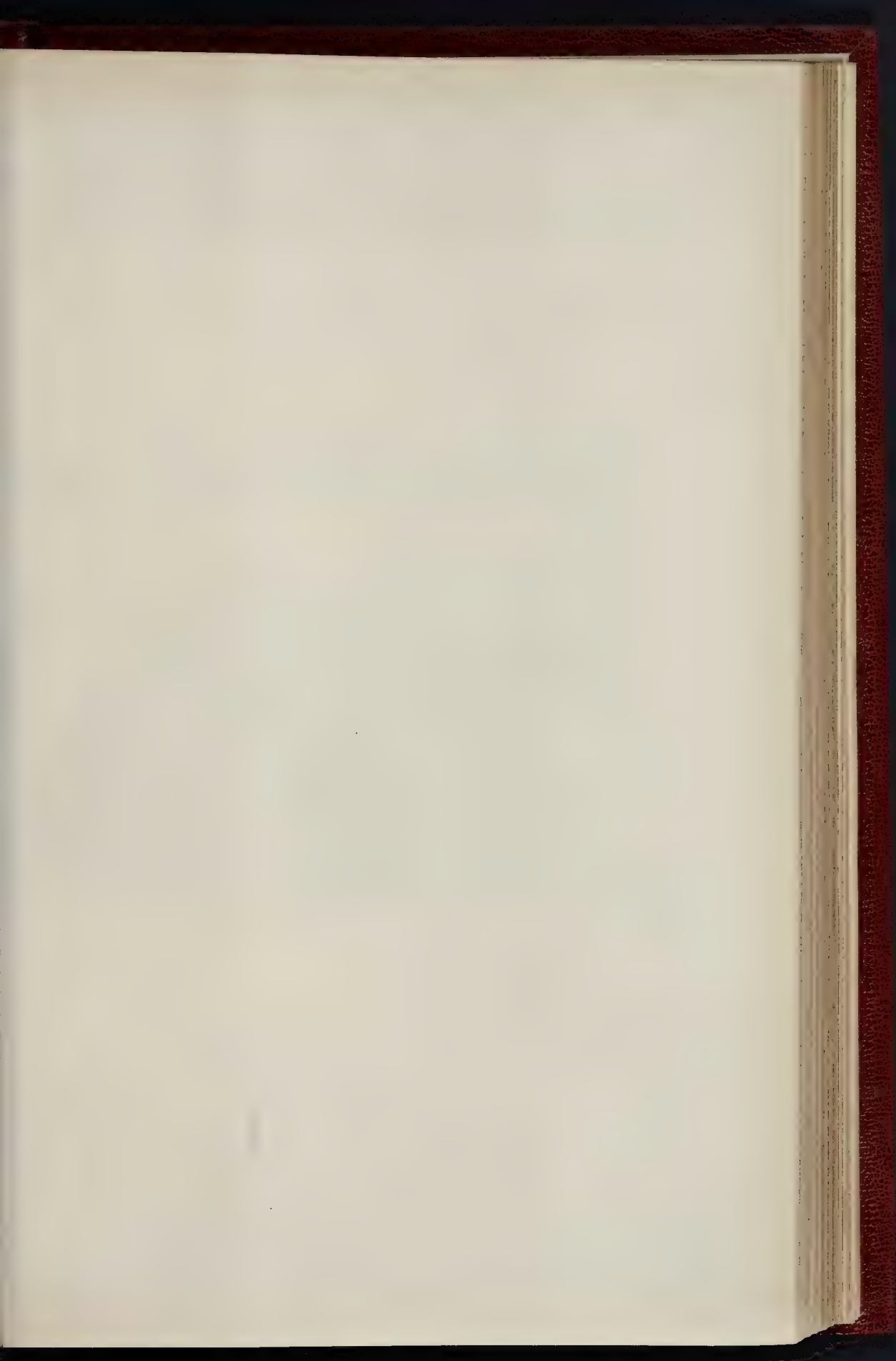


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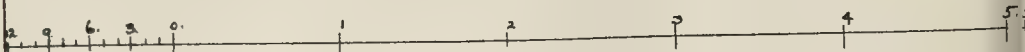
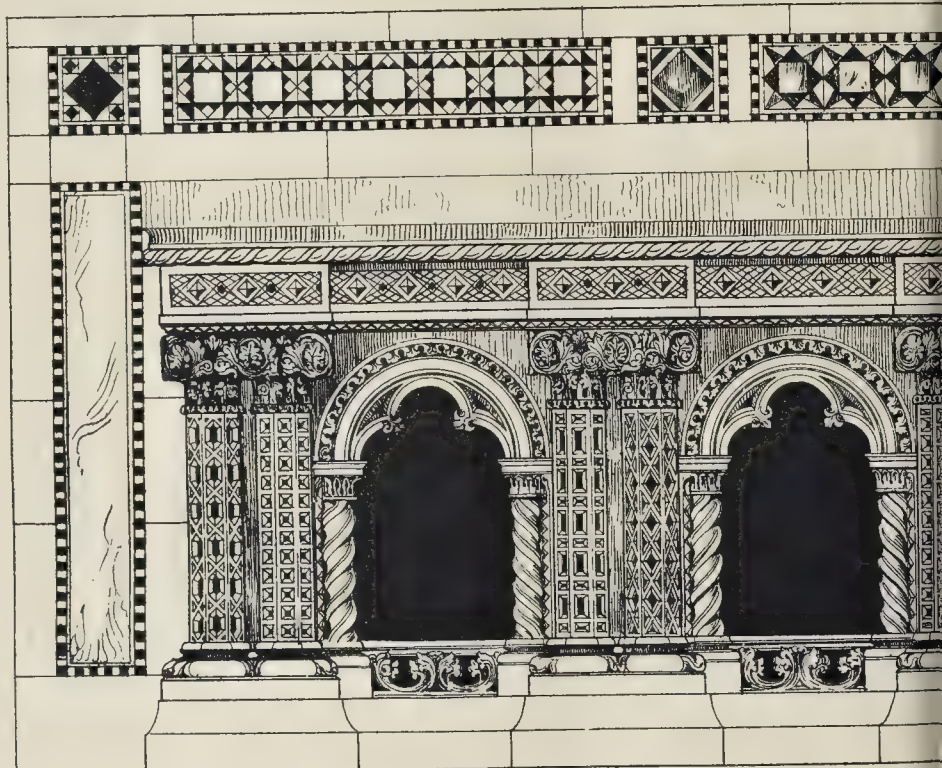


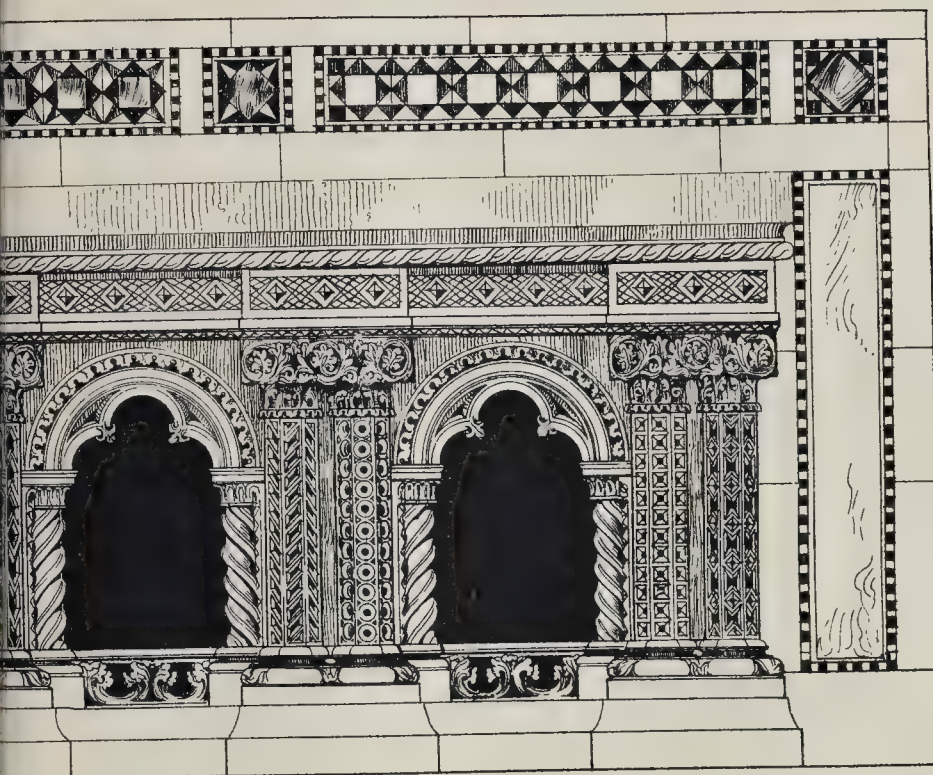
FRONT ELEVATION





New Communion Table. CANTERBURY. CATHEDRAL





Mr. John. Oldrid. Scott. Architect.





ENTRANCE-FRONT OF THE RATH-HAUS, HALBERSTADT (1663).

PRACTICAL WAREHOUSE
ARCHITECTURE.

We give the plans, sections, and other details of this building, as a rather unusual example of the arrangement of a warehouse building to fit an irregular shape of site, and to combine various requirements. On the ground-floor are store-rooms; on the first floor horses, with a sloping way up; above the stables two stories of warehouses, and above them again tenements for the people employed on the premises. The building was erected for Messrs. Pfeil, Stedall, & Son. The ground-floor is occupied with pits for stacking iron, which, of course, is more conveniently and economically stowed there than on a higher floor, which would require very special treatment to meet the great weight; hence the exaltation of the horses to the floor above, contrary to usual custom.

The buildings were erected, in two contracts, by Mr. Nightingale and Mr. Toms, at a cost of 3,500*l.*, from designs by Mr. Joseph Pencock. The building may be said to be remarkably cheap considering what is included in it, and is an unusual example of the combination in one structure of men, horses, and goods employed by the same firm, in such a manner that their different elements do not seem to clash with one another.

COMMUNION-TABLE, CANTERBURY
CATHEDRAL.

The design for a Communion-table, or Altar-table (according as the ecclesiastical proclivities of the reader induce him to call it), for Canterbury Cathedral, by Mr. J. Oldrid Scott, is a good example of the architectural treatment of such an object, in which a greater degree of richness and play of fancy is allowable, in adapting architectural details to employment on a small scale, and for what is in reality a piece of furniture, than would be suitable for work on a larger scale and for more solidly constructive purposes. The richness of effect is gained mainly by inlay, and by the use of twisted and octagonal shafts. An inlaid background or border surrounds the whole.

ENTRANCE FRONT OF THE RATH-HAUS.
HALBERSTADT.

This quaint and picturesque bit of architecture is an interesting example of the rather homely expression which Renaissance architecture put on when transplanted into German territory. Every portion of detail may be traced to an Italian origin, yet the whole as developed here is thoroughly German. The ornamentation is not altogether well distributed; the panelling over the arches rather weakens the arcade, and the ragged fringe of ornament stuck on to the gable is very bad; but there is a harmony about it as a whole which carries off these defects of detail.

SHERBORNE ABBEY CHURCH TOWER.

TRAVELLERS on the South-Western line on their way to Devonshire will notice the great abbey church, and its low, massive central tower rising above the houses, which are crowded all round it, and hide its aisles and ambulatories: after Salisbury, it looks very low and unimportant, and few would imagine what a truly magnificent interior this tower crowns. In its square, massive form its Norman origin shows itself, and reminds one of Winchester and St. Alban's. It is a remnant of the great Norman church, erected by that rather turbulent Bishop, Roger of Sarum, at the time when he was building his castles and churches at Sherborne and Malmesbury, and the castle at Sherborne itself; but he was not the founder, for, excepting a small portion now standing, he pulled down St. Aldhelm's and King Ina's cathedral church. After that, obeying the Norman king's order, the bishops had, in 1072, deserted "the villa," and gone to the "great towns" (although Old Sarum, where the Bishop of Sherborne migrated, has sunk into utter insignificance). Three of the great Norman arches and the upper gallery of Roger's tower exist; the fourth was cleared away by the great building abbot Bradford, when he built his magnificent choir in 1430 (about). Many facts have come to light during the careful examination made for the report furnished to

the committee by Mr. R. H. Carpenter and Mr. B. Ingelow. It seems that Bradford erected his choir, including the springers of the fan vaulting, and then temporarily roofed and thatched it over; he took out the Norman eastern arch, but before doing so he inserted a double stone relieving arch in the thickness of the east wall, concentric with the line of the choir transverse rib; this arch was apparently inserted in short pieces, and half through the wall, until complete, when the Norman wall under was removed; but the weight coming on the arch seems at once to have caused some yielding and fracture in the wall above. They, however, levelled the top of this sunken wall, and started a great slope above the Norman open gallery, which of course had a passage between double walls,—the inner arcaded and the outer solid. This slope enabled the builders to erect their tower, or rather lantern, with only a 2 ft. 6 in. rise, which rested only on the inner arcaded Norman wall. The massive external effect was cleverly produced by buttresses resting on the slope. In the old belfry windows are existing the principal iron crossbars for glazing, passing through the mullions, and glass grooves exist also, showing that the lights were originally glazed as a lantern, yet Abbot Bradford put one or more small service bells into his tower. Possibly he intended the Norman gallery to be seen with a flat floor over it, with a rich panellied arch opening into the choir vault. This vault now exists under the tower also. The old Norman nave, and the early Perpendicular church of All Hallows, built like a great "narthex," were used by the secular clergy, and great disputes arose, partly because these clergy were annoyed by the monks' bells, and in the last great riot an All Hallows priest set fire, by a burning arrow, to the thatch of the choir and the roof. This fire spread up into the tower, and its bells and woodwork fell into the church, and burned its stalls, &c., leaving crimson scars in all directions, discolouring of course the springers of the groining and the panellied arch. Curiously enough, however, the springers of the tower vault are not discoloured, though the whole upper part is. This tends to the conclusion that the tower groining was an afterthought, and was put in to hide the injured lantern when Bradford completed his choir vault, adding again to the overburdened tower piers.

These piers, like those of Chichester and Peterborough, were only thin unbanded skins of masonry filled with rubbish, and had crushed in themselves and also dislocated the new work added by Abbot Bradford, so that repairs to windows and other features soon had to be executed, and are now still evident, but it is interesting to note there was then no glass put into the windows of the belfry. There were put in two or three bells; the present "Lady bell," a beautiful one of 34 cwt. in weight; and then, again, Wolsley's bell of 52 cwt.; and then in course of years, even up to 1858, were added others, more or less crowded and badly hung, and wedged up to the old fissured walls, till they leaned outwards and threatened to give way. Important precautionary measures were taken in 1830 by Mr. Percy, on Professor Wilkins's advice, and iron bolts and bands added, and trusses inserted under the bells to relieve the weaker walls. And later still, under the late Mr. R. C. Carpenter, the eastern piers were rebuilt in solid stone (centring the arches above), and portions of the western piers also. Still, the fractured arches and lantern walls remained, and the badly-hung bells made them vibrate and open with every swing, and the frame knocks against the walls as the great Wolsley tenor turns up and occasionally breaks loose and revolves in its weakened frame. Before preparing their detailed report, a scaffolding was erected by Messrs. Carpenter & Ingelow's directions, and every single stone was measured and sketched, and noted as to whether it could or could not be retained *in situ*. It was found that the tower was built of a poor local stone, much of it "face-bedded," and had perished greatly; but where the Mapperton stone (as good as the best Ham Hill stone) had been used it was perfectly sound: so the north and south sides will require only to be patched where decay has set in, but the whole east side has sunk through centuries of yielding, hastened by the increased decay and stress of the great bells, and the fissures, old as they are and widely gaping as they are, are opening still more, as the relieving arch has not sufficient abutment to resist the pressure. The architects felt,

therefore, that when the east wall was necessarily taken down there must be some unyielding base for it to stand on when re-erected: there will, therefore, be a solid brick arch starting on iron springers tied by iron tie-girders, thus taking away all thrust and bringing the weight directly on the already rebuilt piers. Then the old work will go back stone for stone when possible, but much of it was so injured by the great fire that it has yielded more readily to the weather and perished, and cannot be replaced. The west wall, through the sinking of the Norman arch, will require somewhat similar treatment, but not to so great an extent, as only the pier and buttress between the windows and a portion of the wall under are affected by the settlement. Strong platforms are erected over the nave and choir roof, so that the stones taken down can be laid out in position and the sound ones replaced. The rubbish and rotten mortar will be shot down to the ground. The side walls are strongly braced together, and the east wall is now in hand: the west wall will follow, and then the side walls will be repaired and the new parapet and pinnacles erected.

The contractor is Mr. Betton, of Sherborne; and the clerk of works is Mr. F. E. Smith. The new dressed stone will be the best "grey" bed of Ham Hill stone,—it is not as a fact grey, but is of a close, compact, and hard quality, free from the sand and iron veins of other qualities; the walling stone will be the Sherborne stone of a selected quality. Possibly some good old stone may be used from the Town-hall, which is being pulled down to open out the church, and to make way for the new Digby Memorial about to be erected from Messrs. Carpenter & Ingelow's designs. It is in memory of the late Mr. G. D. W. Digby, and will include bronze figures by Messrs. Singer of other great benefactors of Sherborne Church and Castle,—Bishop Aldhelm, Bishop Roger, Abbot Bradford, and Sir Walter Raleigh.

PRINCIPLES FOR THE ORGANISATION
OF ARCHITECTURAL MUSEUMS.

THE permanent commission of management for the Paris Museum of Decorative Arts have appointed M. Georges Lafenestre to draw up a report on the purpose, character, and system of organisation which should govern the Retrospective Exhibition that will be held at the Palais de l'Industrie during the course of the present year. M. Lafenestre is a member of the Council of Administration of L'Union Centrale, and Commissioner General to the Exhibitions of Fine Arts. It would, therefore, be difficult to find any one better qualified to treat the question at issue; and, as in matters of organisation the French have always enjoyed the highest reputation, we cannot fail to learn something by watching their mode of proceeding. The report is in reality an essay on the best method of utilising an exhibition as a means of improving the education of those who are interested in architecture and in the arts applied to industry. This practical purpose is too often forgotten in the desire of producing a good show rather than of conveying a useful lesson; and we therefore trust that M. Lafenestre's excellent advice may be followed, not merely by the organisers of the Paris Exhibition, but of all similar displays. Thus, as a fundamental principle, M. Lafenestre opens his report by insisting that each division of the retrospective exhibition should correspond with a similar presentation of modern work. If the past can benefit the present, the specimens of ancient work must be presented under the same conditions as the modern efforts of a similar kind.

There is, however, a tendency to exaggerate the merits of the antique, and the greater care should be displayed in selecting only that which really possesses in itself undoubted virtue. Nor is this sufficient. The objects, once found, require grouping in an intelligible manner, so that their true artistic and historic relationship may be evident. The eyes of the student must not be confused by the irregular mixture of discordant forms and contradictory impressions. All classification which illustrates more clearly a distinct idea is useful and fruitful; but classifications that divert the attention, distract the eyes, and embarrass the imagination, are dangerous and sterile. M. Lafenestre, alluding to the severity of foreign competition, urges that a sense of greater confidence must be engendered in the mind of the workman. This will not be attained by the display of incoherent

productions. Such shows may awaken idle curiosity and engender unproductive *dilettantism*. Useful lessons are only imparted by a concentrated assembly of choice productions, all of the same nature, the same epoch, the same style, resuming with as much intensity as possible the particular character of work that best suits the student's aspirations. In the forthcoming exhibition, the first two groups, stone and wood, comprise the whole retrospective section, for the employment of metals in architecture is a modern innovation. In presenting, however, fragments of stone or wood it is impossible for the student to appreciate their virtue unless some conception is given of the whole of which they only form a part. Hence it has been decided that, as far as possible, both models and drawings shall accompany the exhibits. The object will be to show how wood and stone are generally employed, and how the decorative effects produced by them are subordinated to the construction of a solid but expressive mass. To present a series of complete architectural works which shall enable the visitor to follow the modifications various civilisations have wrought in the art of construction, the reporter proposes to borrow the studies and projects of restoration made by the pensioner architects of Rome. These will deal with the buildings of antiquity and the Renaissance. The Minister of Public Instruction might lend the official collected copies of historical monuments to illustrate the Medieval school, and valuable specimens could be obtained from the Garde Meuble and the Sceaux des Archives. If to this collection were added a few of the best designs which the leading French architects have exhibited at the Salon during the last twenty years, an unequalled exhibition would be offered to the admiration of workers in the arts and sciences.

M. Lafenestre then proceeds to deal with the minutiae of organisation, and into this we need not follow him. If the principles we have briefly summarised are faithfully carried out, there can be no doubt as to the practical value of the exhibition we are promised for this summer. That the Ministries mentioned will lend whatever assistance is required, is a matter of moral certainty. The country has much to gain from such efforts, the Government nothing to lose, and therefore there should be no difficulty in the matter. By improving the technical knowledge and artistic faculties of both architects and artisans, the organisers of the exhibition will be doing something practical to revive French industry, and restore that prestige which has been somewhat impaired of late years by foreign competition. At the same time visitors of all nationalities can benefit by the contemplation of the rich collection of *chefs-d'œuvre* that will soon be gathered in the palace where so many exhibitions have already been held, and enough has been said to show that the biennial exhibition due this year will be of exceptional interest to architects.

GERMAN ECCLESIASTICAL ARCHITECTURE.

At a recent meeting of the Saxon Society for Ecclesiastical Art, Herr Victor Schultze read an interesting paper bearing on the question "How shall we build our evangelical churches?" He pointed out, in the first place, his intention of confining himself to matters affecting the requirements of evangelical churches from the standpoint of the Lutheran creed, leaving untouched those questions which relate to the technical portion of the subject. The following definitions were quoted by him in illustration of his remarks:—

1. The edifice should be built with a due regard to the practical requirements of evangelical worship.
2. It should be distinguished in its external appearance from the surrounding profane buildings, and should clearly proclaim itself to be what it is; that is, it should have an ecclesiastical character.
3. The religious sentiment, as embodied in Christianity, should be expressed as fully as possible in the architectural system of the whole, and in its separate parts.
4. The evangelical church should, as far as is consistent with the Lutheran evangelical creed, maintain a connexion with the ecclesiastical art of the past, and not display trials of new styles.
5. It should be a monumental building; that

is to say, a work of art, but the artistic element should not disturb the religious spirit of the work.

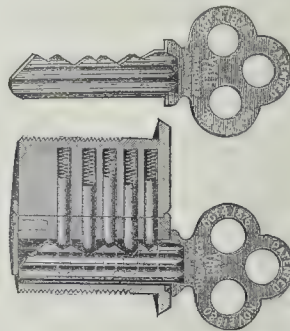
In treating the further question as to what styles fulfil the requirements indicated, Herr Schultze came to the conclusion that the Romanesque and Gothic styles are the most suitable. During the subsequent discussion, Dr. Mothes expressed a wish that the organs of ecclesiastical opinion would take up the matter and would draw up a comprehensive and definite programme, which would guide architects as to the exact nature and extent of the requirements to be kept in view in church-building plans.

IMPROVEMENTS IN THE YALE LOCKS.

The original Yale lock, with its small flat key of sheet metal, the introduction of which about twenty years ago is said to have "revolutionised the art of lock-making in America," comes before us with a new and very important modification, which consists in farrowing longitudinally the originally flat blade of the key, the lock being made with a cross-section to match. The corrugations are different in every key. We have thus a double security through two sets of changes, which are practically unrestricted in number. The key cannot do its work in the lock unless the notches on its serrated edge exactly fit the tumbler work inside; it cannot get into the lock at all unless the longitudinal corrugations on its surface exactly fit the section of the lock matrix.

Among the advantages claimed by the makers, are that tilting of the key in the keyhole is impossible, as the two are interlocked throughout their entire length. Should any unauthorised person get hold of the key, it is asserted by the makers that this would not serve him towards making a false key, as the corrugated key must conform to the section of the lock with an accuracy which is only attainable by successive processes by specially made machines.

It may perhaps be doubted whether man is capable of making anything in which it is beyond the ingenuity of any one of his fellows to circumvent him; but the Yale lock in its present form seems to be as invulnerable as we can well expect a lock to be, and its security is attained by very simple and direct means, requiring only thorough and effective workmanship.



The cuts show the appearance of the corrugated key, and the cross-section of the escutcheon of the lock, exposing the tumbler mechanism, and showing the key in position under the pins or tumblers.

NORTHERN ARCHITECTURAL ASSOCIATION.

A QUARTERLY meeting of this Society was held at Newcastle-on-Tyne on the 8th inst., Mr. F. W. Rich, president, in the chair. Mr. J. Oswald read a paper containing suggestions for increasing the value and popularity of the Association with the profession and the public. A vote of thanks was accorded to Mr. Oswald for his paper, and Mr. Newcombe moved that the question of the best means for giving effect to the suggestions contained in the same should be referred to the committee. Mr. Reay seconded the motion, which was carried. Mr. Rich and Mr. Newcombe were appointed delegates to represent the Association at the Conference to be held at the Royal Institute of British Architects in May next.

THE CRITERION THEATRE.

THIS theatre was re-opened on Wednesday last, after extensive alterations and improvements. It will be recollected that the theatre was closed in March of last year by the voluntary act of the proprietors, Messrs. Spiers & Pond, in order that alterations and improvements might be made therein, with the view of ensuring safety from fire, facility of egress, and improved ventilation. The problem was chiefly to provide additional means of exit, and the free admission of external air to the interior of this peculiarly situated building,—the ceiling of which is a little below the level of the surface of the pavement in Piccadilly,—and these conditions have only been met by bold structural expedients and the sacrifice of some adjoining property belonging to the proprietors. The work has been carried out in accordance with plans designed by Mr. T. Verity, the architect of the theatre, to the entire satisfaction of the Metropolitan Board of Works, who have granted their certificate of approval of the building for the purpose of a theatre.

The alterations are of such magnitude that in many respects the theatre has been reconstructed. The principal improvements may be described as follows:—A large area open from the basement to the sky has been formed on one side of the theatre, by cutting off a considerable portion of the adjoining Criterion Restaurant, thus giving direct light and air to all parts of the house. As an instance of the efficiency of this new area it may be mentioned that the morning sunshine can stream into the pit. Spacious new corridors have been constructed the whole length of the Piccadilly frontage on the stalls, dress-circle, and gallery levels, providing direct light and ventilation to these parts. These corridors lead on the one side to a commodious new Crash-room and to the new Piccadilly exit, and on the other side to the box-office entrance. In addition to this there are the former exits into Jermyn-street, so that every part of the house is abundantly provided with exits into two distinct thoroughfares.

The auditorium has been in a great measure reconstructed. Many of the private boxes have been removed, and the space thrown into the circles, making the house appear more open and spacious. The whole has been redecorated and upholstered by Messrs. Hampton & Sons.

The ventilation of the house is now effected on a system devised by Mr. W. W. Phipson, whereby it is claimed that the temperature in all parts can be regulated and maintained at 65°. Fresh air is blown into the theatre by a large fan, and the vitiated air is carried off by exhaust tubes leading into shafts warmed by the boiler and grill-fines. The fresh air enters from the back of the house, and the foul-air exhaust is towards the front and over the stage.

The stage, auditorium, corridors, and exits are entirely lighted by electricity, supplied from the most carefully-considered and fully-tested apparatus of the Edison Swan Company, and auxiliary gas-lights are everywhere provided. In the soffits of the upper tiers incandescent lights with white reflectors are sunk. These will be found very useful by those who wish to refer to their programmes when the interior of the house is darkened.

The tile work and wall decorations are by Simpson & Sons, and the structural work has been most admirably carried out by the well-known contractor, Mr. Wm. Webster, of Trafalgar-square.

COMPETITIONS.

Board Schools, Swindon.—The competition for the proposed new schools, to accommodate 600 children, boys, girls, and infants, has resulted in the selection of plans sent in by Mr. W. H. Read, of Swindon, under the motto "Experience." There were forty-six competitors.

Church at Crook.—In a limited competition amongst local architects for the erection of a new church and tower for Crook, near Kendal, the designs submitted by Mr. Stephen Shaw have been selected, and will be carried out under his care.

International Health Exhibition, London, 1884.—His Royal Highness the Duke of Cambridge, K.G., has consented to open this exhibition, on behalf of the president, his Royal Highness the Prince of Wales, on Thursday, the 8th of May, at noon.

DISCOVERY OF A ROMAN ALTAR AT LINCOLN.

PRECENTOR VENABLES writes to a local newspaper that on the 26th ult., in digging the foundations of the new tower of St. Swithin's, Lincoln, the workmen discovered a very perfect Roman altar:-

"It stands 3 ft. in height by 1 ft. 8 in. in breadth at the base, and 1 ft. 3½ in. in the upper part; the corresponding depths are 1 ft. 2 in. and 12½ in. It is hewn out of a single block of oolite, of the same bed from which the Roman arch at Newport Gate was built, and belonging probably to the same period,—perhaps early in the second century of our era. The upper part is unfortunately mutilated, and there are hardly any traces of the basin-shaped *calyx* or *apex* in which the sacrifice was consumed. Each side is carved in low relief; the right-hand side bearing the *præfixculus* or pitcher containing the wine for the libation, the left-hand side the *patena* or shallow dish used for pouring the wine upon the offering. The sacrificial knife, which is a usual companion of these vessels on Roman altars, is wanting. The inscription on the face is happily perfect, the letters being very sharp as the day they were first cut. It is as follows:—

PARCIS, DEA
EVS. ET. NV
MINIVS. AUG
C ANTIVSIVS
FRONTINVS
CVIATOR. TER

AR. D. S. D.

Which may be thus rendered:—"To the goddesses, the Fates, and to the Deities of Augustus, Caius Antianus Frontinus, being curator for the third time, erects this altar at his own cost." The last three letters are a common contraction for '*de suo dat.*' Hilberto only three altars dedicated to the Fates, or Fates, have been found in Britain: at least only three are recorded in Hibbert's great work. All of these belong to the Carlisle district, two found in Carlisle itself, and one near Silloth. In two of these the Fates are designated as 'Mothers,' '*Matribus Parcis*,' not 'Goddesses,' as here."

THE ADMIRALTY AND WAR OFFICES COMPETITION.

SIR,—According to their joint letter, which appeared recently in the *Times*, Messrs. E. W. Godwin and J. P. Seddon seem to think the public will be interested to know that they "fail to find the name of one architect of eminence in the list of those provisionally selected in the competition for the new Government Offices."

They further do not hesitate to state that the competition in question is but a "cleverly-arranged scheme," by which results "the absolute prohibition of any first-rate architect from being employed." These gentlemen subscribe themselves "Non-Competitors," a fact which will not suffice to convince unprejudiced people that first-rate men have not competed.

Schemes of competition, no less cleverly arranged, have on former occasions resulted in bringing to the front architects such as those who designed St. Nicholas Church, Hamburg; the Houses of Parliament; St. George's Hall, Liverpool; the Scott Memorial, Edinburgh; and the Cathedral for Lille. Under like competitive influences bearing upon the arts of painting and sculpture success at once brought eminence to John Foley, Alfred Stevens, and G. F. Watts. Many other instances might be quoted to prove that in the "untried fish," which Messrs. Godwin and Seddon do not scruple to sneer at, may be recognised eventually the ablest talent of the country.

From certain architects, in and out of season, one hears claims at *nauseum*, on what is called "the dignity of the profession."

The profession will now know how to value the chivalry of its members who can combine to cast a slur on their brethren whose competitive efforts are still *sub judice* at the hands of those whose competence and honour are beyond impeachment.

ANOTHER NON-COMPETITOR.

RESTORATION AND ANTI-RESTORATION.

SIR,—For some years I have been a member of the Society for the Protection of Ancient Buildings. I have ever had strong natural sympathies with its origin and its aims, and its first primary object, and although the Society has almost altogether lacked that practical element which would have gone so far to increase its utility and value, I am loth to think that it has done no good. Whenever I drive from Marlborough to Avebury, in Wilts, and note the wilful destruction going on of those wonderful Druidical (may I call them so) remains, which are, from time to time, systematically cracked up to mend the roads, I certainly do think the Society remiss in not doing their best to get these most interesting stones preserved. Further, when, ever and anon, I hear that, by a lack of tact rather than of good will, the Association has done harm in places where it meant to do well, I have still comforted myself with

the belief that it was true at the core, and so, with all its faults, I lived it still.

From time to time,—and so recently as the present year,—I have been consulted by the Society upon matters appertaining to proposed works, more especially in the West of England. In each instance I have diligently made inquiries, and having found invariably that such undertakings might be safely entrusted to the care of the respective architects into whose hands they were placed, I have had pleasure in testifying to that fact, and by my assurances have stayed useless and, perchance, vexatious action. My subscription for the present year is paid, and only quite recently I received a pressing appeal from the Secretary, asking me, as the funds of the Society were much strained, to increase the amount of my annual payment. Taking all these facts into consideration, therefore, I was exceedingly surprised to read in your issue of the 5th inst. the long correspondence which has taken place, unknown to myself, between the Society and Mr. Henry Hicks Gibbs, relative to the restoration I have at present in hand,—thanks to Mr. Gibbs's unbounded liberality and pious generosity,—of the high altar screen in the choir of All Saints Church, Exeter. As a paying member, as one whose opinion is sought for and acted upon, it would have been at least courteous of the committee to have first put themselves into communication with me, as one of their own body, and inquire what the contemplated work entailed.

It can scarcely have been by anything but the grossest ignorance, or by an actual perversion of facts, that upon February 12th the Society wrote to Mr. Gibbs and informed him that "Restoration is . . . the positive material alteration of ancient surfaces, caused by cleaning, re-tooling, and that general smartening up which is always one of the objects of restoration."—and thus many of the committee know perfectly well that I do not alter ancient surfaces, and that I am not accustomed to re-tool any old work entrusted into my hands.

Precisely a month later (March 12th) the committee wrote Mr. Gibbs further, saying:—

"You may, perhaps, have found an unknown carver informed with the same spirit as his predecessors of the fifteenth century, endowed with the fruitfulness and knowledge a wise association for mutual help gave them in the application of natural principles to the development of a consistent and beautiful architecture; he may be heir to this spirit, and amidst all the deafening influences of an unsympathetic time of isolated work and competitive prices, may have cultivated the precious seed of Medieval art to burst once more into bloom over this ancient screen."

I mean to say boldly that this withering sneer at any existing ambitious or possible artistic power in one of its own members is so contemptible and so utterly unworthy of the action of any body of gentlemen, that I cannot bring myself to believe that the great majority of the members know any more of what was written than I did myself.

HARRY HEMS.

Fair Park, Exeter, April 10th.

STRAINS IN FRAMED STRUCTURES.

SIR,—I have just had my attention called to your review of my recent work, entitled "Strains in Framed Structures," given in your issue for Feb. 23rd (p. 256).

I wish, first, to thank you for your favourable estimate of the work, and then to notice a few points made in the review which need, I think, some correction.

The "series of plates" to which you allude, and which treat graphically "almost every conceivable form of iron-roof truss," are taken bodily, without change, from Prof. R. H. Bow's admirable work, "Economics of Construction," and will be found duly credited to him. His system of notation is also used throughout the work. So much in justice to one whose labours in this direction are as well known upon this side of the water as in his own country, and to whom I am under special obligations.

As to the braced arch, you entirely misstate my position, without in the least intending to do so, and then devote nearly four columns in order to show my error, and quite unconsciously come to precisely the same conclusion which I had already stated.

You credit me with saying that in the case of the braced arch, continuous at crown and fixed at the ends, "the resultant pressures do not pass through the ends of the arch where four columns in order to show my error, and quite unconsciously come to precisely the same conclusion which I had already stated."

As these words are put by you in quotation marks, the natural inference is either that they are my identical words, or at least a correct paraphrase. You will probably be surprised to learn that they are in reality neither. Yet such is the case. You cannot find in my work either these words, or anything to justify such an interpretation. What I really do say (page 163) is, that "the reactions no longer pass through the ends of the arch, but pass through points above or below the ends."

A comparison of these words with your interpretation (for it is impossible that you intended it as a literal quotation, notwithstanding the quotation

marks) reveals at once the difference and the reason for it.

From a hasty reading you apprehended only a portion of what was said. Under this misconception you then proceeded to show that the reaction may sometimes pass above the ends, which, so far from denying, as you evidently think I do, is precisely what I state. Thus the entire point of discussion, to which you devote nearly four columns to set me straight, has no real existence, but is entirely based upon making me say that which I have not said.

What I have stated, and desire now to state again, is, that for a *flat, parabolic arch, of uniform section, continuous at crown, fixed at ends, and of invariable span*, the point of intersection of any single weight with a horizontal line situated at one-fifth the rise of the arch above the crown, will give a point in both the resultant pressures. Also, that this point thus known, the *directions* of these pressures are given by drawing them through the point thus determined and *tangent to a hyperbolic arc*, which I have shown how to construct and locate. This is susceptible of rigid demonstration, and I do not elsewhere deduce it. The resultant pressures being thus determined, it will be found, as I have correctly stated (and you have incorrectly reported), that they will always pass either "*above or below*," but never through the ends of the arch.

Whether, in the cases you discuss and illustrate, both pressures will pass above the ends (as you have represented), or one above and one below, or both below, will depend upon the special dimensions, position of load, &c., and can, in any special case, be best determined by applying the very construction I give, and which you are only apparently criticising.

In so far, therefore, as your statement imputes to me that which I do not say, and your discussion assumes implicitly that my construction does not cover the case to which it is applied, it seems to me that both statement and discussion need correction.

As to the proper location of the neutral axis in the case of a beam, your position is undoubtedly correct; but I venture to think that your estimate of the error committed is excessive. The assumption that the neutral axis passes through the centre of gravity is, as you point out, only correct (theoretically) in the case of symmetric sections. It may, however, be justifiable in others. The fact, which you also notice, that all authors make this assumption would of itself indicate either that all have blundered, or else that they have disregarded as a nicety that which has no practical effect. The latter conclusion would seem the most probable.

This that is, in fact, the case I think your own examples show. In the case of the triangle, the moment of inertia about the axis through the centre of gravity is $\frac{bh^3}{36}$ and the axis is at two-thirds the

height, or $\frac{66}{100}h$ from the apex. When the neutral axis is properly located as you suggest, it lies at a distance from the apex of about $\frac{64}{100}h$ instead of $\frac{66}{100}h$, and the moment of inertia is $\frac{bh^3}{35.3}$ instead of $\frac{bh^3}{36}$.

If we take, as you say, the moment of resistance equal to the moment of inertia "divided by the maximum distance of any of the matter in the cross-section and multiplied by the elastic strength per unit of area," we have, in the second case, the correct moment of resistance $\frac{bh^2c}{22.6}$ and in the first case $\frac{bh^2c}{24}$, an error of about 6 per cent. instead of "12 per cent."

Again in your other example, the moment of inertia is correctly $\frac{10}{3}$ while the usual method gives $\frac{14.8}{3}$.

The moments of resistance are then, according to your rule, 2.68 and 2.46, giving an error of $\frac{1}{3}$ per cent. instead of "43 per cent."

When we remember that the theory of flexure is based upon several other assumptions, quite as questionable as the one you take exception to, the influences of which are quite as great, and which are still accepted, we can perhaps accept this one also. As a matter of fact, the neutral axis is *not* at the centre of gravity even of symmetric cross-sections. We merely assume that it is, because the error is slight, and abundantly covered by the "factor of safety." For the same reasons we accept the same assumption for unsymmetric sections. Practical designing, and the accepted theory of flexure, would remain entirely unaffected by the introduction of such a correction as you suggest, while the resulting formulae and methods would be greatly increased in complexity and labour. The determination of the deflection, breaking-weight, &c., as well as of the neutral axis, would be, as you say, "always a difficult matter," without any compensating advantages. A. J. DU BOIS.

Sheffield Scientific School of Yale College,
New Haven, Conn.,
March 31st, 1884.

. The quotation was not intended to be the exact words used by the author, but merely a

concise summary of their meaning (page 165, fig. 143).

The only amendment the quotation seems to require is the addition of the word *above*, so as to read *above and below*. Although the author attaches great importance to this, and founds the whole of his complaint on this omission, it in no way affects our observations. Fig. 143 shows both thrusts passing below the ends of the arch, which is impossible according to our view. The space we devoted to the subject was, as stated at the time, to guide the student and future writers on the subject, not, as the author supposes, to set him straight. It appears to us that a correct theory would be equally applicable whatever the proportion between the rise and span of an arch. That there is an essential difference between us is evident. The author says that "they (the thrusts) will always pass above or below, but never through the ends of the arch." We say that both thrusts cannot pass below, and one may pass through an end.

With respect to the position of the neutral axis, we are pleased to see that the author admits the accuracy of our theory. It is not, however, correct to assume that authors have generally disregarded a nicety because it has no practical effect. On the contrary, many have taken great pains to prove that the neutral axis passes through the centre of gravity. Nor is the resultant error so slight that it may be neglected. The error in the triangular section will be found to amount to 12 not to 6 per cent.; and in the inverted L, if calculated by moments, to 47 per cent. instead of 7½. We might have taken examples which would have given preposterous errors.

ROYAL EXCHANGE.

SIR,—It is deeply to be regretted by every lover of Classic work that in fixing the new iron roof over the quadrangle it should be found necessary to remove the open ornamental parapet around the four sides of the interior quadrangle, as designed by the late Sir W. Tite, assisted by Professor Cockerell, in his life-time.

It has been said that the works of the architect, like those of the musician, are eternal. But this comfort and consolation architects have had in the past is being, by this restless age,—which craves more for novelty than for sound substantial work and design,—fast swept away for ever, whilst buildings done by Cockerell, Tite, Wren, Hawksmoor, Kent, and Gibbs (also Inigo Jones) are in danger of having all their original features utterly defaced, if not the original work swept or improved off the face of the earth.

You have only to take the inside of the church of St. Paul's, Covent Garden, for an illustration of what I say.

"TITE."

ANTS IN HOUSES.

SIR,—The often-asked question again appears on page 528 of last week's number, namely, "How to get rid of Ants in Houses?" More remedies have been given than the number of times the question has been asked, but still your correspondents "want to know, you know."

Two parts of the house in which I am now living were suddenly discovered to be infested with these little animals, but great pests. I amused myself two or three hours for several nights by catching them with a small brush, dipping the same in water in a puddling-basin with a spirit-lamp under to keep the water as hot as possible. Hundreds and hundreds I caught and scalded in this way, but still the enemy did not decrease. When, one night, my knees having had long enough acquaintance with the floor, a sudden thought came over me, or, as some would say, a spirit whispered to me, "Why not try Keating's powder?" The powder was obtained from head-quarters. The enemy's camp was reached as near as possible, and was well peppered, as also were their meeting-places and promenades. After a couple of days' enjoyment,—or otherwise,—of the powder, the enemy was discovered as little black specks distributed over the field of battle as thickly as the Arabs were lately told of. My enemies I swept up and cremated, but did not urn the remains. I only earned the pleasure of getting rid of them, for now none are to be seen.

In proposing any speciality for a remedy it is generally supposed or said, "Oh, he is only advertising his own wares!" But you, Mr. Editor, will know that I have not any interest in the above powder or the inventor, but merely desire to place before the public a happy thought which has turned out, in my case, a remedy for an evil.

Y.

New Congregational Church, &c., Hampstead.—Messrs. J. L. Bacon & Co., of 34, Upper Gloucester-place, Dorset-square, have been entrusted with the erection of the apparatus for the warming and ventilation of these buildings, which were referred to in our last.

DISSENTING CHURCH-BUILDING NEWS.

Trowbridge.—The new Tabernacle at Trowbridge was opened on the 19th ult. The style adopted by the architects is Perpendicular. The new west front of the Tabernacle extends 20 ft. beyond the old one. The external walls are of Bradford (Wilts) stone, faced with random-coursed work. The dressings are of a superior freestone from the district. The roofs are slated. The total cost of reconstructing the chapel, remodelling the school-buildings, and building ten new class-rooms, including all outside work to the extensive premises, all furniture, the organ and stained-glass, and architects' commission and salary of clerk of works, is 8,400l. The stained-glass and ornamental glazing and colour decoration are by Messrs. Campbell & Co., Newman-street; gas-fittings, J. Stone, St. George's-road; blinds, Guyman & Son, Carburton-street; marble mosaic, Pattesons, of Manchester; umbrella-holders, Nettleford & Sons, High Holborn; organ and case, W. Sweetland, Bath. The architects are Messrs. Paull & Bonella, of 2, Chancery-lane, London, and Manchester.

Morpeth.—On the 1st inst. a new Wesleyan Methodist chapel was opened in Manchester-street. The building occupies the site of the former chapel and of a caretaker's house which adjoined it. The ground slopes rapidly from front to back, and advantage has been taken of this to obtain, in the basement, a schoolroom 36 ft. by 23 ft., together with a large vestry and class-room. To give sufficient height to these rooms the floor of the chapel is raised 5 ft. above the street level. The chapel is seated for 360 persons, and the entire cost is 1,600l. The warming apparatus is by Messrs. Dinning & Cooke, of Newcastle; the gas-fittings by Messrs. Jones & Willis, of Birmingham; and the ventilation by one of Boyle's air-pump ventilators. The lead glazing is by the Gateshead Stained Glass Company. The contractor for the whole is Mr. D. M. Spence, of Amble, and the architects are Messrs. S. Oswald & Son, of Newcastle-on-Tyne, under whose superintendence the work has been executed.

PROVINCIAL NEWS.

Newcastle-on-Tyne.—The Young Men's Christian Association having purchased St. James's Congregational Chapel, Blackett-street, vacated by the removal of the congregation to their new church recently erected in Bath-road, are about to convert the same into premises for the use of the Association. The basement will contain a restaurant (to be conducted on temperance principles), with retiring-rooms for ladies and gentlemen; and also a gymnasium, with dressing-room, bath, &c. The principal floor will comprise reading-room, parlour, class-rooms, secretary's office, retiring-room, &c. The top floor will be a new one, constructed about the level of the former galleries, and will be entirely devoted to a large hall (with ante-room) for public meetings, accommodating nearly 500 people. The architects are Messrs. S. Oswald & Son. The contractor for the structural work is Mr. Sidney Millard. The plumbers' work will be done by Messrs. Walker & Emley, and the painting and glazing by Messrs. J. Richardson & Co., all of Newcastle.

—The High Gosforth Park Company are erecting near the grand stand at their race-course additional stabling for thirty-six horses; chiefly in boxes, although a few stalls are provided. This is the first part of a scheme which will ultimately provide for 100 horses, in addition to existing accommodation for about eighty. The scheme also includes dormitories and mess-rooms for about 200 stable boys in a large detached block. The builders are Messrs. G. Simpson & Son, and the architects are Messrs. S. Oswald & Son, of Newcastle.

Exeter.—At the Town Council meeting on the 9th inst. an animated discussion took place as to whether the heating and ventilating arrangements for the New Panper Lunatic Asylum for the city should be handed over to Mr. Phipson, C.E., to carry out personally, or whether Mr. Phipson should be employed professionally to only superintend, and the work tendered for in the usual manner. Mr. Phipson estimated the entire cost at 6,235l., and was prepared to guarantee its completion for that sum; or, he was ready to direct the carrying out of his scheme, charging 5 per cent. on the outlay and 3l. 3s. a day and expenses.—Councillor Fidler

pointed out that they had to pay 5 per cent. on all this work to their architect, Mr. R. Stark Wilkinson; 1 per cent. to Mr. Fred. R. Smith, the quantity surveyor; and now they were asked to pay another 5 per cent. to the engineer, making 11 per cent. for what he deemed was only part of the architect's legitimate work.—Councillor Harry Hems pointed out that the ventilating, &c., was decidedly a speciality, and work for a civil engineer rather than for an architect. But, it struck him as derogatory to the profession that Mr. Phipson should want both to make the plans and do the work! He thought an able engineer would be found in Mr. Phipson, and a good working firm of engineers might be entrusted to carry out that gentleman's designs.—Alderman Huxtable (a retired builder) said they had no specifications or bills of quantities, and he objected decidedly to giving an order for the work without knowing what was to be done for the money. He considered that all public work should be tendered for.—It was stated in the course of further discussion that the architect (who is son of the present mayor) was strongly in favour of Mr. Phipson doing the work *in toto*, and that he (Mr. Wilkinson) asserted that not a stone of the foundation of the new asylum could be put in until this necessary matter was settled.—It was ultimately decided by a vote of fourteen to eight that Mr. Phipson should be entrusted with the work at a cost of 6,235l.—Some conversation afterwards took place relative to Mr. F. Smith claiming to be paid, as a matter of custom, his percentage for quantities upon the amount of the engineering work, although he had had nothing to do with it. He made his charge upon the entire sum of contract. It was finally agreed to pay him this, *i.e.*, 1 per cent. upon the amount of amended tender, 55,700l.

SCHOOL-BUILDING NEWS.

Great Harwood.—New Schools are about to be built at Great Harwood, near Blackburn, in connexion with the Methodist Free Church. The buildings will be used for day and Sunday school purposes, to accommodate 1,000 scholars, and will consist of a large school-room with seven class-rooms adjacent thereto and an infants' school for 150 infants. The plans have been prepared by Messrs. Maxwell, Tuke, & Hurst, architects, Southport, and the works will be carried out under their supervision.

Chatham.—New Schools for St. Paul's parish at Chatham, have been opened by the Bishop of Rochester. The architect was Mr. R. Willey, of Ludgate-hill, London, and the builder was Mr. Dorsey, of Brentford. We are informed that the cost of these schools was at the rate of 3l. 10s. per child only, exclusive of site.

Earlestown.—A lecture-hall and Sunday-schools are about to be built in connexion with the Primitive Methodist Chapel, Earlestown, near Warrington. The buildings will comprise a hall capable of seating 500 adult persons, five class-rooms for twenty scholars each, an infants' room for sixty infants, and a library. Separate yards and offices will be provided for boys and girls respectively. The plans have been prepared by Messrs. Maxwell, Tuke, & Hurst, architects, Southport, and the works will be carried out under their superintendence.

Manchester.—The extensive schools belonging to the Wesleyans, at the southerly end of the City-road, Manchester, are about to be considerably enlarged, from the designs of Messrs. Medland & Henry Taylor.

Books.

Older England, illustrated by the Anglo-Saxon Antiquities in the British Museum. By J. FREDERICK HODGETTS. London: Whitting & Co. 1884.

It was a happy thought on the part of Mr. Hodgetts to give animation to the dead objects which fill some of the glass cases in the British Museum and make them tell the tale of their almost forgotten existence. He had the good fortune, also, to secure an intelligent audience, and he quotes with evident pride Mr. Ruskin's remark that what he had heard from the lecturer's lips had been a new revelation of truth and poetry for him,—overturning some of his most cherished opinions, but substituting for them a fresh field of thought. No doubt there is an element of poetry in all

scientific and historic research. We may almost say that men like Newton and Darwin were discoverers by virtue of possessing a share in the same divine faculty which found other expression in Dante and Milton. Mr. Hodggets is not without it; and, perhaps, we may refer to poetical exuberance the flights of fancy which he occasionally takes in the region of etymology. On the whole, however, even from a perusal of these lectures, one gains a very distinct impression of the life and circumstances of our old English ancestors; and we may, therefore, congratulate Mr. Hodggets not only upon having made the head of Memnon vocal, but on having provided it with chords that are, in the main, true and harmonious. The author's method of "handling" his subject is very simple. He takes up some relic of past times—a sword, a brooch, or a ring,—and discourses thereon according to no settled plan, but in an easy and communicative way. Of course the very name or names of the object are often full of suggestions. Thus the word "sword" contains a wealth of meaning which seems almost inexhaustible. "The root *swer* brings us farther and farther into the gulf of time, and shows us the sense of shining, gleaming, flashing, and, more remotely, *heaven*, which in the grand old speech of the far East is called the *Svarga*. To vow to heaven, then, was to swear; Swedish, *svärja*; English, *swear*; German, *schwören*. Now, the thing that bound a king to his God, an earl to his king, and a vassal to his earl, was the symbol of power, of truth combative, of protection, and of glory,—all which attributes reside together in the sword alone. Hence the very name is cognate with the root expressive of the brightest hope of human life, and so with death and brighter life beyond the tomb. 'He sweareth' means 'he takes his sword and vows to heaven a solemn oath upon it.'"

We cannot help thinking that this, however pretty, is just a little fanciful; and we like Mr. Hodggets better when he is telling us some facts about the history of the weapon which he has gleaned from divers sources. The old English sword was a massive, weighty, double-edged weapon, with a cross-guard curving downwards. The grip, or hilt, was of wood, bound with leather, and often profusely ornamented with gold. It was one of the treasures of the house, and bore some name descriptive of its virtues. It was a vastly more powerful weapon than the Roman sword; and its descendant, in an elongated form, is the *longue épée* of the thirteenth century, with which monumental remains have made us familiar. In the latter, however, the slight projections at the hilt have become prolonged, and thus we get the straight cross-guard,—the divine emblem,—which often brought courage and consolation to the dying Crusader.

Mr. Hodggets says that the sword in art has not been sufficiently utilised as a means of decoration. The grouping behind the warrior's seat of the weapons which he used could not fail to be picturesque; for the most haphazard arrangement,—spear, and shield, and sword,—invariably gives, we are told, effective combinations of form. Mr. Hodggets may be right, but the opportunities for making the experiment are not likely to be numerous, and we should strongly object to the employment of old English weapons to decorate the hall of a red-brick mansion of the now prevailing style.

The form of the ancient English shield was generally circular, with the boss in the centre. It was concave, so as to cover the breast and shoulder, and so constructed as to leave an aperture for the hand to grasp the bar of wood which formed the handle. Over this aperture was the boss which, by its projection, guarded the hand. Within, the shield was lined with cloth or leather stretched over the woodwork, which was light linden. Outside a rough hide was nailed and bordered by a rim of gilt leather, bronze, or even gold. Mr. Hodggets thinks that the scroll-shaped shield which Strutt and Meyrick depict had no existence except in the fancy of the Humer. But, besides the round shield, or buckler, there was another defensive arm known as the *scild-bruma*, or troop shield. This was of an oval shape, and large enough to cover the whole person, the lower extremity of it resting upon the ground.

The subject of the brooch gives Mr. Hodggets an opportunity of speaking about the condition of women in older England. Of course he draws special attention to what, with pardonable exaggeration, he calls "the almost awful respect for woman" which from the earliest historic

period has been the characteristic of the Scandinavian race. What was effected for the Latin nations by the cultus of the Virgin Mary and the softening influences of Christianity belonged to the barbarian Teutons by nature. We wonder that the modern advocates of women's rights in this country have not made more of the argument from antiquity, and pointed to the exclusion of women from the senate and the ministry as tokens of degeneracy. "The German women were admitted into the councils of the men; they were consulted on all important business, especially on such matters as had proved too tough for the sword-like intellect of the men to cut through. Consequently, we find ten priestesses to one priest! We find our fathers listening to the advice of women upon all possible occasions, and thoroughly believing in them." In the last respects we are not disposed to admit that younger England has greatly changed.

The archaeological information with which these lectures abound makes them valuable to the student, and a good many popular errors in reference to our remoter ancestors are clearly exposed. For instance, the cruciform piers often found in East Anglian graves have been thoughtlessly supposed to owe their shape to Christian influences. Mr. Hodggets, therefore, does well to point out that the cross in not a Christian invention, and that cruciform ornaments were in vogue long before the date of the Crucifixion. Their existence, as well as the existence of well-wrought jewellery, urns, and utensils establish the fact that English art is not due to Roman teaching, but is English in its origin.

The Nationalisation of the Land. By Samuel Smith, M.P. London: Kegan Paul & Co. 1884.

Fallacies of Socialism Exposed. By Samuel Smith, M.P. London: W. Reeves. 1884.

National Progress and Poverty. By Samuel Smith, M.P. London: W. Reeves. 1884.

THE three publications which appear at the head of this notice are each from the pen of Mr. Smith, the Liberal member for Liverpool. They are refutations of the Socialistic opinions expressed by Mr. Henry George, Mr. H. M. Hyndman, and Mr. A. R. Wallace, who are doubtless as well meaning in their intentions as they are mischievous in their views. Any one who desires to see Mr. George's arguments shortly, clearly, and ably exposed cannot do better than read these papers, especially the one on "The Nationalisation of the Land." Mr. Smith is not only a theoretical political economist, but a capable and experienced man of business, and, we confess to our surprise, writes in a bright and manly polished style than the majority of so-called literary men. It is impossible for us to enter at length into an examination of these pamphlets, because being short in themselves they will hardly bear compression. Mr. Smith shows very clearly that "the first conditions of all national progress are security for life and property," and then he demonstrates how nothing "could be more destructive of the social welfare of any old and peaceful country than to tear up the foundation of all property by disputing existing titles to the soil." Another point which is often overlooked by socialistic adherents is made by Mr. Smith, namely, that by a confiscation of landed property, not only would owners of land be defrauded, "but likewise all the mortgagees, whose name is legion," and, as he points out, "the sole livelihood of multitudes of widows and orphans depends on trust-money" invested on the security of land, and if land is confiscated the security of these persons is gone, and without it their means of subsistence. To any one who has at all carefully considered the plans of the socialists, to repeat Mr. Smith's arguments is like unto the doings of the man of whom it is said that "thrice he slew the slain." The calm reasoner does not require the assistance of Mr. Smith's arguments. But there are hundreds of persons who have not the time or inclination to think out those matters for themselves, and to these we very earnestly commend the perusal of Mr. Smith's publications.

HEANOR.—A Munich east window has just been erected in the parish church of Heanor, Notts, by Messrs. Mayer & Co. The subject illustrates the text, "Come unto Me, all ye that labour."

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

April 4.—5,928, J. E. Doughty and P. Krasieleh, London, Automatic Ladder Machine for Builders' use.—5,931, R. M. Ormerod, Carlisle, Forming Domes and Circular Buildings in Concrete and Plaster.—5,940, A. B. Merrick, Exeter, Draining Roofs.—5,962, H. R. Hughes, London, Flower-pot Window-guard.—5,963, J. C. Hudson, London, Fireproofing Ceilings.

April 5.—5,969, A. W. Kershaw, Lancaster, Downcast Ventilators.—5,979, J. Jarman, Birmingham, Cleaning Chimneys.—5,983, R. T. Bells, Birkenhead, and T. B. Stott, Rockferry, Window Fastenings.—6,006, J. C. W. Rolfe, London, Blinds for Ventilating.—6,011, G. Connell, Newcastle-upon-Tyne, Ventilating and Air-warming Apparatus.—6,014, W. Cowell, Blackburn, Ventilator.—6,019, J. Kerr, London, Pavements.

April 7.—6,037, T. Grimbleby and H. Grimbleby, Barrow-under-Humber, Lock-wing Roofing-tiles.—6,045, Z. Levy, London, Ventilator.—6,061, F. Mann, London, Sash-fastener.

April 8.—6,101, H. Hughes, London, Disinfecting Sewers.—6,102, H. Hughes, London, Purifying Water for Houses, &c.—6,107, G. Greig, Harrieston, Ventilating Apparatus.—6,114, J. Cottrell and R. Oakley, London, Ventilation, &c.—6,117, S. S. Phillips and H. F. Green, London, Gully for Drains, &c.—6,118, S. S. Phillips and H. F. Green, London, Gully for Drains, &c.—6,121, J. Tomkins and S. Napper, London, Baths, Lavatories, &c.—6,127, T. Durran, London, Water-closets, &c.

April 9.—6,146, G. E. Newton, London, Water-cisterns.—6,171, C. W. Lee, London, Painting upon Glass.—6,178, T. Brown, Penicuik, Chimney Cows and Ventilators.—6,180, F. P. Preston, J. T. Prestige, and E. J. Preston, Deptford, and E. W. De Russett, Croydon, Water-closets.

April 10.—6,231, E. G. Capon and H. Heaton, King's Norton, Compound Material for Covering Steps, Stairs, Passages, &c.

SPECIFICATIONS ACCEPTED.†

April 8.—945, F. R. Wildgoose, London, Sash fastenings.—4,306, A. Emanuel, London, Water-closets.

April 11.—3,274, S. H. Adams, York, Water-closets.

NOTICES TO PROCEED

Have been given on the *Date first named*.

April 8.—5,640, H. Darby, London, Apparatus for Warming Air for Heating Buildings, &c. (Dec. 4, '83).—5,650, R. Hall and C. C. Woodcock, Leicester, Wood-paving (Dec. 5, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending April 12, 1884.

3,870, C. J. Dobbs, Middlesbrough, Manufacture of Paving Blocks from Furnace-slag (Aug. 9, '83, price 6d.).

When the slag has been run into the moulds the blocks are removed as soon as they are set and placed in a kiln, in which are a number of chambers, each of which can contain one block. The blocks are then annealed without any extraneous heat.

3,947, H. Sutton, London, Brushing Apparatus for Cleaning the Walls, Ceilings, &c., of Buildings (Aug. 14, '83, 2d.).

A circular brush is mounted on the end of a rod and rotated by a crank near the handle. (Pro. Pro.)

3,951, T. S. Truss, London, Traps (Aug. 15, '83, 2d.).

The inlet-pipe into the trap-box is curved upwards, and on the end is a valve. The rush of liquid through the pipe lifts the valve, which falls again into its seat when the rush has stopped. (Pro. Pro.)

3,964, P. Jensen, London, Kitchen-stove Plates. Com. by F. Kohl, Vienna (Aug. 15, '83, 2d.).

Instead of being made in one single piece, these plates are composed of four separate pieces connected together by grooves and tongue joints.

4,051, J. P. Rickman and A. B. Wood, London, Tesserae for Mosaic Work, &c. (Aug. 21, '83, 2d.).

These are made with flange to secure them in the matrix or bed. (Pro. Pro.)

4,127, G. M. Edwards, London, Metal Tables for Ceilings, Partitions, &c. (Aug. 27, '83, 8d.).

Thin strips of sheet iron are used with notched or serrated edges, and in the centre thereof lengthwise is formed a deep groove indented in the metal. The strip is fastened by this groove to the joists, &c., and embedded in the plastic material.

4,150, G. Connell, Newcastle-upon-Tyne, Window-ventilators (Aug. 28, '83, 6d.).

A glazed framing is attached to the window, thereby forming a double window with a chamber inside; and hinged flaps are fitted in the upper and lower parts of this double window. A metal chamber with gas jets is formed below by which the air can be heated and a circulation established in the glazed chamber. By arranging the flaps accordingly air can be passed into or withdrawn from the room, &c., as may be required.

4,213, S. B. Sutcliffe, Manchester, Tile Hearths and Fenders (Sept. 1, '83, 6d.).

The outside of the tile hearth is surrounded by an edging inside of which and sloping down towards the tile-hearth are ornamental tiles.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

4,227. T. J. Palmer, Carshalton, Decorative Material for Walls, &c. (Sept. 3, '83, 64.).
The pulp is passed through a series of rollers on blankets first and then on wire gauze to express all the moisture, and afterwards through other rollers to emboss the required pattern on the material.

MEETINGS.

SATURDAY, APRIL 19.

Architectural Association.—Visit to Houses in Kensington Court (Mr. J. J. Stevenson, architect). 3 p.m.
Edinburgh Architectural Association.—Visit to Hallyards Castle and Kirkcaldy.

MONDAY, APRIL 21.

Royal Institute of British Architects.—Business Meeting, for Members only, and Special General Meeting. 8 p.m.
Surveyors' Institution.—Mr. T. Chatfield Clarke on "Improved Dwellings for Labourers and Artisans." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Adjourned Discussion on Dr. P. F. Frankland's paper on "The Upper Thames as a Source of Water Supply." 8 p.m.

Leeds and Yorkshire Architectural Society.—Members' Soiree.

London and Middlesex Archaeological Society.—(1) Mr. Thomas Milbourn on "London Clubs." (2) Mr. John E. Price, F.S.A., "On the Recovered Monumental Brass of Sir John Popham, Knt. 1643, with Notes on his connexion with the Church of St. Sepulchre, London." 8 p.m.
Victoria Institute.—Mr. S. R. Pattison on "Evolution and the Pearly Nautilus," or the Rev. J. M. Mello, F.G.S., on "The Prehistoric Factory of Flints at Spaines." 8 p.m.

TUESDAY, APRIL 22.

Institution of Civil Engineers.—Mr. W. E. Rich, M.Inst.C.E., "On the Comparative Merits of Vertical and Horizontal Engines, and on Rotative Beam Engines for Pumping." 8 p.m.

St. Paul's Ecclesiological Society.—Dr. W. G. F. Phillips, O.C., on "The History of the Ecclesiastical Courts." 7.30 p.m.

Anthropological Institute (3, Hanover-square).—(1) Sir Richard Owen on a portrait of an Aboriginal Tasmanian. (2) Professor A. H. Keane on "The Ethnology of the Sudan." 8 p.m.

WEDNESDAY, APRIL 23.

Society of Arts.—Mr. J. B. Redman, M.Inst.C.E., on "Thames Communications." 8 p.m.
Civil and Mechanical Engineers' Society.—Mr. H. M. Whitley on "Modern Locomotive Practice." 7 p.m.

THURSDAY, APRIL 24.

Parkes Museum of Hygiene (74a, Margaret-street, W.). Dr. Voelcker on "Milk." 5 p.m.

Royal Institution. Professor Dewar on "Flame and Oxidation." (1) 3 p.m.

FRIDAY, APRIL 25.

Royal Institution.—Mr. Walter Besant on "The Art of Fiction." 9 p.m.

Society of Arts (Indian Section).—Mr. W. G. Pedder on "The Existing Law of Landlord and Tenant in India." 8 p.m.

SATURDAY, APRIL 26.

Artists' Benevolent Fund.—Seventy-fifth Anniversary Dinner (Freemasons' Tavern, Sir Coutts Lindsay in the chair).

St. Paul's Ecclesiological Society.—(1) Visit to the Priory of St. Dominic, Maitland-road, Haverstock-hill. 2.45 p.m. (2) Visit to the Church of St. Augustine, Kilburn, under the guidance of Mr. J. L. Pearson, F.S.A. 4 p.m.

Royal Institution.—Mr. Horder M. Westropp on "Recent Discoveries in Roman Archaeology." (1) The Colosseum. 3 p.m.
Birmingham Architectural Association.—Mr. W. Tonks on "Exhibitions and Museums."

Miscellaneous.

Rebuilding of an Old City Tavern.—The Salutation and Cat Tavern, in Rose-street, Paternoster-square, has just been rebuilt, one of the chief features in the reconstruction being the decorations of the interior. The old tavern was destroyed in the great fire in Paternoster-square, two or three years ago. The Rose-street frontage of the new building is limited to 19 ft., but the ground area occupied by the building is nearly 5,000 ft. The upper part of the elevation is faced with red-pressed brick, the arched windows having terra cotta keys. Amongst other apartments in the basement is a spacious billiard-room fitted in American walnut, the mural decorations of the apartment consisting of ornamental tiles and mirrors. The apartments on the ground-floor consist of a large grill-room, also coffee and smoking-rooms, public and private luncheon-rooms, all richly decorated. This floor is entirely fire-proof, being of concrete on Dennett & Igle's principle. The first-floor contains a large banquetting-room, the walls being painted in panels and decorated with mirrors. On the same floor is a Masonic temple, having a domed ceiling, with sun-light in the centre, the walls being decorated with emblems representative of the craft. On this floor there are also several private dining and reception-rooms. Messrs. Wyllson & Long, of King William-street, Strand, are the architects, and Messrs. Pickersgill Bros. the contractors; Mr. Smith is foreman of the works. The estimated cost of the building is about 16,000l.

The Difficulties of Tunnel Construction.

The questions of the heat of the earth and the ventilation of long tunnels are of a nature that cannot be overlooked in constructing such tunnels, as recent experiences have shown. M. E. Stockalper, in "Les grands Tunnels et la Chaleur souterraine," treats especially of the effects exerted by a continuous high temperature upon the health of the workmen employed in St. Gotthard Tunnel. Injurious effects began to be felt as soon as the temperature of the rock was higher than 29° C. This temperature was reached at 4.5 kilometres from the northern entrance, and 5.5 kilometres from the southern entrance; in the intervening length of 5 kilometres it was higher, and on the average about 31° C.; but the temperature of the air rose in some places as high as 32.5°, and even to 35° C., which, combined with its high degree of moisture, brought on illness in many cases. Three months before the final perforation of the headway 60 per cent. of the workmen on the southern side were ill, 12 per cent. seriously. Of the horses employed, towards the close of the tunnelling operations, ten died on the average per month on each side of the tunnel. Wages had to be raised 25 per cent., and the working hours had to be reduced from seven to five. Professor Du Bois-Reymond states that in perfectly dry air the temperature may rise to 50° C. without stopping work entirely, but that, if the air is saturated with steam, no one can resist permanently a temperature of 40°—Iron.

National Refuge Harbours.

On this subject will take place in the House of Lords immediately after the Easter recess, on the motion of Lord Waverley, chairman of the committees of the National Refuge Harbours Society. A public meeting of the Society will also take place at the Town-hall, Kensington, at the suggestion of the Hon. and Rev. E. Carr Glynn, vicar of the parish. Those who desire to save the lives of our sailors and fishermen are earnestly asked to support these efforts, without a moment's delay, by petitions to the Houses of Lords and Commons, by subscribing to the funds of the Society, or by every other means in their power. Forms of petition will be sent by return of post, with a report of the speeches at the Mausson House, on writing to Mr. F. Johnson, 17, Parliament-street, London. A certain number of convicts are yet engaged as farm labourers and in certain trades, with disadvantage to the State. These might all, it is urged, be better engaged upon national harbours, as one of the resources by which work of this nature might be accomplished, instead of interfering, as sometimes at present, with trade and labour, earning only about one half the amount of money it costs to maintain them, and their wives and families being sometimes supported by their parishes. Convicts alone are not, however, a sufficient resource, nor is convict labour suitable for some places.

Wood and Tile Pavements.—It is well known that wood pavements have been and are gradually taking the place of asphalt in London. This example has been followed to some extent by Paris, where many streets have been recently paved with wood. Some time ago pavements of tiles were experimentally tried in London. This tile pavement has now also been introduced at Berlin, where cubes 20 centimetres (7.8 in.) square and 10 centimetres (3.9 in.) thick, and impregnated with bituminous products up to 20 per cent. of their volume, are employed. The cubes are laid on concrete 15 centimetres (6 in.) thick, and the joints filled up with hot tar. It is affirmed that this description of pavement is superior to wood pavement. Whilst the latter is liable to absorb organic products of decomposition like a sponge, thus forming a hotbed of disease, a tile pavement is completely free from these drawbacks. It permits the water to flow off freely, and lasts much longer than wood pavement, which, moreover, may become extremely dangerous in case of fire.—Iron.

Organ, St. John's Church, Little Holbeck.—Services have lately been held in this church, in connexion with the inauguration of a new organ, which has been built by Messrs. Wordsworth & Maskell, Leeds, and a number of recitals have been also arranged. The external parts of the instrument, which are of wainscot oak, have been constructed from drawings by Mr. W. C. Marshall, of London. The front harmonises with the architectural character of the church, which was erected from one of Sir Gilbert Scott's designs.

The Projected Battersea and Wandsworth Public Hall.

Some twelve months ago the foundation stone was laid, with considerable ceremony, of an intended new public hall for Battersea and New Wandsworth, the site being at the corner of Lavender Hill and St. John's Hill, close to Clapham Junction. The undertaking was promoted by the Battersea and New Wandsworth Public Halls Company, and the building was intended to be a handsome architectural structure, designed by Messrs. Morris & Stallwood, of Reading. (A view of the proposed building was given in the *Builder* for March 17, 1883.) The two frontages on the ground-floor were to contain ten shops, and in the rear of these, also on the ground-floor, there was to have been a suite of rooms for the accommodation of a club,—the apartments to include reading, coffee, smoking, and billiard rooms, a special feature being a winter garden in immediate connexion with the club apartments. The design provided for a public hall, intended for meetings and entertainments, on the first floor, having in connexion with it retiring rooms and several other apartments. The contract for the erection of the building was taken at about 10,000l. by Mr. Smith, of Vauxhall, who proceeded with the work; but, when the basement walls were finished and the ground line was reached, and all in readiness for going on with the superstructure, the works were suddenly brought to a stand owing to the financial difficulties of the company. Legal proceedings followed, resulting in liquidation and the winding-up of the company; and within the last few days the site, with the building so far as it has proceeded, has been secured by a large firm of drapers in Wandsworth, who announce that they are about to erect eight shops, five of which will be occupied by themselves, whilst the remaining three are advertised to let when completed.

Society of Arts.

The following meetings of the Society of Arts have been arranged:—Ordinary meetings (on Wednesday evenings): April 23, "Thames Communications," by J. B. Redman, M.Inst.C.E. April 30, "The New Legislation as to Fresh-water Fisheries," by J. W. Willis-Bund. May 7, "Bicycles and Tricycles," by C. V. Boys. May 14, "Telephones," by Professor Fleeming Jenkin, F.R.S. May 21, "Telegraph Tariffs," by Lieut.-Col. Webber, R.E. May 28, "Primary Batteries for Electric Lighting," by I. Probert. In the Foreign and Colonial Section the following paper will be read on April 29, "The Transvaal Gold Fields; their Past, Present, and Future," by W. Henry Penning. In the Applied Chemistry and Physics Section, the adjourned discussion on Dr. Percy Frankland's paper, "The Upper Thames as a Source of Water Supply," is fixed for Monday, April 21. On May 8, a paper will be read on "Cupro-Ammonium Solution and its Use in Waterproofing Paper and Vegetable Tissues," by C. R. Alder Wright, F.R.S., D.Sc.; and on a subsequent evening a paper, "Economic Applications of Seaweed," by Edward C. Stanford, F.C.S., will be read. In the Indian Section the following papers will be read:—April 25, "The Existing Law of Landlord and Tenant in India," by W. G. Pedder. May 9, "Indigenous Education in India," by Dr. Leitner. May 30, "Street Architecture in India," by C. Purdon Clarke, C.I.E.

The New Railway Works at Blackfriars.—Messrs. Lucas & Aird, the contractors for the London, Chatham, and Dover Company's new station and bridge across the Thames at Blackfriars, are making rapid progress with the undertaking. That portion of the station buildings nearest the river has already been carried to a height of upwards of 20 ft., and the Middlesex shore abutments are also making considerable progress. The excavations down to the bed of the river for the foundations of the piers of the bridge have formed a heavy portion of the engineering work, but this has now been almost entirely completed, and the construction of the piers themselves is now being proceeded with. The mid-river pier is in the most advanced state, having already been carried to a height of several feet above high-water mark. Unlike the piers of the existing bridge, which are of stone and circular in form, those of the new bridge are composed of grey granite and are square in form. About 300 artisans are employed upon the works, which are being carried on continuously, both day and night, by relays of hands.

Improved Construction of High Buildings.—Mr. Frederick Baumann, architect, of this city, has prepared a plan for an improved construction of high buildings, which, in view of the present discussion on the subject, demands consideration. The design is to erect on foundations a firm and rigid skeleton of hull of iron, and cover it at once with a proper roof. The enclosure, whether of stone, terra cotta, or brick, or any combination of those materials, may be erected at the same time the iron structure is being put in place. But the latter might proceed much faster than the former; while the hull might be roofed within two months, the enclosure might not have proceeded further than the fourth story. Thus there need be no delay to a steady progress. Derricks may be set on the roof for finishing the enclosure in a convenient manner. Large, unwieldy, and dangerous derricks may thus be discarded. At the same time that the work on the iron structure is progressing, the partitions, fireplaces, vaults, arching of ceilings, and lining of exterior walls may be put in; thus all interior work would be done and made ready for plastering during the time required for constructing the exterior parts. Mr. Baumann claims that this method would render the work more independent of the weather than by the usual construction; the erection of the iron hull is, in its nature, a rapid process. The practicability of erecting buildings on Chicago soil, twelve and more stories high, then becomes a fact.—*Chicago Sanitary News.*

The American "Elevator."—The ability not only to erect high buildings, but to get, in the States, as much, or even more, rent for the upper floors than the lower, is a direct consequence of the use of the elevator. Thus a New York paper states that "Mr. Cyrus W. Field has completed his new structure, the Washington building, at the Battery, and applicants for rooms are so numerous that almost any price can be asked. There are five elevators in the building, and consequently the upper floors bring more money than the lower ones. An idea of the traffic done in one of these huge buildings may be formed from some statistics which Mr. Field has gathered. On an average 18,000 persons a day pass in and out of the Produce Exchange Building, the Mills building 13,000, the Borell about 10,000, and the Equitable Life about 15,000." The makers of these elevators which are so much appreciated over the water, are now, under the general name of the "American Elevator Company," "elevating" in London and Paris as well as in New York and Chicago.

"White's Hygienic Rock" Composition.—Before the Building Exhibition closed a number of architects, engineers, and contractors were invited by Mr. William White, of 3, Westminster-chambers, to witness some tests at the Agricultural Hall, Islington, for the purpose of illustrating the great amount of strength imparted to walls (in addition to their being rendered waterproof) by the introduction of this now well-known and extensively used material. A correspondent informs us that one brick beam 9 in. thick, four courses high, was encased in the centre by chains to which was attached to a large scale; this was then weighted to the extent of 1 ton 1 cwt. 3 qrs. 8 lb. before the beam fractured. A similar beam 14 in. thick bore 2 tons 1 cwt. 3 qrs. 3 lb. in the centre without the slightest sign of breakage or even deflection, being ultimately broken by a blow from a heavy sledge-hammer while sustaining this weight. Each of the beams was 6 ft. long, with 4½ in. bearing each end.

The Exhibition at Carpenters' Hall.—At the Exhibition of Carpentry and Joinery, at Carpenters' Hall, the Council of the Royal Institute of British Architects have promised to exhibit some of the drawings, &c., illustrative of those subjects in their library. The Royal Architectural Museum will exhibit the well-known drawing of the Flèche of Amiens Cathedral, by the late William Burgess; and Mr. Street will contribute his father's drawings for the roof and flèche of the Law Courts.

A Statue for Weymouth.—For his princely acts of generosity bestowed on the town, and his having been for twenty years their representative in Parliament, the people of Weymouth have determined on erecting a marble statue of Mr. H. Edwards, M.P. for their borough, at a cost of 700 guineas. The sculptors selected to do the work are Messrs. W. & T. Wills, of London. The statue will be placed in the centre of the Alexandra Gardens.

Institution of Mechanical Engineers.

The next ordinary general meeting of this Institution will be held on Thursday, May 1st, and Friday, May 2nd, at 25, Great George-street, Westminster, by the kind permission of the Council of the Institution of Civil Engineers, when the following papers will be read and discussed, as far as time will admit:—

On Thursday, May 1st.—On the Consumption of Fuel in Locomotives, by M. Georges Marié, of Paris; on Portable Railways, by M. Paul Decauville, of Petit-Bourg, Paris; on the Moscrop Engine Recorder, and the Knowles Supplementary Governor, by Mr. Michael Longridge, of Manchester.

On Friday, May 2nd.—Description of the Automatic and Exhaust-Steam Injector, by Mr. A. Slater Savill, of Manchester; Description of the Apparatus used for Testing Current-Meters, at the Admiralty Works at Torquay for experimenting on models of ships, by Mr. Robert Gordon, of Burma; Description of the Francke "Tim" or Vat Process for the Amalgamation of Silver Ores, by Mr. Edgar P. Rathbone, of London.

Visitors' tickets for the meeting can be had on application to Mr. Alfred Bache, the secretary, at 10, Victoria Chambers.

The Butchers' Company's New Hall.—The court of this company have selected the design of Mr. Alexander Peebles, F.R.I.B.A., from amongst those which were submitted to them by invitation for their new hall about to be erected in Bartholomew-close in the City, and have instructed Mr. Peebles to proceed with the necessary works. The design is in the Classic style, freely treated, and the building will contain the hall, court, and committee-rooms, offices for the officers of the company, a ladies' drawing-room, and all other necessary and suitable domestic and other apartments.

Accident Assurance.—The report of the Ocean Railway and General Accident Assurance Company (Limited) shows that the income from new business for 1883 was 13,446l. 3s. 5d., bringing the total income for the year to 32,008l. 13s. 11d. as against 28,298l. 2s. 4d. for the previous year. The usual dividend was declared. The suspense account, or reserve, now amounts to 7,492l. 4s. 3d.

TENDERS.

For alterations and additions to Nos. 74, 75, 76, 77, and 78, Judd-street, Finsbury-road, for the Midland Furnishing Company, Mr. D. H. North, architect:—

Rider & Son	22,138 0 0
Woods	2,100 0 0
Collins	1,877 0 0
Gould & Brand	1,792 0 0
Burnan & Son	1,736 0 0
Languesed & Way	1,697 0 0
Anley	1,670 0 0
Accepted for new headquarters, gymnasium, and drill hall for 3rd Lancashire Rifle Volunteers, Glasgow, Mr. J. H. Wilson, architect, Glasgow. Quantities by Mr. W. J. Hall, Glasgow:—	
J. Peterson, Glasgow (mason and brickwork)	21,473 5 0
W. Wyper (wright work)	839 0 0
Nicol & McVicar, Govan (plaster work)	103 6 10
J. & T. Steward, Glasgow (slater work)	146 10 10
A. Bruce (plumber work)	120 0 0
A. Bruce (gasfitter)	84 0 0
P. & B. Fleming (iron roof)	650 0 0
R. L. Lowe, Tamworth (wood block floor)	360 0 0

For new gasholder tank at Peterborough, Mr. G. E. Stevenson, engineer:—

F. E. Street & Co., 27, Red Lion-square, W.C.	2,346 14 0
B. Cooke & Co., Battersea	1,811 4 2
Dudson & Parrish, Nottingham	1,885 19 8
W. J. Botterill, 110, Cannon-st., E.C.	1,757 0 0
Jas. Bellett & Co., Leicester	1,711 16 6½
Francis Hicks, Peterborough	1,628 14 5½
Chas. J. Corrie, Lichfield	1,503 4 11
Bryan W. Ward, Leicester	1,365 0 0

For additional works at "Kirkdale," Woodberry Down, Finsbury Park, Mr. Wm. Smith, architect:—

D. Lang	2,579 0 0
J. Anley	670 0 0
Matlock Bros.	660 0 0
J. Larke	630 0 0
Clarke	627 0 0
Stevens	485 0 0
W. Sharnum	438 0 0
J. Harper	393 10 0

For alterations at Caroline Villa, Woodberry Down, Finsbury Park, Mr. Wm. Smith, architect:—

D. Lang	2,176 0 0
J. Anley	170 0 0
W. Sharnum	163 0 0
J. Larke	139 0 0
Clarke	137 0 0
Brennan	132 0 0
Matlock Bros.	128 0 0
J. Harper	113 10 0

For the erection of stabling at Lea Valley, Upper Clapton, Mr. J. Hamilton, architect:—

H. Harper	2,425 0 0
S. Hayworth	847 0 0
W. Sharnum	816 0 0
Woolveridge	295 10 0

For the erection of a villa residence, Southwood St., Lawrence, Ramsgate, for Mr. James Frost, Mr. E. L. Elgar, architect, Ramsgate:—

Maria	2,618 0 0
White Bros.	466 0 0
Muller	470 0 0
J. Newby	468 0 0
Lavender	454 0 0
Home	450 0 0
Newby Bros. (accepted)	414 0 0
[All of Ramsgate.]	

For addition of west end and tower of St. Peter's Church, Streatham-hill, S.W. Mr. George H. Fellows, architect, 10, Torrington-square, Quantities by Mr. R. Henry Hale:—

John Walker, Streatham	23,760 0 0
Piers & Co., Westminster	4,676 0 0
William Mason, Streatham	3,883 0 0
Perry & Co., London, E.	3,615 0 0
Dore Bros., Islington	3,355 0 0
Frank Saunders, London, W.	3,376 0 0
T. H. Adamson & Sons, Putney	3,357 0 0
Goodard & Sons, Farnham	3,346 0 0
J. & C. Bowyer, Upper Norwood	3,190 0 0
Cowland & Co., Bayswater	8,044 0 0
* Accepted. † Amended.	

For the erection of a new Grammar School in Upper Lindum-street, Lincoln, from plans and specification prepared by Mr. W. W. Watkins, architect, of St. Edmund's Chambers:—

	Main Building.	North Wing.	Total.
	£. s. d.	£. s. d.	£. s. d.
Martin & Sims	2,340 0 0	612 0 0	2,952 0 0
Cowen & Lansdown	2,298 2 0	630 10 0	2,928 12 0
Walter & Heasman			
Homecastle	2,295 5 0	616 0 0	2,911 5 0
Knight, Martin	2,197 10 0	622 10 0	2,760 0 0
Bennett, Birmingham	2,197 0 0	627 0 0	2,824 0 0
J. B. Harrison	2,167 8 0	633 16 0	2,791 4 0
W. Wright	2,154 0 0	638 0 0	2,740 0 0
Baines, Newark	2,154 0 0	671 10 0	2,725 10 0
H. S. & W. Close	2,115 0 0	589 0 0	2,704 0 0
Crook & Sons	2,105 0 0	555 0 0	2,680 0 0
Greenwood, Mansfield	2,055 0 4	566 4 4	2,621 4 8
* Accepted conditionally.			

For the forming, levelling, and laying foundations, &c., in Chatsworth-street and Back Manchester-road (north), and the sewerage of Sandwich-street and Back Manchester-road (south), Worley (Contract No. 21), and for the sewerage, forming, levelling, and laying foundations, &c., in Alfred and John streets, Worley (Contract No. 22), for the Barton-upon-Irwell Sanitary Authority. Mr. John Price, surveyor:—

	Contract No. 21.	Contract No. 22.
J. Unsworth, Walkden.....	£337 16 11	£375 1 11
G. Unsworth, Moss Side.....	513 1 0	428 5 8
E. Bird, Chorlton.....	497 0 0	413 0 0
J. Randall, Wessale.....	471 19 11	387 5 0
M. Maylor, Hulme.....	467 19 8	362 14 11
R. Loux, Eccles.....	398 3 10	320 14 4
J. Oakes, Keasley.....	383 1 6	328 18 7
W. H. Worthington, Rusholme.....	382 15 4	291 14 8 *
Snap & Sons, Eccles.....	360 13 0	283 4 10
Hannett & Shaw, Ashton-on-Mersey.....	354 4 0	210 10 5
W. & J. Armstrong, Walkden.....	326 6 0 *	...
* Accepted.		

For new hall at Kensington Park, for the St. James's Temperance Mission and Lecture Hall Company, Limited. Mr. Banister Fletcher, architect, quantities by the architect:—

S. Sahey & Son	£4,200 0 0
C. Miller & Son	4,160 0 0
Building, Fitting, and Furnishing Co., Limited	3,650 0 0
W. R. Cubitt	3,493 0 0
W. H. Castle	3,493 0 0
W. H. Loden & Son	3,390 0 0
Stainer & Son	3,265 0 0
R. G. Batley	3,184 0 0
H. Burman & Sons	3,163 0 0
F. Higgs	3,160 0 0
R. Garrard	2,973 0 8
Haggart & Brown	2,971 0 0
D. S. Rice	2,867 0 0
Courtnis & Simmons	2,857 0 0
Leach Bros.	2,841 0 0
H. Buchan	2,868 0 0
W. H. Parker	2,824 0 0
Aldridge & Jenvey	2,643 0 0
Magee & Co.*	1,820 0 0
* Withdrawn; stated to be a clerical error.	

For additions and alterations at the Circus Café, Oxford-street, for Messrs. Ginnell & Co. (as contract), Mr. Banister Fletcher, architect:—

J. Mansbridge	£2,499 0 0
B. E. Nightingale (accepted)	1,962 0 0

For the erection of new premises, Nos. 63 and 65, Basinghall-street, Mr. Richd. M. Rowe, 87, Basinghall-street, architect. Quantities supplied by Messrs. Baistone Bros.:—

J. Grover (accepted)	£4,210 10 0
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For office and show-room fittings, at No. 132, London Wall, E.C. Mr. Richd. M. Rowe, architect:—

Somerville & Smith	£2,762 11 9
Fredrick Sage	688 0 0
Drew & Cadman (accepted)	683 4 0

For the erection of a new wing to the Infirmary, Cale-street, Chelsea, for the Guardians of Chelsea, Messrs. A. & C. Harston, architects, 16, Leadenhall-street, E.C. Quantities supplied:—

Nightingale	£3,037 0 0
W. Johnson	8,517 0 0
W. Downs	8,483 0 0
Magee & Co.	8,490 0 0
Stephens & Baitow	8,286 0 0
Hopwell & Son, London and Bristol	7,851 0 0
* Accepted.	

For erecting and completing four shops, banking premises, and stables, for the London and South-Western Bank, at Church-street, Camberwell. Messrs. J. & J. S. Edmonstone, architects. Quantities supplied.

Mackie	£14,501 0 0
Braid	13,500 0 0
Adamson	13,981 0 0
Kilby & Gayford	12,930 0 0
Kirk & Randall	12,734 0 0
Colls & Sons	12,577 0 0
Wall Bros.	12,473 0 0
Stanford	12,400 0 0
D. D. & A. Brown	12,300 0 0
Boyce	12,370 0 0
Johnstone	12,278 0 0
Hobbs	12,250 0 0
Bowyer	11,969 0 0
Shepherd	11,875 0 0
Kinnoch	11,748 0 0

Accepted for the construction of a culvert and sewers, at Crouch End and Finsbury Park, for the Honorary Local Board Mr. T. de Courcy Meade, engineer and surveyor.

Contract A.—New sewers, &c., in Upper Tollington Park, and Lancaster-road.—

E. & W. Iles, Wimbledon.....£1,400 0 0

Contract B.—New sewers, &c., in Oakfield-road.—

E. & W. Iles, Wimbledon.....£475 0 0

Contract C.—New sewers, &c., in Stapleton Hall-road, Victoria-road, and Albert-road.—

Cook & Co., Battersea.....£253 0 0

Contract D.—New sewers, &c., in Ferns Park-road South.—

F. A. Jackson & Son, Finsbury Park.....£273 0 0

Contract E.—New sewers, &c., from Claremont-road to Colthurst-road, Crouch End.—

F. A. Jackson & Son, Finsbury Park.....£520 0 0

Contract F.—New storm-water culvert and pipe sewers on the Crouch Hall Estate.—

Cook & Co., Battersea.....£2,627 0 0

For a new front to upholsterer's shop in Goldsmith-street, Nottingham. Mr. Fredk. Jackson, architect, Nottingham.—

W. Collison.....£177 0 0

J. Cooper.....153 10 0

H. Marriott.....134 15 0

Huskinson & Jefferys (accepted).....127 0 0

J. Cargill.....115 0 0

For the conversion of dwelling-house into shops, situate in Goldsmith-street, Nottingham. Mr. Frederick Jackson, architect, Nottingham.—

W. Collison.....£870 0 0

J. Cargill.....763 0 0

H. Marriott.....734 0 0

J. Cooper.....710 0 0

Huskinson & Jefferys (accepted).....617 0 0

For erecting and completing farm buildings at Broxbourne Farm, Broxbourne, for Mr. W. L. Bosanquet, Messrs. E. Vigers & Co., surveyors. Quantities not supplied.—

Colls & Sons.....£370 0 0

D. D. & A. Brown.....580 0 0

Hunt.....567 0 0

Neslan.....790 0 0

For boundary-wall at the Lambeth Workhouse. Mr. T. W. Aldwinckle, architect.—

Hammond.....£312 10 0

Riches.....297 10 0

Cook.....293 0 0

Whittingham.....280 0 0

Ansell.....280 0 0

Tyerman.....273 0 0

J. & H. Mills.....265 0 0

Tye.....249 0 0

Huggatt & Brown.....235 0 0

Accepted for additions to Lilyburne House, Milton of Camphire, near Glasgow, for Mr. A. McNab, Mr. John B. Wilson, architect, Glasgow. Quantities by Mr. W. J. Hall, Glasgow.—

Fletcher Bros., Kirkintilloch (masons).....£233 8 8

A. Ferguson, Glasgow (wright).....576 0 0

Caldwell & Sons, Kirkintilloch (slaters).....36 19 3

A. Bruce, Glasgow (plumber).....100 0 0

J. Bryden & Sons, Glasgow (gas and bells).....23 19 1

For the erection of new Congregational Church at Haverhill, Suffolk, and conversion of the old one into school. Mr. Charles Ball, architect.—

Mason & Son, Haverhill (accepted).....£4,532 0 0

[No other tenders.]

For proposed schools at Denmark-street, Barking-road, for the West Ham School-Board. Mr. J. T. Newman, architect, 2, Fen-court. Quantities by Messrs. Curtis & Sons.—

	Superstructure.	Foundations.
Burman & Son	£10,400	£717
Heale & Son	10,147	827
A. Reed	9,940	819
G. J. Hoskings	9,595	689
J. Moller	9,430	654
W. Grogan	9,237	620
J. W. Hobbs	9,139	630
M. Gentry	9,003	730
Magee & Co.	8,838	684
J. Holloway	8,550	490
Priestley & Gurney	8,608	636
G. J. Horlock (accepted)	8,429	698

[Cost per head for 1,272 children, 71. 1s. 10d.]

For proposed infirmary, Chatham, for the Medway Union. Mr. E. W. Stephens, architect, Maidstone.—

Trueman & Co., Luton	£8,635 0 0
Slade, Maidstone	8,559 0 0
Skinner, Chatham	7,803 0 0
Dennis & Son, Deal	7,700 0 0
Wilks, Maidstone	7,512 0 0
Ball & Sons, Southampton	7,423 0 0
Harris, St. Andrews, N.B.	7,350 0 0
Vaughan, Maidstone	7,350 0 0
Wells & Clements, Maidstone	7,344 0 0
Avart, Maidstone	7,283 0 0
Pankhurst & Son, Chatham	7,180 0 0
Naylor & Son (accepted), Rochester	6,993 0 0

For alterations and additions to No. 2, Wilton-road, Pimlico, for Mr. Eli Turner. Quantities by Mr. Edward Gruebler, Albert Chambers, Victoria-street, Westminster.—

T. Gregory	£298 0 0
Martin, Wells, & Co.	280 0 0
W. King & Son	265 0 0
Reading	249 0 0
Falkner	236 0 0
J. M. Mace & Sons (accepted)	220 0 0

[Surveyor's estimate, 35 1/2]

For erecting new town-hall and public offices, Kirkwall, Mr. T. S. Pesce, Junction-road, Kirkwall, architect. Quantities by Mr. Andrew Lawrie, ordained surveyor, George-street, Edinburgh.—

W. Pirie, Kirkwall.....£24,425 13 8

S. Baillie & Sons, Kirkwall (accepted).....3,993 0 0

[All other tenders received for portions only.]

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

E. E. M. (we cannot uphold that it is a "failure of justice" without having seen the subject-matter.—J. B. (we cannot uphold the matter with a full view of it. Why not write to the seller of the property whose name you give?)

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

N.B.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications beyond mere news items which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS.—NOTICES OR ORDERS TO DISCONTINUE ADVERTISING, must reach the Office before TEN o'clock on WEDNESDAY morning.

PERSONS Advertising in "The Builder," may have Replies addressed to the Editor, 46, Catherine-street, Strand, W.C. free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied FREE from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum, PAYABLE TO THE EDITOR within the First Month of the year. Remittances payable to DOUGLAS FOURDRINER, Publisher, 46, Catherine-street, W.C.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

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mermouth, London, W. [Adv.]

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Agent, Mr. H. M. MORTIMER, 6, Augustus-road, Ham-

mermouth, London, W. [Adv.]

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SAFETY "FALL DOWN" GATE STOPS, and IMPROVED GATE FITTINGS of every Description

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LONDON, LIVERPOOL, GLASGOW.
VIEILLE MONTAGNE BRAND.
NO SOLDER.
NO EXTERNAL FASTENINGS.
PARTICULARS ON APPLICATION. CHIEF OFFICE: 360, EUSTON ROAD, LONDON.

The Builder.

VOL. XLVI. No. 2181.

SATURDAY, APRIL 20, 1884.

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The Principle and the Practice of Water Rating.



SHOULD the inquiries of the Select Committee on Water Supply, for which Mr. W. H. Smith gave notice of moving on the 1st of April, be rigidly restricted to the terms of the motion in question, another opportunity of throwing light on the important question of the London water-supply is likely to be as

completely missed as not a few others have already been. Let us for a moment ask, What is the real object of inquiry? Inquiry, from our point of view, will be little more than waste of time unless the object with which it is made is to secure to the inhabitants of London the best possible supply of good water at cost price, or as near thereto as is, under the actual circumstances of the case, practically feasible. Were the question one of founding a new city, the physical and chemical features of the case would be the only points necessary to ascertain. But, in the case of an ancient city that has grown up, as it were, of itself, the original physical conditions are, to a great extent, modified by the growth, and thus by the present condition, of roads and of buildings. And in addition to this complication comes in the financial problem of the best mode of dealing, with a due regard to public faith, with the rights of the existing companies.

The first thing, therefore, to be done, with any regard to common sense, is to ascertain all the facts of the case, taking none of them for granted. It is precisely in this matter of taking something for granted that all the recent plans for the water improvement of London have come to grief. First of all, it was taken for granted that by borrowing money at 3 or 3½ per cent., while the companies were paying a dividend of 7 or 8 per cent., the price of water and of gas might be reduced one-half. Then a company, got together on that assumption, took it for granted that the now existing water stock could be purchased for 26,000,000. Then the Metropolitan Board of Works took it for granted that London would bear the burden of a double supply, involving paying interest on a double capital. Then the valuers of the Government took it for granted that unless some 38,000,000. were paid, or agreed to be paid, at once, for the purchase of the existing undertakings, for every year that elapsed a great addition must be made to that

large price. Thought, care, ability, no doubt, were brought to bear on these several schemes. But the mere citation of them shows how each, varied as they were in conception, was in its turn vitiated by the same error,—that is to say, by taking for granted something which was not proved, and which, as it turned out, was not true.

This error is again apparent in the terms of the motion above referred to. We are prepared to admit the justice of any denunciation of excessive and inequitable powers of rating. But it must be first shown that they exist, and it is essential to any good result that the committee of inquiry should not at starting impair its own authority and nullify its own work by assuming that as to which it is called into existence to inquire. And a second objection, also of considerable force, lies in the consideration that the basis of rating, which is the subject around which the present contention is going on, is only a part of the main and real problem of the price paid, and to be paid, by the metropolis for water. The question of the basis of charge is at once essentially distinct from, and intimately connected with, the question of the amount of charge, and so it has been regarded, not only in the case of the metropolitan companies, but in those numerous Acts of Parliament (which, at the close of 1880, were as many as 767), under which so many urban and rural districts throughout the country now obtain their water supply. That there is a great want of symmetry in the language of these Acts is undeniable. But it is no less true that the *ex post facto* introduction of a new rule, giving a common measure as to the basis of rating, might produce mischief and injustice of another kind. Thus, one Act of Parliament, based palpably on gross value, may fix a four per cent. rate, while another, based with equal distinctness on net value, has fixed one of five per cent. The thing to study is the amount of money which it is intended to raise. As a general rule the interest on the capital required for the construction of waterworks has been provided, not by putting a price on the goods sold by the companies,—that is to say, on the water delivered, per metric ton, or per 1,000 gallons,—but as a percentage on the rent of the house. Whether this be the best plan or not is, perhaps, not now in question; it is the plan hitherto adopted in this country. It would be intelligible that in the case of a district in which the necessary works for a due water supply were large and costly a higher rate should be imposed than in one where the outlay was comparatively small. This, however, is not so much the point which now exercises the public mind, as the fact that the mode in which the basis of charge is laid down differs

very widely in different cases. One Act of Parliament has the term "rent," another "annual value," a third "rateable value," a fourth "rack rental," a fifth "full annual value," a sixth "gross rent," a seventh "gross annual value," an eighth "net rateable value," a ninth "poor-rate assessment." Not only are these terms other than identical, but they actually have very different values, differing more or less widely in different places. Thus there may be a difference of twenty or thirty per cent. between two modes of reckoning the annual value of the same house, and it is impossible to tell what the annual payment for water will be while such a question as this is left open.

Two separate methods of inquiry lie before any tribunal that proposes to investigate the subject of the water rating of the metropolis. The first is to inquire into the actual money outcome of the rates, and the proportion that this bears to the capital and expenditure of the companies, due regard being had to the conditions sanctioned by Parliament under which such capital was obtained from the public. Second and subsidiary to this, but still possessing a determinate value of its own, is the inquiry, how far the water supply of London is better or worse, dearer or cheaper, than that of other important cities and towns in different parts of the country.

This second inquiry, which ought to a very great extent to be conclusive, is attended with such unnecessary and extraordinary trouble, that it is not likely that any satisfactory answer can be returned to it until some public-spirited member of Parliament moves for a return of the accounts of the waterworks of the whole country, made out on the same principle as that which regulates the returns of the metropolitan water companies. A vast amount of information exists in the library, and, notably, in the seventy-four volumes of Proceedings, of the Institution of Civil Engineers, as to waterworks. But when it is attempted to ascertain from these sources what is the price at which a definite number of gallons of water are supplied in any given locality, the silence of all these works is so persistent that it is difficult to imagine that it is not purposed. The elaborate report on the domestic water supply of Great Britain, which was issued by the River Pollution Commissioners in 1874, and which gives information, of some sort, as to 610 out of the assumed number of 16,000 cities, towns, villages, and hamlets, is almost exclusively concerned with the chemical condition of the water, although it would have added little, if anything, to the expense of the inquiry to have collected at the same time information as to cost. Mr. De Rance's work, entitled, "The Water Supply of

England and Wales," has collected from Parliamentary reports statistics as to the mode of supply of a large number of places, but hardly anywhere adds the cost. Mr. Parry's little book, called "Water: its Composition, Collection, and Distribution," which gives some valuable information as to rating, omits to give that information as to the actual money outcome of the nominal rates which is measured by price per 1,000 gallons. "Water, and Water Supply," by Professor Ansted, is equally silent as to cost. The outcome of a careful investigation of all these sources of information, although yielding some results of value, to which we hope hereafter to allude, is so far from being exhaustive, that we are strongly inclined to think that no investigation of a Parliamentary character will have much definite value until a general return of the condition and cost of water supply throughout the kingdom is called for by Parliament.

The cost at which water is sold in large quantities by water companies, or by corporations or other public authorities, may throw some light on the price of supply as a comparative question. At the same time, it is necessary to have full information as to the source of water supply in each case, in order to understand how such a price is fixed. As a general rule, water is sold in large quantities, measured by meter, at a lower price than the average charge per 1,000 gallons. This is right and fair, as distributory cost is, to a great degree, saved in these cases. In London, the selling price for trade purposes varies from a maximum of either 9d. or 7½d. per 1,000 gallons to a minimum of 6d.; the price to domestic consumers, as arrived at by comparison of the quantity delivered and the revenue received, being 7-8d. per 1,000 gallons. In thirty towns cited by Mr. Parry, the selling price varies from a maximum of 2s. (at Manchester, and also at Bury) to a minimum of 4d. at Glasgow, with the solitary exception of Plymouth, where water is sold at the extraordinarily low price of 2d. per 1,000 gallons. This is less than the actual cost of pumping and maintenance of works over the whole of the London waterworks, exclusive of any charge for management and collection of revenue, or of any interest on capital. It is thus very interesting to inquire how it is that the Corporation of Plymouth, which charges on a house of 10l. rent outside the limits of the borough half as much again as is charged on such a house by four out of the eight London water companies, can afford to provide large quantities of water at this low rate. The reason,—apart from the question of proportionate charge,—is this. The waters of the river Mew, which rises in the lofty mountain district of Dartmoor, are diverted at 3½ miles from its source, and allowed to flow directly into four high-level service reservoirs, from which they are delivered by gravitation, without incurring any expense for pumping, filtration, or any other manipulation. This method of supply, which physical geography limits to a very few important towns, represents the minimum cost at which water can anywhere be obtained, and contrasts very forcibly with the numerous sources of expense that occur in the case of London, and in a large majority of the water-supply districts of England.

At the other extremity of the scale the town of Blackburn, at a level of 400 ft. above the sea, collects a constant supply of about 2,000,000 gallons daily from springs and surface drainage, which it sells, for non-domestic use, at a maximum price of 2s., and at a minimum price of 6d., per 1,000 gallons, in proportion to quantity. But the inhabitants of Blackburn have to pay eight per cent. on the rateable value of their houses for domestic supply. The supply is constant, and the consumption is at the rate of 25 gallons per head for all purposes. The London water supply, as to cost, compares very favourably with that of Blackburn, as will presently appear.

The actual cost of the London water supply is so much lower than is generally held to be the case, that it is proper to indicate with unusual precision the authorities relied on for the cardinal facts.

The rateable value of London, within the

area of the districts of the eight great London water companies, is stated by Sir J. W. Bazalgette, Engineer to the Metropolitan Board of Works, in his address, as President, to the Institution of Civil Engineers on the 8th of January, 1884, at 28,000,000l. The total amount received in the year 1883 by the same companies for water rates and sales was 1,561,811l.; out of which upwards of 300,000l. was received for sale of water supplied for trade purposes by meter, at prices ranging from 9d. to 6d. per 1,000 gallons. The balance, say 1,260,000l., is equal to exactly 4½ per cent. on the rateable value of the property.

The rates which the different companies are entitled to charge vary with an amount of detail into which it would exceed the limits of our space to enter; but, briefly abstracted, and allowing only such extra charges as may be taken to be absolutely indispensable, over an average of the nominal rentals of 10l., 50l., and 150l. per annum, the companies are entitled to make a charge of 5-53 per cent. We use the words "nominal rental," because it is on the determination of the basis of charge that the contention now in progress hinges. Thus in the parish of St. George, Hanover-square, the rates are about 22 per cent. under the gross value according to the valuation lists, and the average in the other parishes served by the Chelsea Company is 15 per cent. below the annual value. But in the figures above given it is not the full, but the net, or, rather, the rateable, value (which is usually below that which would be determined to be net value), that has been taken as basis of charge. From this it would appear that the companies have the legal power to receive 1,540,000l. per annum for their present domestic supply. As before shown, — and we refer to the authority, viz., the "Analysis of the Accounts of the London Water Companies," by Alfred Lass, F.C.A., p. 11,—they only receive 1,200,000l. for that supply. Instead, therefore, of its being possible by legal means, if open war were once declared between the companies and their customers, to reduce the present rates by one-fifth, allowing the utmost reduction that can be claimed as to the basis of rating, the companies are at this moment in the receipt of 280,000l. per annum less than they can legally claim.

We are aware that this statement will take many persons by surprise. Certainly it can surprise no one more than it has done ourselves. But the one object that we have in view is truth. These are the figures, and these the authorities. The case is one as to which there can be no mistake, and it is of primary interest to the water consumers of the metropolis that they should have the real facts placed before them.

"ANTIQUITIES FROM ARMENIA."

THERE are now to be seen in the Assyrian galleries of the British Museum a small but interesting series of bronze antiquities, obtained by Mr. Rassam from the neighbourhood of Vau. In 1878 Sir Henry Layard, while ambassador at Constantinople, obtained several fragments of bronze ornaments, which had been found near the town of Vau, in North-east Turkey; but although he made every inquiry, he was unable to ascertain the place from which these antiquities came. On the appointment of Capt. Clayton as H. B. M. Consul at that town the inquiries were renewed, and also by Mr. Rassam. At last the site from which the natives had obtained this first instalment was discovered to be the mound of Toprak Kalla, about fifteen miles from the town of Vau. Excavations being commenced here, there were revealed the remains of a very interesting edifice, evidently a temple of the chief Vanian deity, Khaldia. The building was remarkable in construction, in that it differed in situation, style, and construction from all that might have been expected in this region. Although there were several eminences overlooking the lake, the temple was built on an artificially-constructed mound, approached by a made causeway. Along the sides of this sacred way were

placed at regular intervals a series of plain stone monoliths, uninscribed or ornamented. The walls of the building were built of sandstone, but faced inside with most carefully-cut blocks of black basalt, formed with the greatest accuracy. The reason for this mode of construction is to be found in that slavish copying of Assyrian art and architecture which characterise the Vanian people. Late in the tenth century before the Christian era they had borrowed the cuneiform writing from the Assyrians, having been brought into contact with the armies of Assyria by the wars of Assurnazirpal and his successors, and in all matters of art they were most studious copyists of the mode of Assyria. The temple was, no doubt, built on this artificial mound and elevated causeway, in imitation of those on the lowland plains of Assyria, and faced with hard stone, as the walls of sundried bricks in Nineveh were with gypsum and limestone. The Vanian temple, however, differed in several points from the Assyrian. Its entrance was by a plastered front or columned portico, and the roof was not a flat or domed one, but a gabled one (see Botta, pl. 141). The space between the cornice and gable is filled in with a kind of trellis-work. During the excavation at Toprak Kalla there were found a number of small black and white tesserae or tiles, which appear to have been used to decorate the walls, and which, no doubt, were the component parts in the decoration represented in the above-mentioned sculpture from Khorsabad. During the researches on this spot there were discovered a number of bronze fragments of considerable interest, as showing the modifications which Assyrian styles were undergoing at the hands of Vanian artisans, who made them their canon. The first of these is the figure of a couchant winged bull. The example is manifestly copied from the Ninevite forms, but the excellent proportions there observed have been violated, and the result is a figure which approaches very closely to the conventional style of the bulls at Persepolis. It has been long enunciated by Professor Fergusson that the Assyrian winged bulls were used in architectural work as supports for columns, and his theory has met with confirmation by the discovery by Mr. George Smith ("Assyrian Discoveries," pl. iv.) of a small model of a winged bull bearing on its back the base of a column. There is also from a palace at Nimroud a small couchant sphinx, probably of the time of Esarhaddon, which has served a similar purpose. The example from Vau, however, is a stronger proof still, as not only the base but a considerable portion of the column remains. This column exhibits a disregard of the law of proportion such as we might expect in the work of a people who had no distinctive art of their own, and is covered with ornamentation, consisting of a pattern resembling the *svastika* inserted in a square. It is important to note that we find this same ornamentation on the Hittite sculptures at Carchemish. Together with this important fragment were found several portions of large bronze bowls, the handles of which were formed by the heads of cows, exhibiting a manifest copying from Assyrian examples found by the explorers at Nimroud. Some fine plates, of nearly pure copper, moulded to represent a fortress, appear to have formed part of an altar, and together with these is a finely-worked angle-joint, decorated with the honeysuckle and guilloché patterns. Most important, however, are the fine bronze shields, as by means of them we are able to establish the date of these works. There were found in the explorations several portions of bronze shields, three being in fair preservation. These shields have as a decoration concentric bands of lions in motion, divided by a wavy water-line band, the boss being apparently a lion's head. The shields bear on them inscriptions of a king named Russas, the son of Argistis. This monarch was the contemporary of Assurbanipal, king of Assyria, and in B.C. 645 paid tribute and made homage to him. It is, therefore, interesting to find at this date the elements of that bizarre style which became dominant at Persepolis already developing in Armenia.

WREN'S CITY CHURCHES.*

A very wise and experienced friend once gave us this advice: "Whatever temptations a book may offer to the reviewer, never forget to treat it and its author with respect." It is presumably the best he has to give, and he is no doubt unconscious of the blemishes which are obvious to others."

We have striven, and shall strive, to observe our friend's prudent caution; and treat the author with all the respect to which he is entitled. A writer careless of such restraint might liken the work before us to the delirium of a student whose health had failed while cramming for an examination in Ruskinism. We shall take it as a serious effort to help a cause with which we heartily sympathise.

The book is substantially a reprint of a lecture delivered in behalf of the preservation of the City churches when their wholesale destruction was imminent, and the author is an enthusiastic if not a discreet advocate. With him the doomed churches are the highest efforts of architectural skill, and their architect unique in his art. We will heartily admit his remarkable ability, and have always felt grateful for the "crown of towers" with which he has adorned our capital city. But in order to give him his due meed of praise there is no necessity to disparage Mediæval art, to deny its greatest works any "unity of design," or to affirm that its builders worked only by "rule of thumb"; and the claim that Wren's towers and spires are not "piled column on column as the *Goth* shot up his spire, or, again, as the Chaldees build Babel tower: but all is controlled by just principles of proportion, and determined by appropriateness of position," is in a double sense grotesquely inaccurate. "Can any mediæval tower or spire," the author asks with sublime effrontery, "compare with this [St. Stephen's, Walbrook] for richness of form, for nobility of structure, and sensitiveness of proportion? Can any other example be found which in so small a space has so much interest, so much thought?" Such extravagant praise and blame only discredit the judgment of the advocate who employs it. Wren was first of all a mathematician, and had thus one of the best of qualifications for his task. He was, moreover, imaginative and versatile, and his versatility found a scope in the greatest opportunity that ever fell to the lot of an artist. It was only by accident that he became an architect, and to the last his bias was towards the experimental sciences. It must, moreover, be remembered that the destroyed churches were varied in form, and it is probable that, having been impressed by the lightness and grace of the Mediæval towers and spires, he sought to reproduce their effect by means of Classical features,—the only ones with which he was familiar, and he succeeded. His spires are Gothic in *motif*, though Classic in detail, and, while their general form and proportion are almost always pleasing, their details are often inconsequent and unmeaning. Wren was a keen man of business. Two days after the Great Fire, Evelyn called upon the king with a plan for rebuilding the City, to find, to his astonishment, that Dr. Wren had forestalled him. He appears to have set about his work much like his weaker brethren of to-day, and it is amusing to find him in Paris, whither he had fled from the plague, buying all the engravings of grotesques and ornament he could come upon to introduce in his English works—the French, he said, excelling in this branch.

The circumstances of Wren's career are pretty well known, and the author adds nothing to our knowledge but the (doubtful) statement that the religious and political conflict of his time fell upon him with "peculiar intensity," and that "contending brain-tempests wore his swaddling clothes." As a matter of fact, he steered his course amidst religious and political shoals and rocks very adroitly and securely. He lived under five Sovereigns and a Commonwealth. Through

the Revolution and the Rebellion and religious changes without end, and while the more prominent men in every walk of life were sent to the dungeon or the block for opinion's sake, he contrived, in a double sense, to keep his head.

The book is in some respects a singular one. In the first place, the author employs in writing up Renaissance art an imitation of the manner which Mr. Ruskin so effectively employed in writing it down. It is assumed that in some way the writer is a disciple of Mr. Ruskin (it will be observed that the book is issued by the sacred publisher of Orpington); but it is the master's manner only which is followed, and not his spirit. Whatever Mr. Ruskin's religious creed may be, no one doubts the strength of his sense of personal religion. He is an uncompromising Theist, and a firm believer in the Divine order and government of the universe; while his imitator sedulously avoids any reference or allusion to the spirit which inspired the erection of the structures whose cause, as works of art only, he pleads, and he would be quite content (p. 102) to see them converted to secular uses. We are all familiar with Milton's "star-pointing pyramid," and with the common and beautiful suggestion that the church spire was intended by its Mediæval builders as an index to the life beyond the grave, leading men's ideas and aspirations heavenward. The following extract will show how far, in the same direction, the author takes us. Of the (admittedly) beautiful Bow steeple he says, "How quiet the transition between these contrasting portions, where sleeping lines seem one by one to wake and lift themselves up till they climb over each other in eager desire to lead the eye upward to,—to what?—to the great dragon high poised in mid air above!"

The opening sentence of the book may be taken as a fair sample of the author's style:—"Alone in the art of a people long since passed away, do we get given us the entirety of its nerve life,—its expression, by own tongue and hand, of pulse-beats and throes of heart's elating joys and saddening sorrows, its grief, gloom, and gleam of glory."

At every turn we meet with such phrases as "reading lightly lithic language," "many mingling melodies of form," "pale pillars of pearly light," and such like. It must, we suppose, he assumed that there are readers who can endure and even enjoy this word-jangling. But why, we would respectfully ask, if the writer really feels it to be a misfortune "that the weaknesses of great men should be caught up and caricatured until the world is deluged with frothy literature under the shadow of Ruskin's name, babbling waters of cant, streams muddy with the dregs of democratic reform" (!)—why, we repeat, still respectfully, does the writer aid in the dissemination of this diluted and polluted Ruskinism? Mr. Ruskin's greatness (which we take to be somewhat over-estimated) is not due to his manner alone. That, of its kind, is, however, almost faultless. He would never have passed in a proof such an expression as a "rectilinear line," and the perverse and persistent imitation of Mr. Ruskin's worst tricks of style is doubly irritating in a writer who can, and does occasionally in a sort of happy forgetfulness, deliver his tidings like a man of this world.

One question more. Why, if the writer really sees such ineffable beauty in Wren's work, does he so cruelly misrepresent it in his only engraving?

Here is a description of a view from Fleet-street, looking towards St. Paul's:—

"But we must now pass on to St. Martin's. The grace and delicacy of this steeple form, as its spire in trembling notes ascends the sky are of such a quality that words can hardly awaken that fine sense of form by which alone such a pure lyric in architecture can be appreciated. In this, as in all art born of a poet's mind, one is ever forced to fall back on this intuitive perception, which, when wanting, can never be artificially gained.

However, I would refer you to one or two points. At first glance, who that can at all appreciate its beauty, is not enraptured with the melody of its many mingling notes of form, its dancing buoyancy and splendid balance? Or who can help but be fascinated by the delicate cascade with which the

different curves glide each into each, enchanting the eye; as upward 'tis led from long stretch of vertical lines below to the finely-finished needle crest above? Hardly a movement is there of its quiet surface, which, abutted by houses on either side, not until it has lifted itself clear of these busy buildings does it give us the first note of its melody of form.

And how soft, how grand, are these first notes, so like the opening chords of a Beethoven symphony!—how quiet the transition from square of tower to the octagon of spire! How bold that soft sweep of scroll which unites the aisle coping with the tower flank! So, this balcony, which fringes the spire, as some petals the pistil of their flower [we know, by the way, how meanly Wren thought of fringes and edgings], how well it echoes back the columned balcony that fringes the dome of its mother church," &c.

In walking up Ludgate-hill we see, 'as maiden 'tween two warriors strong,' pale Martin's tower standing 'mid Paul's stout porch pinnacles,' its sable spire brought clean against the cathedral dome . . . which vies in buoyant grandeur with the domed and pillared clouds above."

We will not criticise in detail this wonderful passage. Byron describes, we think, Medora's plaintive love lay as "trembling into silence," and the thought is pretty and appropriate; but a trembling and dancing spire! However, our point is, that in the engraving which is supposed to illustrate the scene described, all its beauties are turned into deformities, and all its deformities are exaggerated. The drawing is not only faulty; it is the very worst drawing of the cathedral we have ever seen. Every good point in the structure is overlooked or falsified. It is toppling over. The cupola is not poised upon the centre of the dome. The dome is not of the contour of the original. The base is not a circle. The lines of its colonnade are crippled, the intercolumniations follow no rule; the solid counterforts which give such a steady look to the whole are omitted; the crowning cornice is a clumsy cordon. The "stout porch pinnacles" are not a pair, nor on the same plane; and the nearer one is the smaller of the two. "Pale Martin's Tower" has not a line which is even approximately right, and we are at a loss to conceive how any draughtsman could acknowledge the authorship of such a drawing. We say nothing of the toy train, the ghostly figures in the street, and the general want of perspective. The plate is characteristically underwritten, "Soul Strivings from Struggle into Calm," and a sickly sentimentality pervades the whole, as unwholesome of its kind as is the literary style of the author. Biographers and apologists have in recent years played strange pranks, and their literary treatment of departed friends has gone far towards adding a new terror to death.

It is hard upon unassuming merit that it should, after the sleep of centuries, be dragged from the tomb only to posture involuntarily in a character which would have been repugnant to the original when alive. And these posthumous panegyrics of over-zealous but indiscriminating admirers will, if unchecked, tend, it is feared, to extinguish all contemporary ambition, the penalties following success being so severe.

NOTES.

The occurrence of what we may take to be the most severe shock of earthquake which we have positive record on this island demonstrates to us unpleasantly the mobile character of the crust of the globe on which we live; a fact which in these latitudes is usually not forced upon our ordinary and unaided senses, though constantly evident where special and delicate means of observation are employed. The immediate effects of the shock have been serious, and in some localities disastrous, and to be added to the immediate injury done to life and property is the anxiety which such a visitation naturally leaves behind it as to its possible recurrence, and the sense of insecurity arising from this feeling. There seems to have been something very unusual in the condition of the earth lately, of which it may be presumed that the great Krakatoa eruption and earthquake, the extraordinary sunsets of the year, and this present unusual visitation on our own shores, are all various manifestations not unconnected with each other. The most unpleasant consideration for us is that where

* "Wren's City Churches." By A. H. Mackmurdo, A.R.I.B.A. Published by G. Allen, Sunnyside, Orpington, Kent.

earthquakes have occurred they are likely to occur again; at least, there is considerable evidence towards that conclusion; though we can hardly think that the phenomenon of this week is any prelude to our becoming an earthquake country, at least to anything like the extent to which tropical localities suffer. At all events, the occurrence ought to give a new impetus to our observations in seismology, to the end that we may, at least, have some chance of forming conclusions as to the probability of a recurrence of the calamity, and draw from a close observation of the minor movements of the earth's crust some warning as to the condition in which it is, and the chances of more serious movements supervening, so as to be on our guard against the results. That is, unfortunately, all that we can do. For any preventive measures, an earthquake leaves us absolutely helpless. We have our lightning conductors to manage the thunderstorm, but we have no earthquake conductors; we know neither its conduct nor (except in a conjectural manner) its cause; and no one can go down to see. Perhaps the most practical immediate comment which we, from our point of view, can make in regard to this event, is to invite any persons with practical knowledge of buildings, who may have been at any of the spots of greatest disturbance, to send us reliable information as to the special effects of the shock upon buildings of various construction, so that if there seems any tendency to a recurrence of earthquakes here, we may have the commencement, at least, of some data as to the best means of construction for minimising their effects on buildings.

THE committee appointed by the Prince of Wales to consider the decoration of "Wellington Place" have reported in favour of the Government scheme of removing the present statue to Aldershot. In recommending that Mr. Boehm be entrusted with the execution of a new equestrian statue, we observe that the committee adhere to the statement that the late Duke never sat for the existing statue, in spite of the positive evidence to the contrary which has been published, and assert that in consequence Mr. Boehm will have just the same advantages as the original sculptor. The other decisions are that the Place shall be laid out as designed by Mr. Fergusson (which, we hope, will include obliterating the present feeble "surveyor's" plan, and starting on a new basis), and that the arch should be completed according to Decimus Burton's design, with an enrichment of bas-reliefs and sculpture and a quadriga, as shown in the original model and drawing lent by the Royal Institute of Architects. This is the most satisfactory portion of the report, as at length doing justice to the favourite work of a very able architect; though we cannot but regret that this decision was not come to before the close of Burton's long life, that he might at least have had the satisfaction of seeing the completion of his design, the treatment of which during his life time caused him the greatest vexation. The "quadriga" is to be thrown open to a limited competition; we suppose as a kind of "sop" to the sculptors for the refusal of open competition for the statue, which every one had certainly been led to expect. In the course of the discussion of the vote in "Supply" on Monday last, one speaker expressed the feeling of many people outside the House in saying that Mr. Boehm did not occupy such a position among the sculptors of this country as to justify the expectation that in excluding every one else and putting the commission into his hands they were doing the best for the work. In the further discussion of the subject the House was as amusing as it generally is on matters of "taste." Sir Robert Peel added his name to the list of those who profess inability to understand why the existing statue was in any way objectionable in its former position.

AMONG the more valuable documents which Mr. Maxwell Lyte has found in the muniment-chests at St. Paul's Cathedral are the contracts for building houses, tenements, &c., upon the Chapter property in town and country, and for repairing churches in caputular patronage.

Of these contracts a large number belong to the fourteenth and fifteenth centuries. The language employed in them is usually Latin or French, and occasionally a mixture of both. It is scarcely necessary to say that the Latin is not strictly classical, nor the French that of modern Paris. Technical terms are sometimes given in the vernacular. Thus, in an agreement made in 1347 (21 Edward III.) with Richard Cotere, carpenter, for the construction of a wharf upon the Thames side, it is stipulated that the posts, 12 ft. high, shall be firmly joined, one to another, "que quidem constructio vocatur Anglice *Neddyng*." Again, in a contract for roofing the chancel of Halstead Church in 1418, the particular form to be adopted is to be that known as a "clare-roof." It was to contain thirty "copule," measuring 8 in. in breadth, like the roof of the chancel in Romford Church, the intervening spaces to be filled with "Englyssh bordes," as in Romford Church above the high altar. In other agreements mention is made of "Estrieche bord," "Flandrysch tyles," "plastrum de Paris" (1335), "planchis bord de coer de keyne bone et rieste" (heart of oak), &c. An interesting agreement, dated 1348, provides for the rebuilding of the chancel of Sandon Church (Herts) upon the old foundations. The walls were to be 17 ft. high; the east wall to have a window with three divisions, called "dayes," and each side wall two windows, similar to the said chief window, but containing only two dayes apiece. At each of the two chief angles there was to be a buttress, 5 ft. in breadth and 1 ft. 6 in. in thickness, and a buttress of like size in each of the side walls. There was to be a suitable door on the south side. For this work Thomas Rykeling, stonemason, was to have the stone of the chancel and 20 marks. Taking the mark at its ordinary value of 13s. 4d., the whole work would have been executed for less than 14l.

An important painting by Mr. Tadema is to be seen at Mr. Lefevre's Art Gallery, 1A, King-street. The picture, which is entitled "The Parting Kiss," is a scene in the vestibule of a Roman house, where a mother is parting with her child, who is going off with a friend, who waits in a chariot half seen through the doorway. The view through the open door shows us also the paved road and the shops, and the amphitheatre closing the view, with the masts from which the velarium will be swung standing up against the blue sky. Apparently it is gala-day, for another carriage is seen driving off in the direction of the building. The picture is marked by all the artist's usual power in representing Roman architecture, accessories, and costume. The "restoration" of the chariot forms an interesting point in it. The same gallery contains an admirable portrait of Mr. Tadema, by Mr. John Collier, under the title of "The Artist in his Studio."

SIR WILLIAM HARGREAVES' Bill seems to have "raised the waters," to adopt Launcelet Gobbo's phrase, and various correspondence is going on against it, and meetings have met and resolutions been resolved for the most part condemning it *in toto*, and some one has been at the trouble to compile all the journalistic expressions adverse to it and publish it under the title of "Public Opinions on the Government of London Bill." With some people public opinion means that which agrees with their own opinion. As far as the adverse expressions within the area affected are concerned, they seem to be mostly the bitter cry of Vestrydom in its various phases. An ex-Mayor of Boston, however, who may be disinterested in his expressions, states that New York had various municipalities with independent action within its area, and that the intention had once been to consolidate them, but that the first steps towards this proved so "confusing, corrupting, and unpopular" that the idea was abandoned, and New York remains with local district government. It has yet to be learned, however, how much of this confusing and corrupting influence in the endeavour to introduce the change was due to influences from which we may flatter ourselves that our Parliamentary

Government, with all its defects, is free. There is a good deal to the point to be said on both sides; no doubt; and a great deal more will be said which is not to the point; but we anticipate that in its main provisions the Bill will become law.

THE aesthetic sense of the Londoner seems to be gradually awakening. We have got rid at last of the Duke off the top of the arch, and now we read of a meeting of the Vestry of St. Ann's, Blackfriars, at which a resolution was passed, not only condemning the construction of the viaduct of the London, Chatham, and Dover Railway over Queen Victoria-street (constant complaints having been made of "the rain percolating through the structure, and dripping in the shape of dirty water upon persons passing underneath"), but also protesting against its ugliness, and recording the opinion that "the bridge should be rendered less unsightly, and more in accordance with the improved architecture of the surrounding buildings." We cannot feel very much enthusiasm about "the architecture" of the surrounding buildings (the *Times* office, for instance), nor are we quite sure that Queen Victoria-street has superseded Ludgate-hill as the "leading thoroughfare" of the neighbourhood; still, that railway companies should be required to make their structures less ugly, and that the suggestion should emanate from a vestry meeting, are signs of the times. Perhaps we may hope to see a suggestion made presently to improve the Ludgate-hill bridge also.

THE special meeting of the Institute of Architects last Monday evening to consider proposed changes in certain by-laws did not result in much. The most important point to be discussed, the alteration which was practically to bar any one from becoming a Fellow of the Institute without passing an examination (unless in cases to be specially excepted by the Council), was understood to be put out of court at present by the interposition of the legal advisers of the Institute, who were not satisfied of the legality of the proposition in reference to the terms of the charter. Then Professor Kerr, who was to move the other propositions, partially abandoned his colours by intimating that he did not wish to "press" his resolutions, but only, apparently, to gently instil the ideas embodied in them into the minds of members, and leave them to bear fruit. One of these propositions was for the appointment of an honorary secretary for foreign correspondence, independently of the present honorary secretary. Professor Kerr, in fact, was stirred by the remembrance of the days when Professor Donaldson, in the capacity of "foreign secretary," exercised so much personal influence among Continental architects, and was the channel for bringing before the Institute so many communications of special interest. We should be quite in favour of the appointment suggested if another Professor Donaldson could be found, and we imagine that was the general feeling of the meeting; but as such a successor is not at present forthcoming, the *status quo* was voted by a large majority.

WE learn that the Council have decided to arrange in the Parkes Museum a collection of models and illustrations of objects relating to cremation and improved forms of burial and disposal of the dead, as a supplement to the International Health Exhibition, this subject not being included in the classification of that Exhibition. The Council will be very glad to receive offers of models or other information, as they wish to make the collection fully representative of the latest and most approved plans and methods.

THE exhibition of 100 pictures by "100 artists" at the Fine Art Society's Gallery in Bond-street has not produced a very remarkable or happy result, nor can we see any especial motive for that form of exhibition except the desire to produce a popular alternative title. Some of the artists represented are unknown to fame, and had better have

remained so; others of higher reputation seem to have sent their poorest works. Among the exceptions is a really fine nude study of the head and bust of a woman by Mr. J. Collier (46), under a poetic title which is quite at variance with the realism of the painting. Mr. Colin Hunter's "Low Tide" (16) is a good specimen of his style; and there are some good works among the water-colours, some of which have been already seen elsewhere.

M. CLERMONT-GANNEAU has given, in a letter to the *Times*, an amusing account of one of the last developments of archaeological forgeries at Jerusalem. This is in the manufacture of terra-cotta lamps, "little antique lamps, belonging for the most part to the Christian epoch, and found by hundreds in Jerusalem and its neighbourhood." These *Lycenaria* (the name derived from an inscription on one of them) bear curious Christian symbols, and often Greek inscriptions. The lamps, which were moulded separately in upper and lower pieces, and put together, are easy of imitation, and numbers of counterfeits have been made; but the forgers are not content with Greek inscriptions: they have learned to fly at higher game now, and their lamps must have Hebrew inscriptions! When people go in seriously for deception, it is possible to be too clever by half.

THERE is to be a competition, open to all French architects, for a new Palais de Beaux-Arts at Lille, which is to be erected in the public square, facing the Prefecture, and to concentrate all the existing art collections of Lille in one building. It will include a museum of paintings, ceramics, pottery, and various other antique art, decorative art, and eventually a museum of sculpture, though this does not appear to be part of the immediate scheme. The celebrated Wicar collection will also be housed in the new building.

THOSE who are practically interested in the question of the prevention of fires in theatres should look at the papers on the subject by Mr. Arthur Shean and Mr. Woodrow, in the *Journal of the Society of Arts*, published on the 18th of this month. The former gentleman details a good deal of his experience and observation in regard to the existing arrangements at London theatres, and Mr. Woodrow deals with the theory of the subject, and the points in regard to planning and construction to be avoided or insisted on for rendering our theatres more safe from conflagrations and their attendant consequences. The distinction between the ideal conditions and the actual facts in regard to most of our theatres is striking enough; yet the recommendations made are only such as ought to be followed in all cases, or as nearly as possible.

MR. REDMAN's paper at the Society of Arts on Wednesday evening, on the subject of "Thames Communication" was an able and lucid summing up of the problem, with a statement of the special difficulties attending each scheme. Mr. Redman thinks that a new bridge between London Bridge and Southwark Bridge would be the best means of relieving the traffic of the former; a proposition which is, of course, incidental and wide of the real point to be dealt with. On the main question he sums up very much as we have done already, believing that further communication below London Bridge is much required; that of all permanent and fixed methods of passage a tunnel will be attended with the fewest drawbacks, unless exceptional difficulties in the nature of the ground are met with; and that before any permanent and costly scheme is entered upon, the experiment of ample ferry-boats, crossing at short intervals, should be fairly tried.

Employers' Liability Assurance Corporation (Limited).—The directors of this company are now issuing their third annual report, and have resolved to recommend a dividend of 2s. 3d. upon each of the 2l. shares of the corporation, carrying forward a reserve of 20,906l.

CO-OPERATIVE BUILDING AND THE FRENCH COMMISSION.

THE *Official Journal* has commenced the publication of the evidence given to the Parliamentary Commission; but our readers are already acquainted with some of the main points relating to the building trades. For the minute details, it will be necessary to refer to the *Official Journal*, and doubtless many months will elapse before the entire report is completed. Among the various speakers whose declarations lack of space prevented our noticing at the time they gave their evidence, the Director of Public Works at Paris, M. Alphand, most certainly occupy the first rank. M. Alphand, it is true, only spoke in his own name, and not as the representative of the public authority, but this will scarcely reduce the influence his words are likely to exercise. We have seen how the employers, representing a great variety of trades, all complained of the tariff established by the town, arguing that it had an unfair influence on the scale of wages. M. Alphand promptly met this complaint. After remarking that what might be called the Paris Board of Works, over which he had the honour to preside, had been in existence fourteen years, he went on to explain that the welfare of the working-classes had always been considered by the town as a matter of paramount interest. Not only did he proclaim it as a principle that the strong were in honour bound to protect the weak; but, where the Government was based on universal suffrage, it was dangerous to neglect the interests of the masses. The rate of wages the town should pay to the workmen in its employ was always looked upon as a question of the highest importance. The administration had established a scale of wages for its own guidance, but it soon became the custom to take this scale as the basis for all estimates. Private firms, architects, experts, and even some tribunals have all adopted the tariff of wages paid by the town. It must not be thought, however, that this weighty question was settled merely according to the ideas of M. Alphand and his subordinates. On the contrary, delegates, both from the workmen and the employers, were convoked and consulted. On both sides, it was agreed that an augmentation in wages was necessary. The authorities at first objected; they pointed out that such a rise in wages would check the building enterprises then so much in vogue. Also, it would tend to raise house-rents, and the workmen themselves would then be the first to suffer. Nevertheless, the latter insisted that they ought to earn 8s. per day; and it was in spite of the resistance of the administration that the wages of artisans connected with the building trades were augmented on the whole to the extent of about 40 per cent.

This intervention of the State in the matter of wages does not seem to meet with M. Alphand's approval. The pressure is purely moral; there is no law to enforce the adoption, by private enterprise, of the rate of wages paid to those engaged in public service; still this has so far influenced the Paris labour market, that, in many instances, it is now impossible to compete with foreign trade. M. Alphand, therefore, considers that the establishment of an official scale of wages is an error which must be renounced at no distant future. Nevertheless, M. Alphand recognised that the labour question was in a critical condition, for the most absolute mistrust prevails between workmen and their employers. For many years, the advocates of every conceivable political party have promised that the condition of the working classes should be improved; but these promises have never been fulfilled. Not only is a deplorable feeling of antagonism now prevalent between master and man, but the general conditions of work have been altogether modified. Instead of an individual employer, we now find that financial societies or banks are at the head of the principal building enterprises. But the workman has no confidence in these grand societies. The friendly relations between master and man had ceased to exist, for such companies were obliged to employ intermediaries. The workman was no longer personally acquainted with his employer. Mutual confidence and friendship were alike abolished, and the interests of both parties became more and more antagonistic. The workman soon ceases, under these circumstances, to take any interest or pride in his work; the money it can bring in is the only question in which he is

concerned, and he struggles for an increase of wages without any regard for the prosperity of his employer or his trade.

To remedy this grievance, M. Alphand recommends (as we have often recommended) the association of the workman in the benefits of his employer. Nor is this all, M. Alphand would encourage co-operative productive societies where the entire profit goes to the workmen. To facilitate such a movement, M. Alphand has warmly supported the project of constructing, in Paris, a large labor exchange. In this Bourse du Travail the trade unions and co-operative societies of Paris would have separate offices, all demands and offers of labour would be centralised, and all information on such matters readily obtained. This project has been discussed frequently by the Paris Municipal Council, and is viewed with more favour now than some three years ago, when it was first mooted. M. Alphand then went on to explain what had been done by the Prefecture of the Seine, under the administration of M. Charles Floquet, to facilitate the participation of working men's associations in adjudications of works done by the town of Paris. In three years, fifty-seven workmen's societies had obtained contracts for works which they had satisfactorily executed. The total value of these contracts amounted to 54,600l., and the town was now about to spend 60,000l. in furniture and fittings for public buildings, schools, &c., which it proposed to purchase direct from working men or their co-operative societies.

Dealing with the question of the housing of the poor, M. Alphand declared that there were 480,000 lodgings or apartments in Paris that did not exceed a rent of 12l. per annum. It was not, he maintained, the want of tenements that constituted the grievance, but the absence of anything like sanitary regulations. The greater part of the houses occupied by workmen were absolutely unworthy of a civilised nation. In this matter the lower middle classes were as interested as the workmen. These defects were, he maintained, due to ignorance and not to the necessity of economy. It was quite possible to build houses for working men that would possess all the necessary sanitary qualifications and yet yield a good interest on the capital invested. To relieve the present distress, M. Alphand suggested that the proposed metropolitan railway should be at once built, and this would represent an outlay of 3,200,000l.; that the Sorbonne and the Collège de France should be in part rebuilt, and several new schools constructed. With respect to the general aspect of the crisis, M. Alphand agreed with the evidence given by M. Christophe on behalf of the Crédit Foncier, and which has already been summarised in these columns.

Whatever doubts might exist as to the prevalence of exceptional distress were removed by M. Quentin, the director of the administration for the relief of the poor (Bureaux de Bienfaisance). During the last three months the applications for relief had increased to the extent of twenty-five per cent., as compared with the corresponding period of last year. This is the more unfavourable, as the accounts for last year showed an augmentation of distress on those of the previous year. The tendency to abandon aged relatives and infant children was a sure sign of exceptional poverty. In 1882 there were 2,743 newly-born infants abandoned, but in 1883 the number rose to 3,151. These evidences of distress were specially noticeable among the workmen engaged in the building trade and the manufacture of furniture. This assertion was confirmed by M. Camescasse, the Prefect of Police. Thus, speaking of the masons, the Prefect mentioned a firm which employed fifteen men in January, 1883, and only three men in January, 1884. Several other cases showed an equal falling off in the number of men at work. The joiners, the floor-makers, and the house-decorators all suffered keenly, but the stone-cutters and the locksmiths were not so unfortunate. With regard to the moral situation of the workmen, M. Camescasse bore testimony to a great reduction in the consumption of wine and alimentary substances. The number of bankruptcies has considerably increased; the public balls and places of amusement are not so well frequented; and yet crime is not more prevalent than usual, a fact that speaks well for the Parisian population.

With respect to co-operation, M. Barberet was called upon to give evidence. M. Barberet,

it should be explained, was once a popular leader of the working-classes; and he was the author of a labour chronicle which appeared every day in Victor Hugo's paper, the *Equipe*. Ultimately, however, he was suspected of having pledged himself to support the Government, and was consequently denounced as a renegade. In fact, he accepted the position as chief of the Bureau for the Registration of Syndical or Professional Chambers and Friendly Societies—an office attached to the Ministry of the Interior. It was in this capacity that he was called upon to give evidence before the Commission of the Forty-four. In his statements, he agreed with M. Alphonse that the members of the building trades were the principal sufferers, and that by association the workmen could effectively improve their condition. Where trade unions had been organised production was more fruitful, and co-operation gave rise to still greater improvements. If the workmen participated in the profits trade would be greatly increased. A year ago, there were thirty-five productive co-operative societies in Paris, now there are no fewer than sixty-two such societies with more than 2,000 members. The development of the co-operative movement would put an end to the strikes, which, M. Barbet considers, have been specially disastrous to French commerce. He, therefore, urged that facilities for obtaining credit should be extended to co-operative societies. There were in Paris about 200 workmen's trade unions and about 200 trade unions formed by the employers. In the provinces the masters had only 200 unions as opposed to some 600 unions organised by the men. M. Barbet then sought to prove that his office was in no wise connected with the police, and only depended on the Home Office. But to the average Frenchman's mind the Home Office and the administration of the police are so intimately connected that it is impossible to draw the line between the two. Hence the registration of trade unions and benefit societies is looked upon as little better than a police measure taken to hold working-class organisations in check. This explains the signal failure and political weakness of l'Union des Chambres Syndicales Ouvrières, with which M. Barbet was, at least, indirectly connected. The fact that this attempted federation of workmen's trade unions was promoted by persons in receipt of Government pay caused the collapse of the movement.

M. Desmoulins, a municipal councillor, speaking in the name of the Tax-payers' League, also insisted that the building trades had been most severely affected, and urged that to resist foreign competitors it was necessary to encourage and revive the system of apprenticeship, a subject which has also been seriously considered among our own capitalists and master builders. A municipal commission under the Empire had decided to give special rewards to those who had contracts of apprenticeship; but in 1871, when an inquiry was held on this subject, it was discovered that the number of apprentices with contracts was only equal to 21 per cent. An institution of apprenticeship was then organised at La Villette, and the pupils retained for three years received gifts from the Government. The result was that these young men were able to earn 8s. 6d. to 4s. per day. A professional school for cabinet-makers was now about to be opened in the Rue de Reuilly, and, by the establishment of similar institutions throughout France, M. Desmoulins maintained that the danger of foreign competition would soon be dispelled.

As for the workmen themselves, their views were clearly shown by the members of the National Committee of the Socialist Federation of French Workmen, and have already been explained in these columns.* Dr. Paul Brousse, M. Joffrin, the working-man member of the Paris Municipal Council, Allemane, Babin, and others, have given able evidence in the name of the Possibilist Collectivists; while M. Jules Guesde and Paul Lafargue were heard as the representatives of the Revolutionary and "Agglutinated Possibilists," as they are called. On all sides the unfortunate middleman was unanimously condemned. The mildest reformers were in favour of simple, self-organised, productive co-operation; but the majority of the working men have already lost faith in co-operation, and embracing, to some extent at least, the teaching of Dr. Karl Marx, advocate the nationalisation of the implements of labour. Their notions of co-operation assume

the form of State-organised production, according to the Collectivist schools of modern scientific Socialism. The introduction before a Parliamentary Commission of such new teaching is in itself an event of perplexing importance; but the organisers of the inquiry have, at least, displayed some wisdom in giving the example of free discussion. The difficulties of the present economic position will not be solved by Boycotting all the suggestions of the working-class representatives; and if Socialism is fallacious, this must be demonstrated by patient argument,—if necessary, by practical experiments,—and not, as was too often the practice under previous Governments, by angry threats and the display of armed force.

THE INTRODUCTION OF PAVING.

In the days of Whittington and his much-venerated cat it was the belief of all true Englishmen who had never journeyed to London that its streets were all paved with real gold, laid down by the bankers, who were supposed to be the great contractors for paving. Such glorious dreams were, however, soon dispelled whenever one of these dreamers came up to London in quest of a few golden pebbles, especially if he entered the metropolis on a wet day; for he would have found it difficult to find even a flagstone of the rudest description. In those days, the early part of the fifteenth century, the attention bestowed upon roads and streets was very fitful and uncertain. The probabilities are that the first attempts at paving, in the ancient cities, were effected by the wealthier inhabitants, who paved those parts of the street immediately before their own houses; it was, therefore, optional and uncertain.

The Romans, in the time of Augustus, had pavement in many of their streets; and the Apian way was a paved road, constructed as early as 312 B.C. The most commercial cities were the first to adopt the practice of paving public streets. It was from Carthage that the Romans acquired their first idea of its importance, and the City of Rome became paved by degrees. Josephus relates how the Jews proposed to Agrippa, after the building of the Temple was finished, to employ the workmen who had been discharged from building the Temple, to pave the streets of Jerusalem. It is an interesting fact that the remains of Herculaneum show that the streets of that city were paved with lava, some of them having a raised path on each side for foot passengers.

Coming nearer home, it does not appear that London was paved in the eleventh century, if an opinion is to be formed from the details of an accident which is said to have occurred in 1090, in the principal part of the City. Bow Church, in Cheapside, was unroofed by a storm of wind, and four beams, which formed part of the roof, were precipitated to the ground, and penetrated the soft miry soil of the street to such a depth that only 4 ft. of their length was visible above ground, although the entire length of the beams was 26 ft. In 1417 a royal command was issued, which states that "the highway called Old Bourne was so deep and miry that many perils and hazards were thereby occasioned to the King's carriages passing that way, and to those of his subjects"; he, therefore, ordered two vessels of 20 tons each to be employed at his expense in bringing stones to pave the streets. It may be taken that in England there were few paved streets before Henry VII.'s reign, and that London was paved somewhere about the year 1533, but flagstones were not generally adopted until between 1815 and 1825. Smithfield appears to have been first paved about 1614. Wood and asphalt paving were first tried in 1839, when a wooden pavement was laid down in Whitehall, and several other leading thoroughfares, after which this kind of paving seems to have fallen into comparative disuse.

Sauval, in his History of Paris, relates a circumstance which occurred in that city, which is at once characteristic of the dirty state of the streets, and of the power of the clergy at that period. King Philip was passing St. Gervais on horseback, on the 2nd October, 1181, when a sow ran against his horse's legs, made him stumble, and threw the King, who died the next morning from his injuries. This resulted in an order being issued that no swine should be allowed in future to run about the streets; but

this was opposed by the Abbot of St. Anthony on the ground that it was contrary to the respect due to their patron saint to prevent his swine from enjoying their liberty. This opposition resulted in an exclusive privilege being granted to the clergy to allow their pigs, provided they had bells attached to their necks, to revel in the dirt of the streets. The introduction of pavements, however, was only delayed some three years, and was brought about by the following circumstance, as related by Regord, physician to Philip the Second. The king was one day so annoyed by the sight and odour of the dust and rubbish in the streets, that he gave orders to have them paved with stone at his own expense. This occurred in 1184, and cost 11,000 marks of silver. The great improvement thus effected stimulated the authorities of other cities to follow the example. In 1391 Dijon was paved, the Duke of Burgundy contributing 2,000 livres towards the undertaking. By the year 1424 the whole of the streets were paved, with the result that the health of the inhabitants was greatly improved. Then came the difficulty as to how the streets were to be kept clean. After Paris was paved each inhabitant was ordered to keep clean the pavement opposite his own house, but to such an extent was this order evaded that the streets became choked up with rubbish. A law was passed to make the order more peremptory, and, later still, the enforcement of the law was made more rigorous by heavy penalties. This induced the inhabitants to join together in small parties for the hire of men and carts to remove the ever-accumulating rubbish. But still the order was not obeyed by the nobles, who considered themselves exempt from such a duty, the consequences being that many of the squares became dust depôts. Another law made it incumbent on all to perform this duty of getting rid of their own rubbish, but eventually the Government had to make the cleansing of the streets a national undertaking, the first contract price being 70,000 livres per annum.

One of the most curious modes of causing the streets to be cleansed was that adopted at Berlin in 1671, when it was ordered that every countryman who brought goods into the city for sale at the public markets should take away a load of rubbish on his back. In many of the Continental cities the duty of cleansing the streets was shifted on to the shoulders of persons who were regarded as being of low condition. Sometimes the skinner had this tax imposed upon them, at other times the servants of the public executioner had to bear the burden, and, in many instances, this office was added to the number of indignities which were so freely heaped on the Jews in those days.

The Government of Spain, during the Middle Ages, showed some practical interest in public improvements, the city of Cordova being paved so early as the year 850, by the fourth Spanish caliph. The origin of paving in the city of Augsburg, in Germany, may be regarded as typical of what took place in other towns and cities. One Hans Gwerlich, a rich merchant, caused a neat footpath to be laid before his house in 1415; this was so much admired that the Government shortly afterwards paved the whole city.

The various kinds of paving in use at the present time are too familiar to every one to render any notice of them necessary. One of the most prominent signs of advancing civilisation or enterprise in a nation, or in any city or town, is the attention given to its public roads. Some vague idea of the attention given to this subject in this country may be gathered from the fact that when the last census was taken in 1881 there were 4,150 pavements in England and Wales. In the London division alone, apart from the intra-metropolitan counties of Middlesex, Surrey, and Kent, there were 852 pavements, and 607 road-labourers.

The Manchester Society of Architects have made the following awards:—The Society Prize, offered for the best essay on the Manchester Cathedral, has been awarded to Mr. Thomas Locke Worthington. The essay comprises an historical and architectural description of the cathedral from its foundation, with numerous illustrations. Mr. James P. Holden's prize for the best set of measured drawings of Renaissance tombs in the old churches in and about Manchester has been awarded to Mr. Frank L. Heslop.

* See *Builder*, p. 168, ante.

BRITISH MUSEUM LECTURES.

On Wednesday last Professor Hodgkiss gave the first of a new series of six lectures in the Anglo-Saxon Room at the British Museum, to be continued on successive Wednesday afternoons. The subjects of the lectures we have already announced (p. 389, ante). We extract some passages from the first lecture, on the subject of "The Earthen Jar." Professor Hodgkiss observed that when we regard the remains of any results of ceramic art, whether the rude productions of nomadic tribes, or the refined efforts of highly civilised nations, we find certain points of similarity which lead some antiquaries to the hypothesis that the utensils of ruder nations are but copies of higher forms of art existing among peoples of greater culture, and consequently greater completeness in their artificial productions. The theory that all the world became more or less Roman in a frantic desire to imitate the imperial self-styled mistress of the world has been shown in my former lectures to be untenable as regards the arms and military arts of the Northern "barbarians" who humbled her to the dust. I have shown that she, in her boasted conquest, took much from surrounding nations; that the days of the week and the number of the months were copied by the Romans from barbarians, and not vice versa. Now, because from the very nature of the object, any vessel made on a potter's wheel, — from the Ganges to the Amazon, — partakes of common peculiarities, it would be rather hazardous to say that a form produced in South America by some aboriginal artist was a copy from a Hindu design, merely because it was similar. If anybody will take the trouble to turn a potter's wheel, — or get it turned for him, — will he moulds a vase with his untaught hands, he will be surprised to find how classical the first attempt he makes becomes. This only shows that the potter's wheel all over the world produces the same effects and similar forms, but by no means justifies us in saying that the forms we see must be Roman, because Roman potters produced similar pots to those made by barbarians.

The forms before us prove no obligation to classic models; they only show that the vessels were formed by Aryans, who had the potter's wheel in common with all members of that race. They are precisely similar to those found in Scandinavia, the pattern observable on some of them being identical with those found on other Northern remains.

In a former lecture I alluded to the structure of the mead-hall, with its high bank and other surroundings, but struck no special key-note for the smaller buildings or rooms which surrounded the chief apartments. At present the sight of the earthen jar before us, reminding us of the various uses to which such a vessel could be applied, and of the places in which it could be kept, brings us to the consideration of the wine-jar, the water-jug, and the funeral urn, with the respective places in the house or out of it which are devoted to their reception.

In the first place, we are informed that there was a regular place or cellar set apart for wine contained in such jars as some of these, and that this place was called the *wîn-arn*, or "wine-place." This was either a cellar dug below the floor of the house (or, at least, under the ground near it), or else a kind of artificial cave made of large stones piled one on another, so as to form an out-building to the hall itself. In such a *wîn-arn* was stored a number of wine cesters, or things to contain wine (from the same root whence the word *chester*, an enclosed place, is derived, — having no more connexion with the Latin *castra* than *hate* has with *hat*). In *Ælfric's* Vocabulary we find the word *cantarus* (*canthores*) so translated. Besides these wine cesters, we meet, in the *wîn-arn*, with *wîn-bely* (wine sack or skin, or leathern bottle); *wîn-cle*, i.e., wine-cooler; *wîn-fet*, i.e., wine vessel or tub, all of which had their places in the *wîn-arn*. Besides the *wîn-ester* (pronounced *chester*), we have the *wîn-sester*, which was a measure of fifteen pints, and the two words are very distinctly referred to by *Ælfric*, who translates *Amphora* by *sester*, and *Enophorum* by *wîn-fet*.

Not only were there so many various vessels for containing wine, but we find as many, if not more, for those intended for the reception of water, — *wæter-buc*, bucket; *wæter-bydan*, a barrel; *wæter-croc* or *crog* (German, *wasser krug*), a pitcher; *wæter-fat*, a vessel for water

(a flagon); the two latter being earthenware vessels similar to those before us.

When we look attentively into the form of an Anglo-Saxon jar and contrast it with a Roman urn, we see at a glance that it is the production of another race. There is a sturdiness, a thick-set character about an English jug that looks like business. The curves are not so elegant, nor is the whole effect so pleasing to the eye, but it is highly interesting as exhibiting the same kind of curve as is to be found in the centre of many of the older forms of columns supporting Saxon arches.

The circular form of arch is in agreement with the mysterious veneration for the circular form evinced by our forefathers in the construction of their Thing-temples; and, in fact, of every object capable of being well presented in a circular form. Their shields were circular, and many other objects have been spoken of as partaking of this wonder-working form. The zigzag pattern on the arches having no parallel in Italian art, is called specially "Saxon," and the Saxons called it "*fræt*" work. This *fræt* is from the verb *frætan*, to gnaw, devour, eat, and refers either to the saw or tooth-like appearance of the ornament, or to the cutting-out of the original wooden arches into tooth-like ornament. It became applied to any kind of ornament that was elaborately worked, and the English goldsmiths of the time of Alfred were remarkable for the beauty of their execution of such ornaments in gold and silver.

Under these circumstances, we ought to feel rather proud of this dumpy jug, which, like nearly all the Anglo-Saxon remains in this "Mithum house" of ours, shows us that our ancestors were men of thought and men of action clearing the way for us.

The word "*pot*" has been derived by some from *pytt*, a deep place with water in it. I have been led to suppose that it is a corruption from "*bottle*" or "*botel*," originally a dwelling-house, but used in later times for the dwelling-place of the spirit which wrought so much ill among our forefathers when released. Certainly our "*bottle*" comes from "*botel*," as does "*pottle*," and it would seem an easy matter to get "*pot*" out of it. On the other hand, there is an Icelandic word *Pottur*, which means a vessel, whether of earthenware or metal, for water or wine, and this would, of course, account for it. But this word does not occur in Bosworth, nor have I met with it in Anglo-Saxon writings; we must have got it through the Normans, indirectly from Icelandic, — unless it be, as I have suggested, a very corrupt contraction of "*bottle*," or a form of *pytt*.

The word occurs in a vocabulary of the fifteenth century, which is no proof that it was not used before. It only seems to point to its being of Norman introduction. I believe that the vulgar expression "*gone to pot*" is a corruption of *gone to pytt*, i.e., to the grave. In the edition of "*Piers Plowman*," by Professor Skeat, he gives us at the end of the "*Crowley*," or B text of the poem, a short "glossary," in which the *crank* of the original is followed by "*pot*." This is the time of Henry VIII.

Although the word *potter* is evidently a recent addition to the vocabulary, the *cylen* or kiln, as a place for drying, occurs, and the workman whom we should call potter, is designated *croc-wirhta*, crockery-wright or crock-worker; while the brick-maker or tile-maker is called *tigel-wirhta*, translated by Bosworth by "a tile or pot worker, potter." The word is from *tigian* or *tigan*, to draw, and the substantive *tigel* stands in the same relation to the verb as the German *Ziegel* (a tile) stands to the word *ziehen* (to draw). In fact, the substantive does not indicate merely a tile, but anything that can be made by the potter and drawn out of clay. In Bosworth's Dictionary a remark is made that "*porringes* are to this day called *tigs* by the working potters." The adjective form is *tigelen*, quasi *tien*. The tiles used for a roof are called *thectigel*, i.e., thatch tile; thatch being cognate with the German *Dach*, a roof, or *Decke* a cover. The final *c* in English becomes *ch* in many words, and generally after a soft vowel (i, e, o, or *æ*), as *wicco*, in modern English becomes "*witch*."

And the men who made these bottles, or jars, or jugs, or urns, also formed the bright tiles of the Saxon roof. When motives of economy did not demand that the materials of the roof should be of humble straw or shingles, then the *tiglere*, or tiler, came boldly forward, and the ridges of the arches were his work, the delicate corrugations of the cupolas were made by him,

and, more recently, the bricks of which the various ornamental portions about the windows were constructed, came from his hand. The stone *timberer* (which sounds rather as from a neighbouring island than sober Saxon diction) raised the pile; the *tiglere* formed the roof and many ornaments. Then the earthen vessels in which precious wine was stored were also his manufacture.

In the old Pagan times the tiler formed this very urn, his hand shaped the peculiar ornaments that identify the vessel as the outcome of English skill, and in this cinerary urn the ashes of the warrior were placed. It was, so to speak, the coffin of the brave Pagan to whom we owe so much. The vase that held his wine, the cooler that contained the water which the bright partner of his joys and woes preferred to the more fiery beverage that burned through his veins; the vat that held the beer and mead, to which his followers looked with delight as sufficient reward for dangers which few of their degenerate offspring would care to face, even upon much better terms. All these, and many more highly interesting considerations, flash upon us when we behold the dumpy earthen jar.

LONDON AND MIDDLESEX
ARCHÆOLOGICAL SOCIETY.

A MEETING of this society was held at No. 4, St. Martin's-place, Trafalgar-square, on Monday evening last. Mr. E. J. Barron occupied the chair, and directed the attention of the meeting to some objects of interest on the table, including a very large bronze arm of a statue, heroic size, recently discovered during the railway works in Seething-lane, City.

Mr. John E. Price, F.S.A., the secretary, read a paper on a recently-discovered monumental brass of Sir John Popham, knight, 1463. The brass was discovered during some repairs in the Church of St. Lawrence, Reading, and, when found, was let into a large stone called a ledger. On the upper side was an effigy and an inscription, "Here, under this marble stone, lieth Walter Burton, gent., 1538," &c., and, on being taken up, the brass was found to be a palimpsest, or rescript, i.e. part of a brass that had been previously used for another person. This other person proved to be Sir John Popham, who, according to Stowe, had been buried in the cloister of the Charterhouse, London, where there was a monument to his memory. When the Charterhouse was dissolved the brass must have been purchased by an engraver and used a second time for Walter Burton. Stowe writes, Sir John Popham was a "great builder at St. Sepulchre's, viz., of a faire chapel on the south side of the quire." Besides this accidental association of the name of Popham with St. Lawrence's, Reading, there is another entry in the old accounts which points to a closer connexion, viz., "Anno 1491. Item payd for mending of Popham's vestment."

The "vestment," or chasuble, seems to indicate some mass or *requiem* performed here for some member of the family, and, as it required mending in 1498, it was, presumably, of considerable age at that time; indeed, it may have been given by this very Sir John, or his executors, for his commemoration. There is a picture of Sir John Popham on horseback in the Vestry, presented by the Rev. Sir W. H. Cope, bart., of Bramshill; a copy of an illumination on a MS. in the British Museum. The brass shows part of the feet of Sir John, part of a lion under the feet, hand of sword, and arms of Popham. The full inscription is:—*"Hic jacet Johannes Popham Miles quondam Dominus de Turney in Normandia et dominus de Chardeford de Dene ac de Aldington et alibi in Anglia qui obiit xliiij die mensis Aprilis Anno Dni Millimo CCCCLxiii 1463 Cujus anime propicietur Deus."*

Mr. Thomas Milbourn, Hon. Secretary of the Surrey Archaeological Society, next read a most amusing and humorous paper on "London Clubs." The oldest London club, he said, he could find any record of was entitled "La Court de la Bone Compagnie," or the Court of Good Company, temp. Henry IV., and of which Chaucer, the poet, was a member. He rapidly glanced at the history of London clubs from that period down to that of Broke's Club, Almack's, White's, Beefsteak Club, and others, giving many anecdotes of Sheridan, Fox, and others. The Chairman, in proposing a vote of thanks to Mr. Price and Mr. Milbourn for their papers, made a few observations in reference to

the Lumber Club, whose efforts were recently sold by auction by Messrs. Furber & Price.

Mr. J. E. Price, in replying to the vote of thanks, alluded to a fragment of Roman pavement recently discovered in Cloak-lane. Mr. T. Milbourn also replied, and the meeting adjourned to the second Monday in May. The *conversations* took place on Thursday evening last, April 24, at Drapers' Hall.

PROPOSED MONUMENT TO GARIBALDI AT TURIN.

THE erection of this monument was decided on in 1882 by the Municipality of Turin, who voted 100,000 lire towards the expenses.

The public subscription produced 8,000 lire more; and the competition was opened in July, 1883, requiring designs (executed to a scale of one-fifth real size) to be sent in by the 2nd of December. Besides the premium for the design selected, a second prize of 3,000 lire was offered. There were twelve competitors, and the sketches were exhibited the whole of last December.

The Commission gave the preference to the design of the celebrated Milanese sculptor, Edward Tabacchi, professor of the Accademia Albertini at Turin, author, amongst other monuments, of that of Arnaldo da Brescia. Two other eminent sculptors were distinguished, and divided between them the premium of 3,000 lire; Pietro Costa, author of the monument raised to Mazzini in Geneva, and of that in terra-cotta to Vittorio Emanuele in Turin; and Luigi Belli, author of the memorial in Milan of those that fell in battle at Mentana.

To Professor Tabacchi was entrusted the execution of the monument of which we this week give an illustration.

Most of the sculptors competing for the numerous monuments erected to Garibaldi have been and are prepossessed by the idea of associating the memory of Garibaldi with that of the Rock of Caprea, striving to symbolise the grand historical figure of the hero of humanity, separated from the world, upon his self-chosen monument, the solitary naked rock of the Mediterranean.

Professor Tabacchi has himself followed this conception, but has expressed it with artistic moderation, merely indicating the Sardinian Rock, rather than making it, as too many have done, the entire pedestal, and thus too often producing an abrupt and grotesque effect.

The attitude of the hero is that of his last years,—the meditative repose of a man of action as he thinks over the battles fought and won, and who cannot take rest in a world where there is still so much to be done to confer on humanity the, as yet, but-dreamt-of Peace and Justice.

On one side Italy with a star on her forehead, the trump of fame in her right hand, and the national banner in her left,—on the other side the national lion,—are placed on square blocks at the base.

Signor Tabacchi's monument will be erected on the Corso San Maurizio, near the bank of the Po. The statue of Garibaldi will be twice the size of life, and in bronze; the other sculptured parts in marble in the same proportion, and the basement in polished granite.

NEW SCHOOLS FOR THE LEAMINGTON SCHOOL BOARD.

LEICESTER-STREET SCHOOLS.

THESE schools, now in course of erection, are situate at the northern part of the town, and comprise accommodation for 300 boys, 300 girls, and 400 infants, each having separate entrances in connexion with cloak-rooms and lavatories.

The boys' and girls' school-rooms are of equal area, 65 ft. by 20 ft., with four class-rooms to each, and teachers' rooms.

The infants' school-room is 67 ft. by 24 ft., with two large, and one small, class-room, and teacher's room.

The site being about 10 ft. below the street level, advantage has been taken of the difference of level by forming a series of cloisters for playsheds for the boys, girls, and infants, which are constructed partly in brickwork and partly in concrete. The playgrounds are approached by easy inclines from the front and rear, and are laid with Bradshaw & Co.'s asphalt.

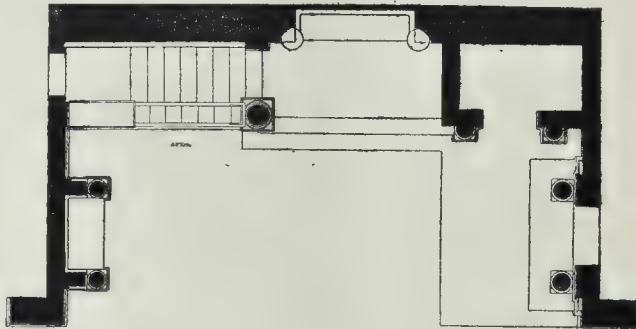
The materials used are local bricks, which

are of a light red colour, relieved with mouldings and bands of Staffordshire brindle bricks, terra-cotta, and Box Ground stone. The roofs, covered with slates, are partly open, and the ceilings boarded, stained, and varnished. The dados of the schools and class-rooms are of wood stained and varnished, and the floors laid with wooden blocks. The porches, passages, and corridors have a dado of glazed bricks, and the floors are paved with Staffordshire quarries. The lavatory fittings are of Macfarlane's manufacture, and the latrines fitted up with Wilcox & Co.'s and Doulton & Co.'s apparatus.

The schools are heated by hot-water arrangements, being made for extra heat being applied to the cloak-rooms for drying wet clothing.

SHRUBLAND-STREET SCHOOLS.

THESE schools are also in course of erection in the southern part of the town, and accommodate the same quantity of children, and are constructed upon the same principle as the Leicester-street Schools.



Plan of Vestibule.

The architect is Mr. John Robert Nichols, of the firm of Messrs. Geo. Benj. Nichols & Sons, of 54, Queen Victoria-street, E.C., and Hands-worth, Birmingham. Mr. John Fell is the contractor for the Leicester-street Schools; and Mr. Thomas Bailey is the contractor for the Shrubland-street Schools. Mr. William Jenkins is the contractor for the heating,—all of Leamington; Mr. W. B. Lait being clerk of the works.

THE CONSERVATIVE CLUB, LIVERPOOL.

THIS important building, of which we give view and plans, occupies a prominent corner site near the Municipal Buildings, and has a frontage of 96 ft. to Dale-street, with return frontages of 107 ft. and 102 ft. 9 in. to side streets. The style adopted is Italian, of a French type, which, as affording a combination of domestic work with palatial architecture, was deemed to be more suitable for the purpose of a city club-house than a too-severe treatment of any particular style. The front towards Dale-street, and the return fronts, with the exception of a portion of the Cumberland-street front, are built of Stourton stone. The portion of the Cumberland-street front referred to is faced with Cliff's white bricks, with red brick arches and stone dressings. The architects of the building are Messrs. F. & G. Holme, of Liverpool, who gained the work in a competition limited to Liverpool architects of the Conservative persuasion.

Communion Table, Canterbury.—It should have been mentioned, in reference to the illustration of this in our last week's number, that the work is of walnut wood, intended to be gilded rather richly when the new reredos is carried out. The latter is to be erected as a memorial to Archbishop Taft from the American and colonial churches. We received these particulars from Mr. Scott too late for publication last week.

VESTIBULE IN OLD GERMAN STYLE OF ARCHITECTURE.

THE drawing of a vestibule represents a design exhibited in the Swiss National Exhibition, held at Zurich last year. The fourth side is thrown entirely open to allow the interior to be viewed. The post in front is only connected with the temporary hall of the exhibition.

The object of the decoration was to display as large a number as possible of Swiss stones, combined in a harmonious whole. Above fifty different kinds of stones, principally rich-coloured marbles, were used in the construction, and the most splendid variety of colour was the result. With the exception of the ceiling (of natural-coloured pine wood), and the medallions and arch over the large niche (of natural-coloured terra-cotta), only pure stone and marble materials have been used, and all the ornamental details have been executed in stone, after designs by the architect.

The accompanying cut gives a plan of the

vestibule. The arrangement, as far as is to be seen in the illustration, explains itself. To the left the large chimney-piece, and the stairs to the dwelling-rooms, at the bottom of which is the cushioned seat under the niche. To the right, in a square projection, the door leading to the cellar, and opposite the fire-place a stone buffet or sideboard, over which was a richly-coloured oil-painting by Brimmer.

The mosaic to the left of the post was made of different stone patterns, and, for the purpose of exhibiting the different stones, was repeated in several parts of the vestibule.

Forty exhibitors took part in supplying the stones, under the direction of the architect; thirty-three received a diploma (or prize), and a great deal of praise for being the means of showing how rich Switzerland is in exceptionally beautiful stones and marbles. The cost of the work was about 1,000l. At the end of the exhibition the vestibule was bought by a Swiss merchant for the purpose of placing in his proposed villa.

Zurich.

A. KOCH.

The Isolation of Children in Hospitals.

When inquiring on behalf of the Local Government Board into the use and influence of infectious hospitals, Dr. Thorne Thorne found that success in securing the isolation of young children had by no means been obtained at once, but that it had been progressive, and that it had been in the main brought about by the steady diffusion of the reports made by previous patients as to the comforts and excellence of nursing obtained within the several hospitals. An instance of this kind is recorded by Mr. Henry May in a recent report on the prevalence of small-pox in Aston Manor. In the case of a child where the parents refused to part with it, when other arguments failed, the mother was allowed to accompany it into the hospital, and, after a few days' stay, she cheerfully left it there. When the first few convalescents had been discharged, the reports they spread of the kindness and comfort they had experienced made the matter of isolation less difficult.—*The Sanitary Record*.

The drawing of a vaulting structure is shown.

The drawing of a vaulting structure is shown. The structure is a simple, rectangular frame with a flat roof. The walls are thick and the roof is supported by a central column. The drawing is a perspective view, showing the structure from a slightly elevated angle. The lines are simple and the shading is minimal, emphasizing the basic form of the structure.



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PROPOSED MONUMENT TO GARIBALDI, AT TURIN.—PROF. EDWARD TABACCHI, SCULPTOR.



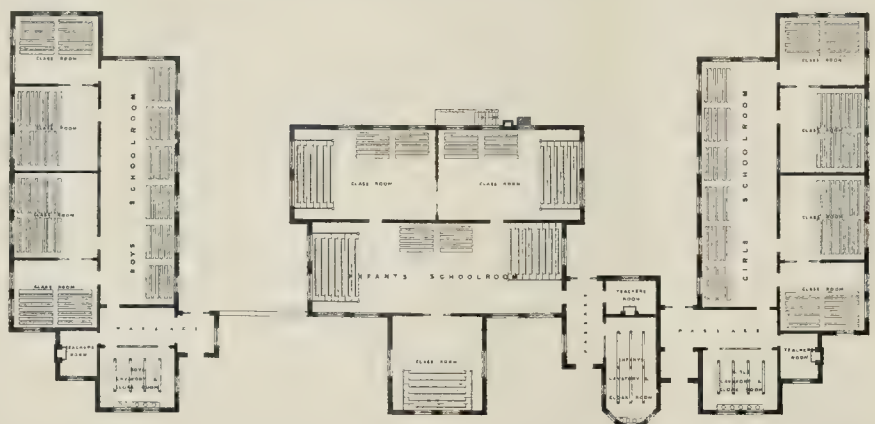
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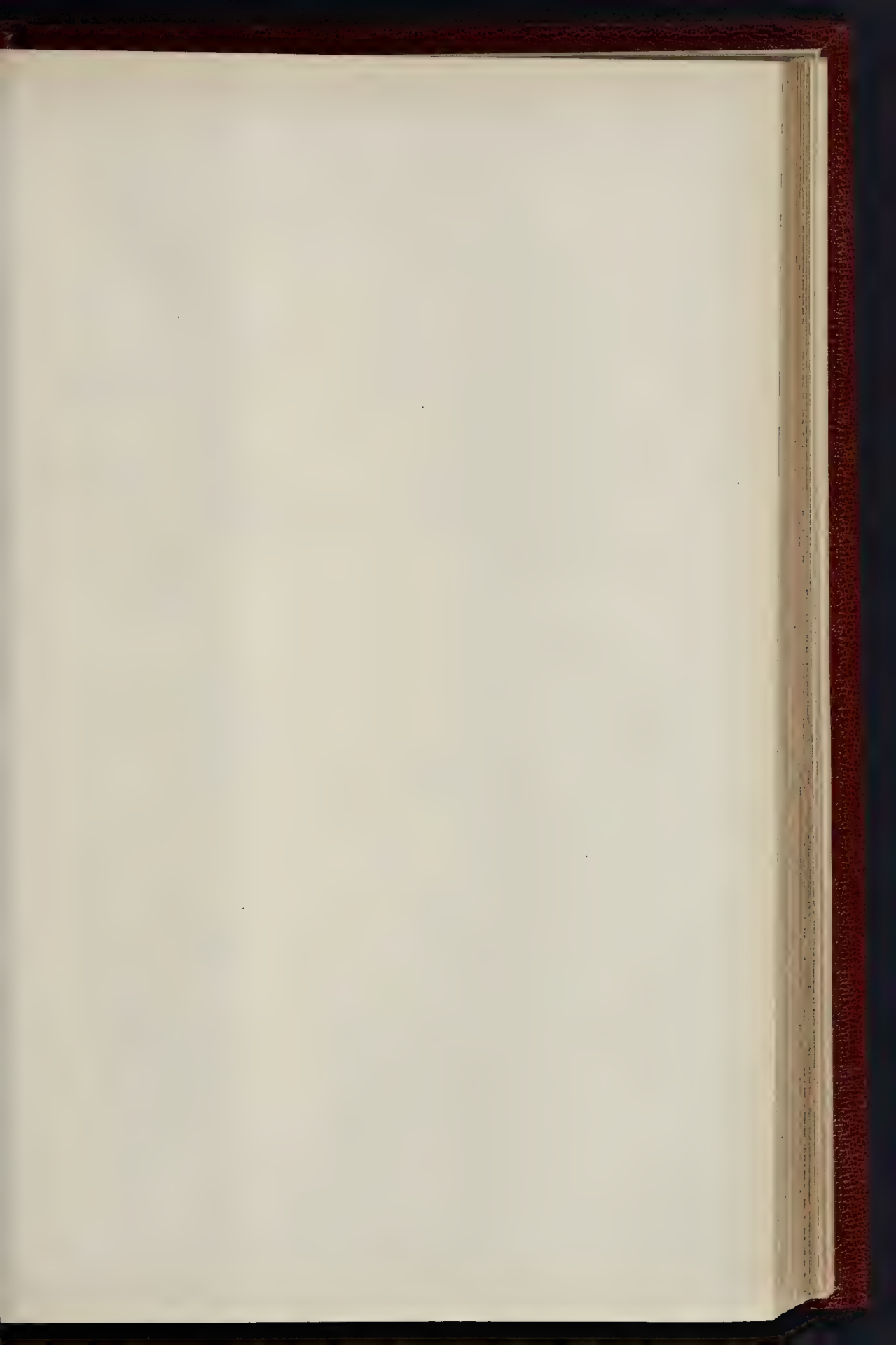
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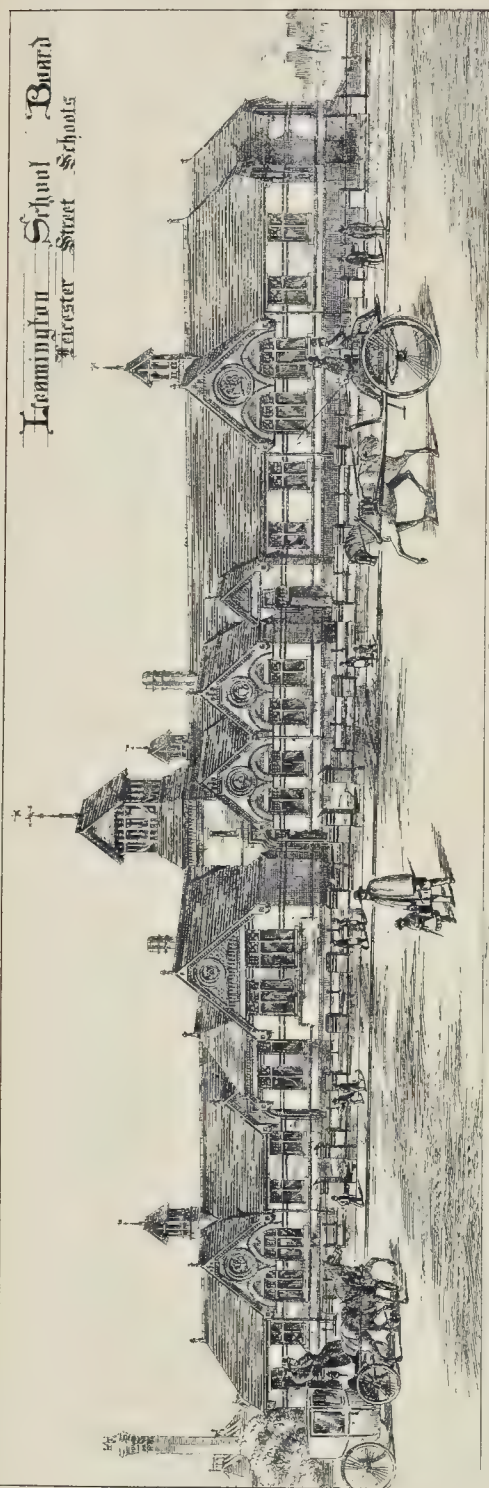
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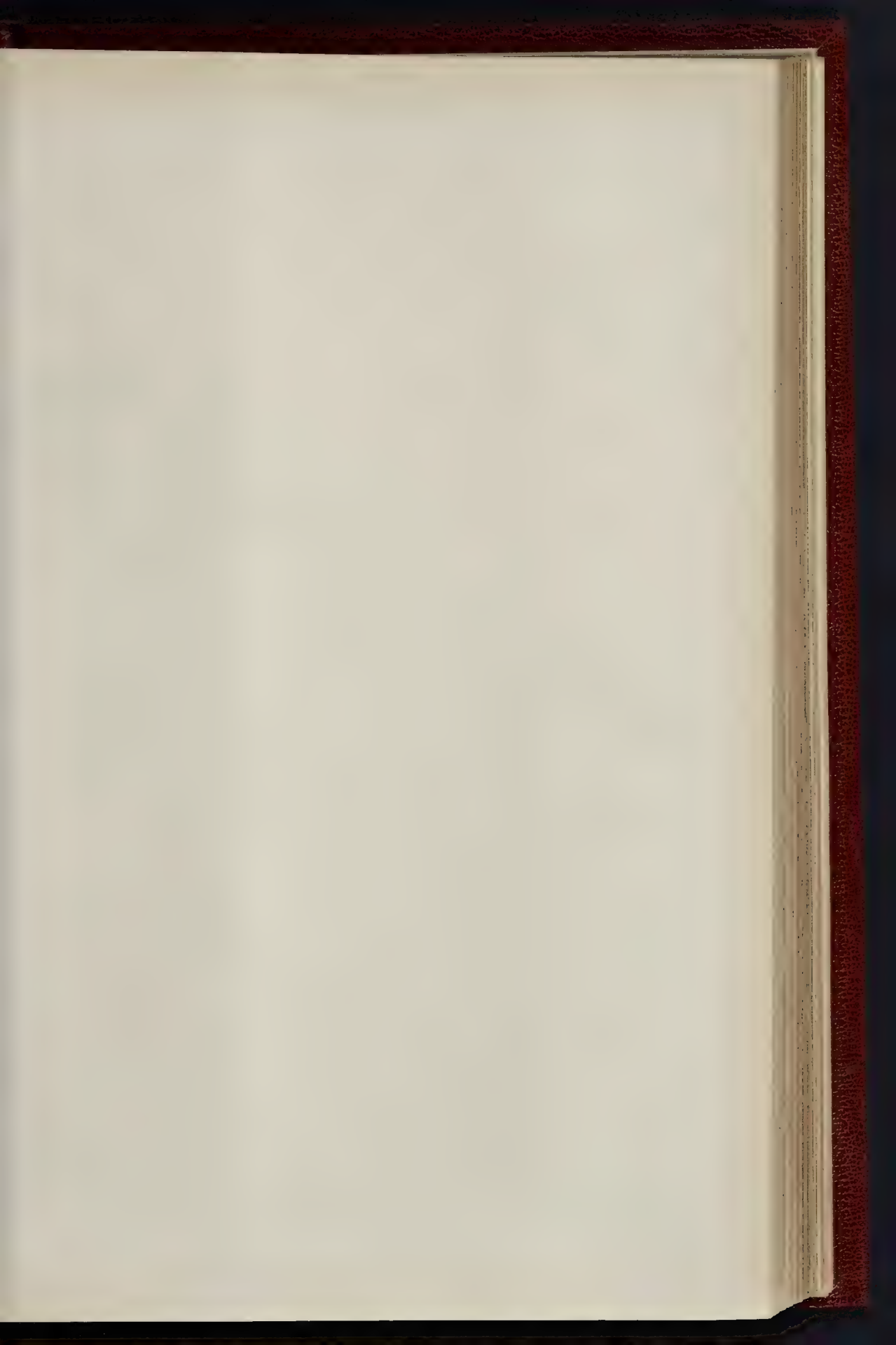
THE BUILDER, APRIL 26, 1884.

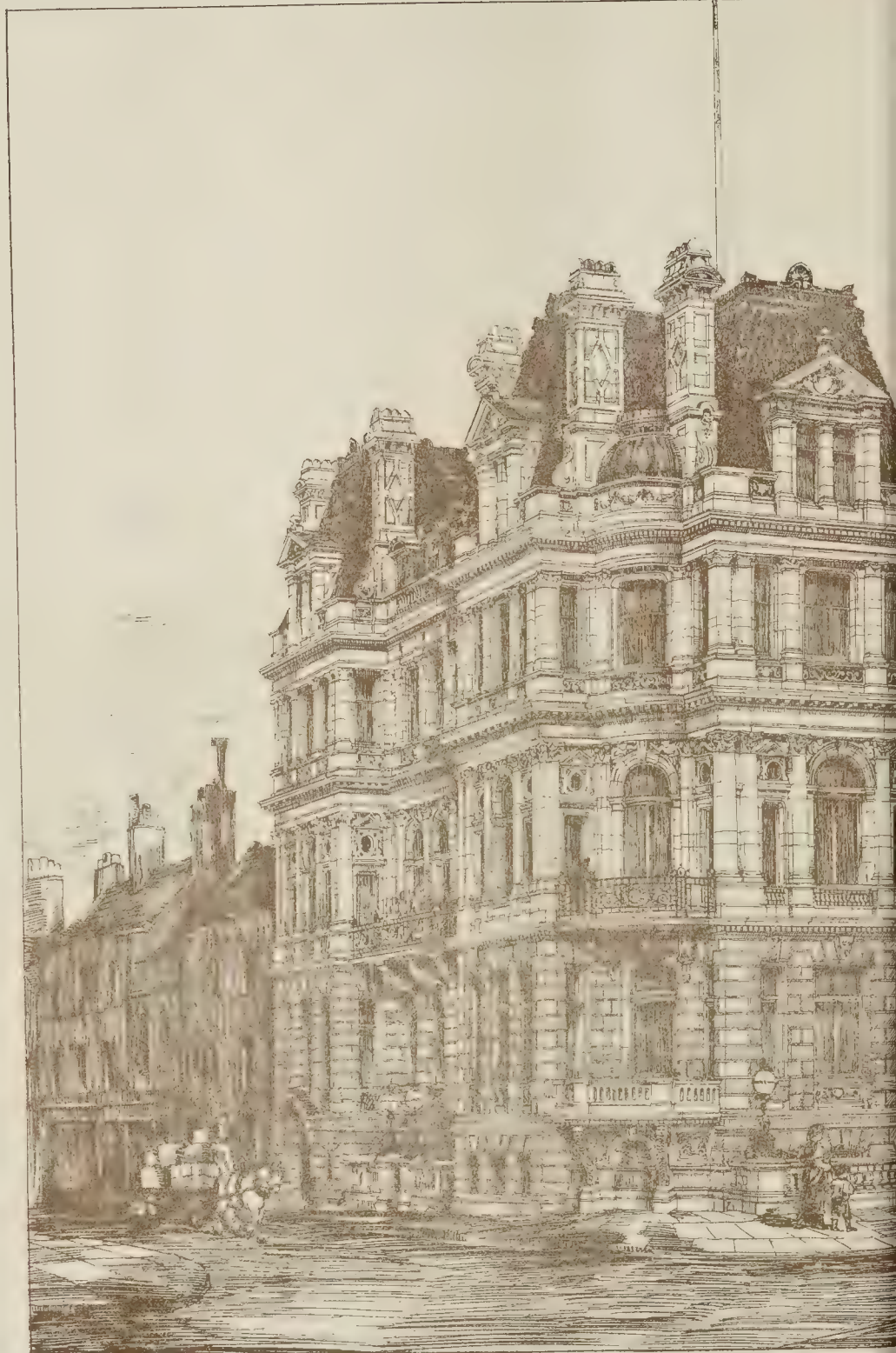
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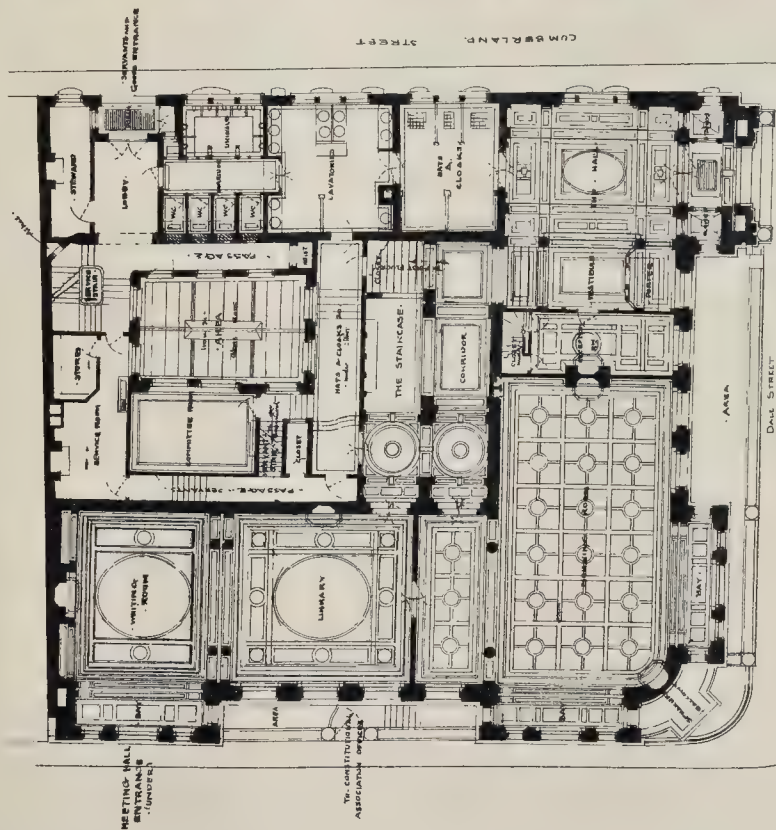


Architectural illustration of the building, London W.

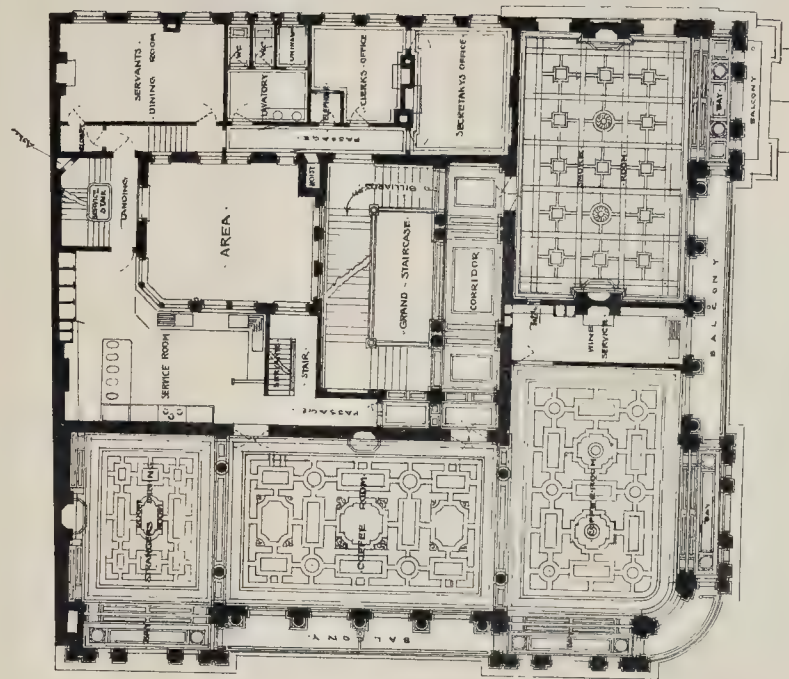


CLUB · LIVERPOOL

Messrs F & G. Holme Architects
8. Westminster Chambers Liverpool



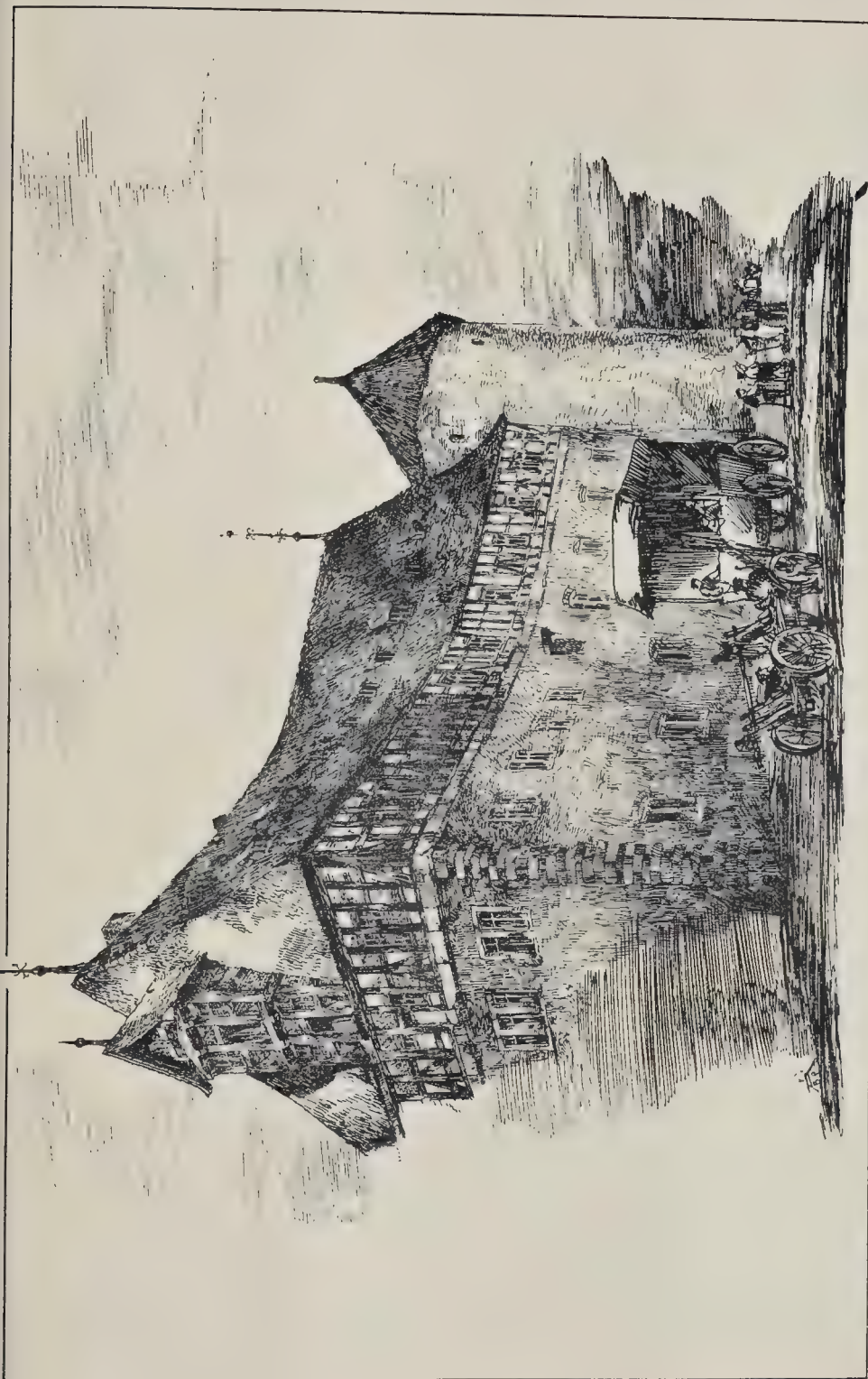
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FIRST FLOOR PLAN

THE CONSERVATIVE CLUB, LIVERPOOL.—Messrs. F. & G. HOLME, ARCHITECTS.

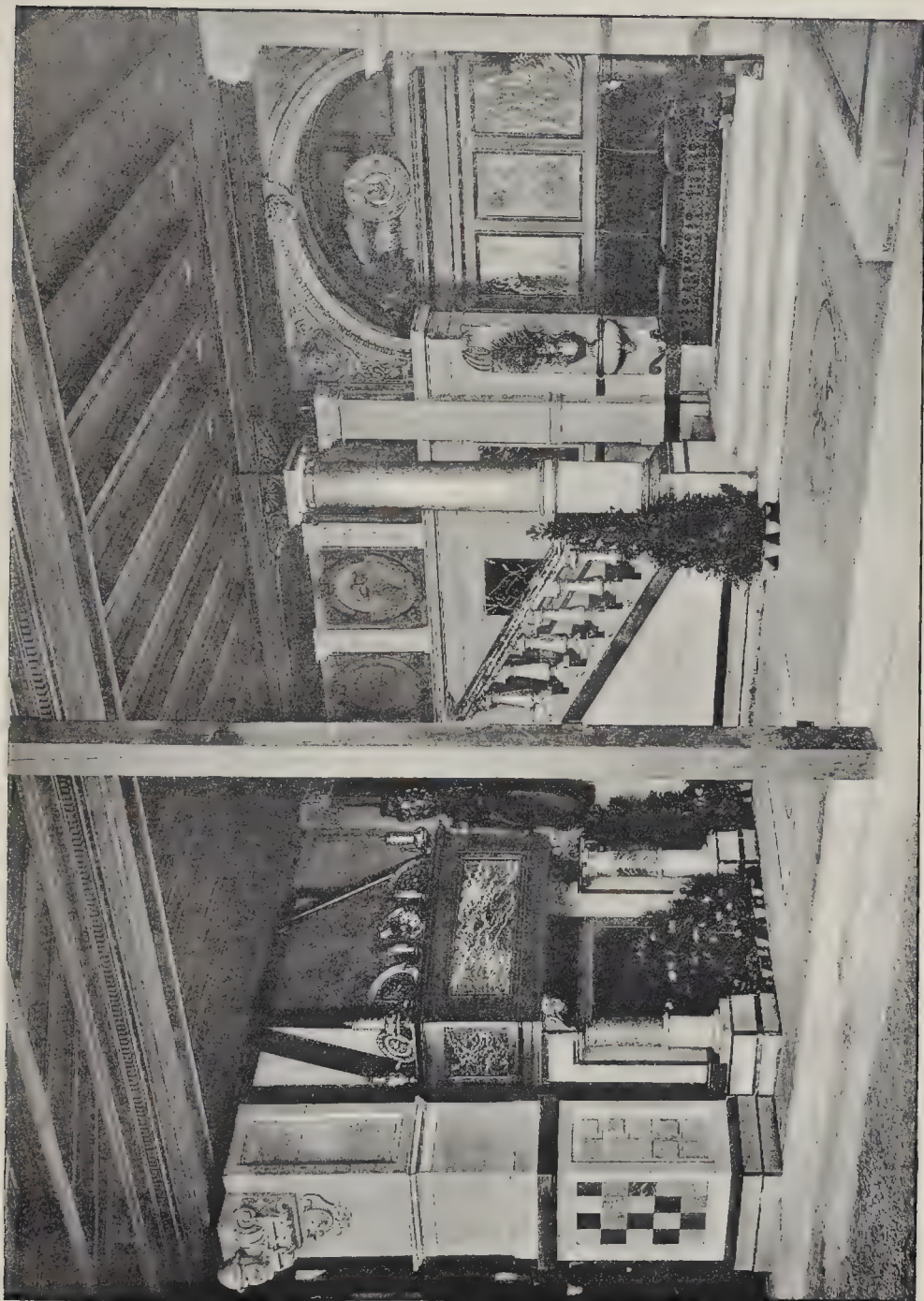
O'Quinn St London, W.C.



Wynne & Sons Printers Queen's

A BARRACK STORE AT HANOVER.

Printed by Wynne & Sons, Queen's



VESTIBULE IN THE SWISS EXHIBITION, ZURICH, 1883.—HEER A. KOCH, ARCHITECT.

The architect or builder had a large and

A BARRACK STORE AT HANOVER.

This picturesque old building, now used as a military store, is built of rubble masonry, grey in tone, with an upper story of black half-timbering filled in with red brickwork, and a steep roof covered with pan-tiles. There is almost an entire absence of those architectural features by which we are accustomed to determine the style of a building; in the gabled dormer alone on the return end (not a front) are any mouldings to be seen, and these naturally are on the under sides of the corbelled beams, the corbels themselves being "shaped." The slightly projecting stone course that supports the upper story has a rounded moulding on its lower edge, but too simple to be distinctive.

The architect or builder had a large and massive building to construct, and has been content to do it (shall we say design it?) without the slightest attempt at architecture, as we now understand the term, his only object being to build as good a store as he could with the materials, and the only knowledge he then needed was how to meet its requirements and purposes.

He seems to have had no acquaintance whatever with the styles of bygone ages and peoples (we do not recollect the existence of any Roman work in Hanover). In all probability he would have failed despicably to answer even the few and simple questions on such matters put to candidates for tests of professional ability nowadays.

He has plunged into no complicated grouping to hide and atone for the broken line of his front; he has not even brought his roof down against the old tower, which already encumbered the site when he began work four centuries ago, but has left the old fellow to tell his own tale uninterrupted and make a finish to that end of the building.

THE MEMBERS' SOIRÉE,
ARCHITECTURAL ASSOCIATION.

A GROTESQUELY illustrated programme, designed by Mr. A. Beresford Pite, gave warning last Friday that the members of the Architectural Association would, in accordance with what has become an established custom, make their annual *soirée* the occasion of a dramatic entertainment. "MacTout" was the title of a species of extravaganza,—partly a travesty on "Macbeth,"—which had been composed expressly for the occasion, and the new Town-hall at Westminster was the place of entertainment. Members began to arrive at half-past seven, and the body of the hall was soon filled,—some gentlemen finding seats in the gallery. After a short interval had been occupied in conversation, refreshment, and smoking, the president, Mr. Cole A. Adams, and the honorary secretaries, Messrs. W. H. Atkin Berry and Herbert D. Appleton, made their appearance upon the platform. A sort of comic business meeting then took place; "minutes" were read, and some amusing sham nominations for membership were announced, amongst which were those of Sir Edmund Beckett, "on the completion of the repairs at St. Albans; proposed by the Clerk of Works"; and Messrs. J. P. Seddon and E. W. Godwin, who were said to have been proposed by Messrs. Aston Webb and E. Ingress Bell. The prologue to the "play" was then recited in verse by the President and Secretaries, after which the dramatic business commenced.

A large placard suspended to the wall, announced, "Scene I.—AN ELIGIBLE BUILDING SITE." Three Witches, impersonated by Messrs. A. Young, E. J. Tarver, and Shepherd, then entered. The question, "When shall we three meet again?" was met by the answer, "When the Competition's won"; in which the key-note of the principal theme for satire was struck. The object of the witches is to play MacTout, a London architect, who is desirous of winning the Admiralty and War Offices Competition. Mr. J. Alfred Gotch, as MacTout, in a dress which was a compromise between that of Macbeth and a modern Englishman, then made his appearance. In the course of a humorous soliloquy, he informed the audience that he had a set of plans ready to be submitted in competition, and then added,—

"Although 'tis true they're Norman Shaw's design,
My name is in the corner,—so they're mine."

The witches, however, warn him of the approach

of Bunkum, an American architect, whose design is destined to win, advising him to steal Bunkum's drawings and send them in as his own. At this point Mr. G. H. Blagrove entered as Bunkum, in a dress that seemed all stars and stripes, and carrying the coveted roll of drawings under his arm. Having made the acquaintance of MacTout, who informs him that he has long wished for "a handle to his name," both call upon the witches to tell them something of the future. The witches respond by "all hailing" MacTout as the predestined recipient of all the honours of the Institute and the Royal Academy; but a position of eminence is not to be attained without some sacrifice:—

"Henceforth, MacTout, cast aside
Quantities, and all beside,
That's consider'd mean and low,
For into the Institute you shall go."

Having heard this promise, MacTout hastens home, to prepare for the reception of Bunkum, whom he has invited to remain beneath his roof. The first scene closes as the witches hail Bunkum with fair promises, in the words, "Thou shalt get prizes, though thou yet hast none."

The second scene was announced by placard, as "THE 1ST FLOOR BACK, TIR BITS VILLA." Here Mr. Bulmer Booth, as Mrs. MacTout, in a gorgeous costume of crimson silk, entered, reading a letter, supposed to have been sent by her husband, to prepare her for the arrival of Bunkum. The letter informs the lady of the honours that have been foretold as in store for MacTout. After an amusing song, in which all the prospective titles, ranging from A.R.I.B.A. up to P.R.A., are enumerated, Mrs. MacTout arrives at the conclusion that her husband will certainly be knighted, an expectation which incites her to sing, "I shall be Lady MacTout, without doubt." MacTout enters here, and introduces Bunkum, who steadfastly refuses to part with the drawings from under his arm, in spite of the solicitations of the hostess, who wishes to take charge of them. Dinner is nearly ready, however, and the unsuspecting Bunkum is ushered out by Mrs. MacTout to prepare for the meal, where, as previously arranged, he is to be drugged with a soporific. MacTout is now left alone, and, while listening for the dinner-bell, his disordered imagination calls up the vision of a T-square, that seems to hover about, perpetually evading his grasp. "I see thee still," he exclaims,—

"In form as palpable as that with which I draw."

But he is summoned by the dinner-bell to the perpetration of his contemplated villany.

In the next scene, Bunkum appears in an advanced stage of intoxication, but still clinging to his drawings, until, being primed with fresh liquor, he drops asleep, leaving them to the mercy of MacTout and his wife, who lose no time in appropriating them, after carrying the unconscious owner to bed.

The last scene, announced as "THE DUST-SHOOT,—HAMPSHIRE HEATH," was, perhaps, the most amusing of all. The three witches, gathered about the cauldron,—a galvanised iron "copper" mounted upon a tripod,—were seen cowering over the blaze of red fire which arose from it. Each bag contributes her share of ingredients to the pot, naming every one as she drops it into the fire. "Notice of a party wall," "Joist all covered with dry rot," "Mousse that rotted under floor," "Knob of brass from off a door," "Crushed hat from the Prince's Hall," were some among the "charms," whose announcement evoked hearty laughter from the audience. Mr. Tarver, as *First Witch*, then "cooled it with an extras bill," after which the cauldron was removed to one side, as MacTout entered to demand knowledge of his fate. His request produced the "three apparitions," the first being the "Practical Man," impersonated by Mr. T. E. Pryce; the second, the "Æsthetic Man," by Mr. Cresswell; and the third, the "Sanitary Man," by Mr. Cranstone, who, with a revolving chimney-cowl upon his head, caused much amusement.

"Design with beauty,—when you find it pay:
To build in truth, you may do any day,"

is the advice tendered by the "Practical Man," and each apparition has a word of encouragement for MacTout. Elated by this, he now demands to know what will be the prevailing style of architecture in the future? This question serves to introduce the "Procession of Styles," in which Mr. Cox appeared as "Egyptian," Mr. St. Aubyn as "Greek," Mr. Gale as "Roman," Mr. Huish as "Moorish,"

Mr. Best as "Italian," Mr. Cranstone as "Gothic," and Mr. Selby as "Queen Anne," each appropriately attired, and carrying a pasteboard symbol of the style he represented. The styles then grouped themselves into a tableau, expressive of the collectionism of the architecture of the future. MacTout here calls for his sketch-book, with the determination of mastering the details of a style comprising such varied elements. Here, however, he is interrupted by a new-boy, who is heard crying:—"Result of the Great Competition." The stratagem of MacTout in appropriating Bunkum's drawings has failed, for the sealed letter has been received by the judges unaltered. Bunkum is announced as the successful man, and the disappointed competitor lays himself down to die. Bunkum now enters, accompanied by Mrs. MacTout, whom he proposes to espouse at the registrar's office, when MacTout returns to life, and induces Bunkum to receive him as partner, threatening, should he refuse, to write to the *Times*, stating that he is unfit to carry out a work of such importance alone. All is now satisfactorily arranged, and Mrs. MacTout announces her intention to

"Give up the Grecian bend,
And on my own constructive lines depend."

At the conclusion of the piece, Professor Kerr made a short speech, in which he congratulated the performers upon the success of their efforts.

IMPROVED DWELLINGS
FOR LABOURERS AND ARTISANS.

We extract the following from a paper on this subject read by Mr. T. Chaffield Clarke at the Surveyors' Institute on Monday evening last:—

In treating of that portion of the subject which may be directly called practical, viz., the character and the extent of the accommodation that has and should be provided, I would suggest two or three principles in new buildings that seem to me essential, though not always observed:—

1. It seems desirable to so construct the rooms that through ventilation from back to front should be possible, and that, as a cardinal point in the planning, the rooms be not laid side by side, but as front and back rooms.

2. That the staircase to the blocks or dwellings should be open to the air, and that each set of rooms should have its private door as if the staircase was the street, and that open galleries should be avoided as destructive of privacy.

3. That in every case where it is possible the arrangement of the closets should be on open galleries, or, at least, entered through a scullery or washhouse, with direct access to the outer air.

4. That the plan of lavatories and water-closets off the staircases is not one that should be extensively followed.

5. That a simple and inexpensive system of fireproof flooring should divide the floors throughout.

6. That, when at all possible, some play-yard or drying-ground should be attached to the buildings, and, if possible, washhouses for laundry purposes.

7. That, in planning the buildings, an effort should be made to enable some rooms to be let off as single rooms, with a power, however, of adding two or three together if needed.

8. To preserve, as far as possible, a cheerful and cottage style of dwelling, as opposed to dull and heavy blocks.

9. Care should be taken that all the sanitary and other appliances should be of the simplest, yet, at the same time, of the strongest character.

10. As a sanitary aid in the construction of such dwellings, that the walls and the ceilings be of the hardest material possible, and often able to be cleaned.

The application of these principles is not always easy, and especially as to the question of single rooms. It cannot be denied that much of the usefulness of this movement would be lost if the plan was largely resorted to of constructing and letting single rooms; but the cost of more than one room has been, practically, the greatest obstacle to the very poor occupying such dwellings, and after the remarkable evidence of Mr. Marchant Williams,

one of the inspectors of the schools for the London School Board, to the effect that, in the Finsbury Division, there are 10,490 families living in one room only, consisting of 41,044 persons, and that there are 17,310 families living in two rooms only, and consisting of 82,216 persons, calls for the most careful attention. Such facts as these make it gravely worth consideration whether it is not possible to design and execute at a cheaper rate than hitherto a class of dwellings having some sort of privacy in the sleeping relations, and yet much cheaper in execution than a system of divided rooms; and the idea has occurred to me that, supposing you extend somewhat the area of the common room, and have a series of partitions movable, either made to hinge or slide, by which you could form bed-closets, not going absolutely to the ceiling so as to interfere with a free circulation of air, but by a little intelligent contrivance on behalf of the designer to render possible a division of the sexes, and at the same time in the daytime to enable such partitions to be back against the walls.

It would be a mistake to consider that the progress in supplying improved dwellings for the industrial classes has either been few or small. It must be patent to all who know London that private enterprise has, in many parts of the metropolis, supplemented the work of societies and associations.

In Clerkenwell, Newington, the Kent-road, Newport Market, Tooley-street, opposite Reid's brewhouse, on the edge of Farringdon-street, and elsewhere, blocks of buildings have been erected, substantial in character, some of them showing good financial results, and affording healthy and comfortable homes for the better portion of the artisan classes; and when we come to inquire into the work of the various associations and societies, we must be hopeful that an effect appreciable and material both as to the health and comfort of the people has been attained.

Taking the reports of 1883, furnished by the societies, I find that the Metropolitan Association for Improving the Dwellings of the Working Classes, which was, in a measure, the pioneer in the movement, being its thirty-ninth report, are housing 5,984 persons, with a death-rate as low as 17·2 per 1,000, declaring a dividend of 5 per cent., and possessing a reserve fund of 15,000*l.*, with a total capital account of over 250,000*l.* I am glad to report that this Association have it in contemplation to erect some sets of dwellings of one and two rooms only, to accommodate tenants of smaller means than their average as now built.

The Improved Industrial Dwellings Company report that with their works in hand they will house about 25,000 persons, having 4,814 dwellings, 140 shops and workshops, with a capital account of about 900,000*l.*, and a rent-roll of 100,000*l.* per annum in round numbers, the sanitary condition of the dwellings receiving careful attention. This company also manages 153 improved dwellings, belonging to private persons and to another association.

The Artisans', Labourers', and General Dwellings Company, which develops estates in a somewhat different way, has a large work in hand. Considerable areas of land, like that at Shaftesbury Park, the Queen's Park, and Noel Park, are purchased, roads formed, and cottage dwellings erected capable of accommodating a single family, but the houses are wisely planned of greater and lesser size to meet the wants of different classes. This company, possessing over 4,000 houses, has a capital and liabilities of over a million and a quarter of money, is now proceeding to cover Noel Park at Hornsey, and has a present rent-roll of over 55,000*l.* per annum. Taking a low average of five persons to a house, the present population must be 20,000, with a large prospective increase.

The Peabody Fund are doing a large and beneficent work. Up to the end of 1883 they had provided for the dwelling of 18,009 persons in 4,959 separate dwellings, with 692 of one room each, 2,073 of two rooms, 1,521 of three rooms, and seventy-three of four rooms. They have expended 1,089,883*l.* 12s. 6d. on land and buildings, with a net gain on the year from rents and interests of 25,252*l.* 16s. 2d. The death-rate was 18·60 per 1,000, the birth-rate was high, and the infant mortality low. It is right to state that the average weekly earnings of the head of the family was 1*l.* 8s. 8d., and the average rent of each room, 2s. 1*l.*d., such rent including the free use of water, laundries, sculleries, and bath-rooms. Such a record does

not pretend to exhaust in any way the accounts even of the associations in existence.

I have referred before to a block of buildings erected by the Fishmongers' Company in Walworth, which contains 255 rooms, including a few shops, in ten blocks of dwellings, and, taking an average of five to a family, probably containing 1,275 persons in residence. The peculiarity of this block is that the cottage system has to some extent been preserved, as the buildings are not high, consisting only of four stories, yards being preserved in the rear.

I have also to record an experiment made at the foot of Southwark Bridge to bring the homes of the working classes close to their daily vocations, and of which I accompany some drawings.

In another instance I have to record with pleasure an experiment made by some friends and myself, where, in Lover-street, City-road, a block of buildings has been erected, not attended with fairly commercial results, where the plan is wisely adopted of a personal supervision of the dwellings by ladies, and a kindly communication kept up with the tenants, thus assisting in the idea so admirably maintained by Miss Octavia Hill and her band of workers.

I mention these few individual results to illustrate how possible it may be, in many neighbourhoods of London and elsewhere, to initial schemes which may have a good and beneficial tendency.

ARCHITECTURAL ASSOCIATION.

VISIT TO KENSINGTON COURT.

The outing of the members of this Association last Saturday afternoon was to Kensington Court, this being the seventh visit this session. Kensington, or "Cheneistum" of the Domesday Book, is one of the most interesting suburbs of London. This neighbourhood is referred to by Swift in his ballad of "Duke and No Duke":—

"Back in the dark, by Brompton Park,
He turn'd up thro' the Gore,
So sunk to Camden House so high,
All in his coach and four."

Kensington has diffused its name so much of late years that it almost seems destined, as stated in an article in our contemporary *Punch* recently to swallow up the whole of London, and something more, in the course of a few years. It has always been a favourite place for the outdoor meetings of this Association, from the re-erection of its Church of St. Mary Abbots, by Sir G. G. Scott, and the South Kensington Museum, in 1871, to the recent meeting at the Brompton Oratory, as described in our pages. The place visited on Saturday was, till lately, the site of the ill-fated Kensington House, the sale and demolition of which were described in the *Builder*, vol. xliii., pp. 107, 410. Opposite to Kensington Court is a milestone, which records that it is "1½ mile from London." The estate is entered by a road, 45 ft. wide, from High-street, and is to have seven houses facing the High-street, two of which are nearly completed. The first house is erected, from designs by Mr. J. J. Stevenson, by Messrs. Holland & Hannen, contractors. The second house is situated at the corner of the new roadway, and is erected from designs by Mr. T. Graham Jackson, M.A., architect. The members were received by Mr. J. T. Carr, the proprietor of the estate, and Mr. William McGill, the clerk of the works, who conducted them over the houses and explained the working drawings and details. Besides the seven houses fronting the High-street, the seventh of which is to be a new branch of the London and County Bank, there are to be seventy houses erected in Kensington Court, the plots for the same being 24 ft. frontages by 80 ft. deep. Thirteen of the houses are now approaching completion; they were commenced last year from designs by Mr. J. J. Stevenson, architect, and are being erected under his superintendence, and that of Mr. T. M. Rickman, who is surveyor to the estate. The design is in what is termed the modern Queen Anne style of architecture; and the contract has been undertaken by Mr. Henry Lovatt, builder, of Wolverhampton; Mr. Roberts being his general foreman of works. The houses are five stories high, and the elevations have red brick facings and terra-cotta dressings; the terra-cotta being supplied by Messrs. Gibbs & Canning, of Tamworth. Each house contains the usual reception-rooms, eight

bedrooms, two dressing-rooms, bath-room, servants' hall and offices, and are to be finished with all the latest modern improvements. The sanitary and ventilating arrangements are being carried out under the superintendence of Mr. W. Yuill. Each house has also separate iron-pipe drains and fittings supplied by the North British Plumbing Company. Electric bells are being fitted throughout the houses by Mr. Julius Sax. The corridors, offices, and open courts in basement will be paved with Stewart's granolithic paving. The floors in the basement are to be paved with wooden blocks.

The cathedral tinted glass has been supplied by Messrs. T. and W. Farmiloe, of Westminster. Hydraulic lifts are to be provided to all the houses by the Hydraulic Power Company (Messrs. Errington & Woodall). Gas will be laid on to all the houses, and wires for electric lighting, and arrangements are being made for lighting the houses, if required, with the electric light. Parquet floors are to be laid to halls, and marble mosaic paving to vestibules and entrance landings. The principal feature of the estate has to be mentioned, and this is no less than brick subways under the roads, 3 ft. 3 in. wide, by 5 ft. 6 in. average height, for the purpose of conveying the water and gas-pipes, electric wires, and hydraulic mains, &c. The main drain, which is immediately below the subway, has been carried out under the direct superintendence of the Kensington Vestry and their officers. The roads, subways, and sewers have all been constructed by Mr. Joseph Mears, of Hammersmith. Each house has two courts, an inner court and rear court, to supply a sufficiency of light to the several apartments. In reply to questions Mr. Carr said each house had cost about 3,500*l.*, and the price asked was 8,000*l.* per house freehold, and the rentals were 400*l.* per annum each. The members lingered a long time in inspecting the several houses, going minutely over them from attics to subways, having assembled at three o'clock, and did not finally depart till six p.m., making a visit of over three hours.

A LOW-PRESSURE WATER-METER.

THE subject of water-meters being likely to become of special practical interest, we publish the drawing and description of one which has been designed by Mr. H. W. Pendred.

A bucket, B, moves up and down between two guide-rods, C C. Four guide-pieces, D, are secured to the buckets, and move on the rods. The upper ends of guides are secured in a cross-bar, as shown in drawing at E. At the centre is a valve-box, F, fitted with a common lifting-valve; if the supply, however, is one of much pressure, a double-beat equilibrium valve can be fitted. On the lower part of the valve-box a lever, G, works on a pivot, H. To this lever is attached a chain, J, which is also united to a rod, K. This rod bears against a valve. A rod, L, moves in a guide, as shown, and its lower end passes through a hole in lid or cover of bucket, and is bent sharply round. On this rod is a collar, M, which engages against curved end of lever, G.

At the back of the cross-bar is a wheel, N, moving on a stud, and a chain or cord is fixed to cover of bucket, and passing over wheel is united to a weight, O.

In the bottom of the bucket is a valve, P, with three guide-rods, R. The valve is balanced by a rod, S, which passes through cover of bucket, and up between forked end of lever, T, a collar fixed upon it rests on lever, as shown, and a weight at other end of T balances valve. The lower ends of guide-rods are fixed in lugs on a receiver, U, and a rest V, for weight O, is cast on U also.

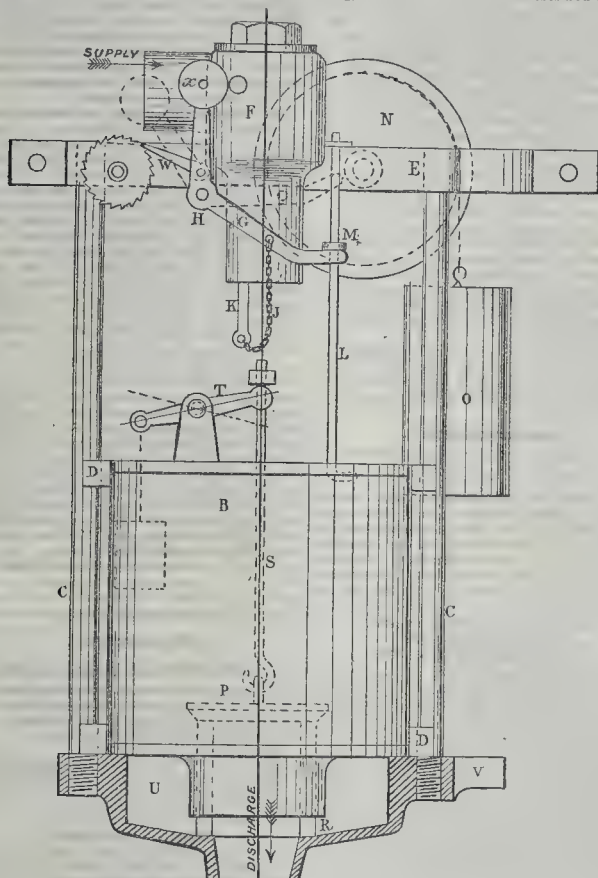
A turnbuckle, or ratchet, W, is mounted on lever, G, and engages in the teeth of counter-wheel as shown. A weight, X, is also mounted on tail of G.

Action of Meter.—When meter is at rest, bucket is kept at top of its stroke by the weight O, and its valve is pressed home to its seat by its rod S, whose upper end rests against a projection on the back of the cross-bar E, and lever G is turned over to position shown in dotted lines. The supply valve is pushed up from its seat by rod K. If water be now turned on it will flow into the bucket until its weight exceeds that of O, when the former descends and draws up O. When the bucket descends a certain distance, its cover meets

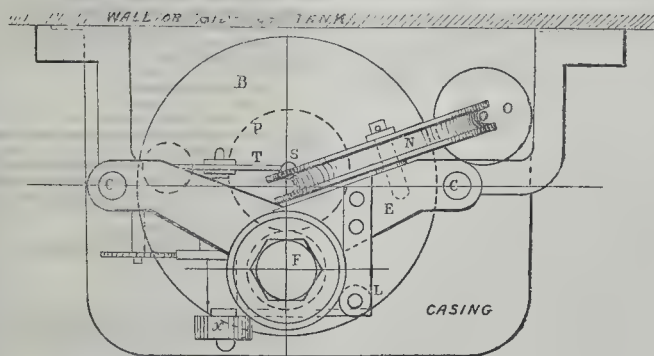
bent end of rod L, and draws L down, and L in turn draws down lever G, thus allowing supply-valve to close, and turning weight X up on a dead centre as shown. The bucket continues to descend till its own valve is lifted by its guide-rods coming against receiver, as shown when water is discharged. When empty, the bucket

which once more descends, and so the action continues; in fact, the water is weighed.

The meter can be set in or over a house-tank, or fitted in any required place, will work at the slowest speed, and needs little lubrication or attention. It can be looked up in a casing, and the counter wheel described will, if



Pender's Water-Meter.—Elevation.



Plan.

Scale.—One-third Full Size for Half-Gallon Bucket.

is then pulled up by O; its own valve is closed by S lifting projection above described, and cover of bucket meeting curved end of lever G, lifts it so far as to throw weight X off its dead centre, and it falls over so far as to throw up supply-valve by means of the lever, chain, and lifting-rod. The water again fills up the bucket,

fitted with an index, register every bucket of water it delivers. No water, however small the quantity, can pass through unregistered, neither will it record more than does so.

All its parts are simple, easy of access for inspection, and not liable to get out of order.

H. W. P.

EDINBURGH.

AMONGST the ceremonials which graced the tercentenary celebration was the unveiling on Friday of the bronze group of Alexander and Bucephalus by Sir John Steel, which occupies an excellent site at the extreme east end of George-street. The group, as formerly stated in these pages, was an early work of the sculptor, and has been subscribed for by the public as a mark of the esteem in which the veteran sculptor is held by his countrymen. The Lord Provost stated that Steel might be considered the founder of sculpture in Scotland, and that he did not, like other Scottish sculptors, leave his native city so soon as his merits were appreciated: hence the public recognition of his merits which led to the work in question being subscribed for and added to the public monuments of the city. It is placed on a pedestal 9 ft. high, which bears on one side, "Modelled 1832,—cast in bronze 1833," and on the other "Presented to the city by the subscribers, 1884." The rearing horse is treated in a very spirited manner, and the youthful prince is cast after the true Greek model, but objection is taken to the drapery, which falls from the figure and gathers in thick folds under the horse's hind-quarters, as being rather suggestive of a sheet than a garment, and it is also thought by some that, although it would have been impossible to produce the reins with which the man is supposed to restrain the horse in marble, yet such might have been done in bronze with good effect. But there is an old proverb to the effect that "a gift horse should not be looked in the mouth," and this gift is really a pleasing addition to the adornment of the city. Another addition to the attractions of the city is the acquisition of Blackford Hill as a public park. This hill is the spot from which Sir Walter Scott makes Marmion view the city when he falls into raptures with the scene before him, and certainly a fairer scene it would be difficult to find; but, besides the view from the summit the hill has other points of attraction in itself. It has been wisely determined to leave it as far as possible in a state of nature, and only to make a few walks where necessary, and probably a drive along the base. The ground extends to 170 acres, and has been acquired from the proprietor, Colonel Trotter, at what is considered the moderate cost of 8,000l. The new suburban railway passes close by the north side of the hill, and a station is to be formed at Blackford Avenue, which will make the new park of easy access from all parts of the city.

THE RECENT EARTHQUAKE.

ON Tuesday morning, shortly after nine o'clock, a sharp earthquake shock was experienced with remarkable distinctness in Essex, Suffolk, and neighbouring counties, the shock being apparently most severe in Colchester. Serious injury was done to buildings in the town. Many chimneys were thrown down, and about 40 ft. of the stone spire of the Congregational Church in Lion Walk fell to the ground. The little parish of Abberton, situated about three miles from Colchester, bears witness to the intensity of the shock which affected the surface of the country. Not only were chimneys thrown down in all directions, but houses were unroofed, and gable walls cracked from top to base. The schoolhouse at Abberton is rendered useless, the roofs having been broken through by falling chimneys, and by the displacement of a large portion of the tiles. Roman Hill, the residence of Mr. Hall, in the vicinity of Abberton, has been extensively damaged, the foundations being severely shaken. At Langenhoe, a few miles further on, the most remarkable evidences of the shock are (according to the *Times*) to be seen. Farmhouses are wrecked, or partially so, all along the high road, while Langenhoe Church, an ancient structure of stone built in the Norman period, is shattered in a manner that would scarcely be credited except by personal observation. The massive tower was so shaken that the heavy masonry fell with destructive force on to the roof above the nave and chancel, utterly destroying the roof for a space of 10 feet square, and filling the interior of the edifice with a mass of debris. The rector, the Rev. Mr. Parkinson, has also suffered severely in the partial demolition of his residence, situate about 200 yards from the church. There were half a dozen chimney

stacks on the house, and these have all been overthrown or twisted on their foundations so as to necessitate their being removed. The walls have been cracked in every direction. Long fissures appear also in the grounds surrounding the house, particularly on the hand-rolled gravel walks. Mr. Parkinson says he felt the shock at 9.20 a.m. in a series of undulations accompanied by a twisting motion. The shocks, —for there were more than one,—lasted for about half a minute, the length of time occupied by the shock being particularly noticed by Mr. Parkinson. Fortunately none of the inmates of the house suffered any palpable injury, although they were much terrified by the alarming movement. Several farmhouses in the vicinity of the rectory have suffered severely by being partially unroofed, and by the gables falling out. Altogether the damage in this parish amounts to several thousand pounds. In a southerly direction from Langenhoe lies Peldon, a much larger parish, and the spectacle here presented to the traveller from the high-road is of an extraordinary character. It is a literal fact that not a single dwelling or building of any description in Peldon has escaped injury in a greater or less degree. From the church on the hill down to the lowest cottier's dwelling destruction has been wrought on every hand, the seismic movement exerting itself in some cases in the displacement of masonry and brickwork in a most fantastic way.

The shock was experienced in Leicestershire, in Sussex, and in London, notably by some workmen engaged on the Victoria tower of the House of Lords. Mr. Deykin, the superintendent, who has been for ten years engaged in all the repairs to the pinnacles, towers, and spires of Westminster Palace, reports that, according to his calculation, the tower rocked 4 in. out of the perpendicular.

Mr. G. J. Symons, F.R.S., writes asking those who are able to do so to send information, with the view of having the facts investigated by scientific men. He observes that earthquake shocks sufficiently violent to injure buildings are so rare in the British Isles that he believes there is not a single observatory provided with a seismometer, or earthquake recorder.

IMPROVEMENTS IN LOCOMOTIVE ENGINES.

This was the subject of a paper read at the meeting of the Liverpool Engineering Society on the 9th inst., by Mr. John B. Fell, who commenced by pointing out that the locomotive engine has already been brought to such a state of perfection that there might appear to be no need of further improvements, and that these if made must rather relate to new developments of its powers, or new applications of them, than to the ordinary work in which it is at present employed. Therefore the improvements dealt with in the paper were those relating to (1) high speed locomotives; (2) increased economy in working expenses; (3) engines for working upon steep inclines or mountain railways. The present average maximum speed of the locomotive engine is from forty to forty-five miles an hour, upon which no advance has been made for many years, but during the last twelve months there has been a discussion in the engineering and scientific papers as to the practicability of increasing that speed on railways of 4 ft. 8½ in. gauge to an average maximum speed of sixty miles an hour, and to a speed of eighty miles an hour on railways with a 6-ft. or a 7-ft. gauge. The conclusion arrived at was that this could not be done with any existing type of locomotive, but that it might possibly be accomplished if certain conditions could be complied with, the most difficult of which is the providing of the necessary additional amount of boiler power, which could not be done with a boiler placed as at present over the engine and limited in width to the space between the driving-wheels. The only possible arrangement by which this object can be effected appears to be that of separating the boiler from the engine, giving it the place now occupied by the tender, and removing the water and coke to the carriage carrying the engine, by which means ample space could be provided for both engine and boiler, and there would be no difficulty in producing double the quantity of steam in the same time that is produced by the most powerful express engines now in existence, and consequently running at double the present speed

upon a railway of a suitable gauge. The second part of the paper related to the application of the new arrangement of the parts of a locomotive to engines for working heavy goods and mineral traffic. In this case a much larger amount of adhesion has to be provided, the additional mechanical power being employed not for obtaining an increase of speed, but an increased force of traction at a low speed, by which means heavier trains may be drawn without increasing the load on any one of the engine axles, and a reduction effected in the working expenses by the use of a more economical form of boiler. The third part of the paper consisted in a description of recent improvements in centre rail engines, which have been designed for working on the proposed Transalpine Railway over the passes of the Mont Geneva.

ADMIRALTY AND WAR OFFICES COMPETITION.

SIR,—I do not sneer at "untried fish," as your correspondent "Another Non-Competitor" [p. 559] avers, but am convinced that competition is the ruin of the architectural profession, and that it would be far better for the younger members even, that they should attain gradual but assured eminence, rather than, by a lucky throw in a gambling transaction, find themselves famous before their time, with the need, in order to maintain that position, of continually joining in similar undignified scrambles for work afterwards. In other professions there is something to work up to, but in the architectural profession, thanks to this practice, but little, as almost all its prizes are put to competition. I deny that the result of the system has been satisfactory to the public; and believe that all the really good men who have gained competitions would have done better work, if not so much, and would have come to the front without it; and I think the saddest part in Sir Gilbert Scott's career is the record of the manner in which he made use of this system. I do not say that I never compete, because one must conform to the conditions, however hard and bad, of the age in which one lives. Nor do I object to such a competition as that of the Law Courts, because all the competitors were fairly paid for their work, and were selected, presumably with care, from among those who had proved their ability and standing in the profession. I was once asked to compete for a large building, and wrote in reply to offer to throw two hundred pounds (my estimate of the cost of the set of drawings) into the sea, with any number of architects similarly inclined, on condition that one should be chosen by lot from the number, and properly commissioned afterwards, but that I objected to the loss of my time and temper, as well as of my money; and I added that I felt sure that any one of them could do better, with the advantage of communication with his employers, than the best could do without it. The very framing of instructions for a competition is a farce, the competition cruelty to animals (for even an architect is an animal, and has feelings), and the judgment, by the most learned and just of judges, at best a compromise.

JOHN P. SEDDON.

Queen Anne's Gate, April 21.

SIR,—As an architect of liberal opinions, and one of your correspondents whom you allowed to say a few words on the above subject when, just twelve months ago, it was first announced by Mr. Shaw-Lefevre, I should like, if you permit, to protest against the intimations contained in Messrs. Godwin and Seddon's unfortunate letter in the *Times* of April 3. The only motive of the letter appears to be a sudden fit of disappointed ambition. The appointment of architect to this great national building is on the eve of being made, and they,—architects of eminence who have proved themselves capable of designing and carrying out a public work,—have not taken the necessary steps to secure it. They have scant respect for the preliminary nine, among whom, as they say, "we fail to find the name of one architect of eminence"; and they are disappointed accordingly in not having taken part in a race, which, for them,—first-rate architects,—would have been "a walk over."

Then surely the imputation of improper motive is most unjustifiable. Mr. Seddon and his friend may have more knowledge and information upon this matter than others, but it is impossible for any reasonable person to believe that honourable and independent men like Mr. Lefevre, Mr. Christian, and Mr. Hardwick, would lend themselves, for an instant, to preparing "a cleverly-arranged scheme" to prevent "any

known first-rate architect being employed" as architect to the New War Office. And I think that all who have read the conditions of this competition, and consider for a moment the circumstances of it, will answer the final appeal to reason in the letter with an emphatic negative.

The words are as follow:—"Does it not stand to reason that it would have been better, that this sum [£5,400] should have been devoted to securing the recognised ablest talent in the country which was at its disposal, rather than be parcelled away on the chance that in this limited selection of [nine] untried fish should be found the whale that Sir Edmund Beckett and others are in search of?"

This proposition is just twelve months too late to be of the slightest use, even if it were accepted as a good one, which I think it is not.

In April, 1883, you allowed me to give reasons for an contrary course, and I observed that your correspondent "Non-Competitor" ably supports this view in your last issue.

Both Mr. Seddon and Mr. E. W. Godwin have done beautiful work. It is a thousand pities that they should have allowed unworthy feelings to tempt them to write the curious letter referred to. Perhaps, however, they may have something to justify. As the letter stands, it is not calculated to create a very high opinion of our honourable profession, which, at present, is scarcely appreciated as it deserves to be. JUSTITIA.

RESTORATION AND ANTI-RESTORATION.

SIR,—In reply to the letter of Mr. Harry Hems, in your issue of the 19th inst. [p. 559], we beg to say that our remonstrance against the so-called restoration of the altar-screen at St. Alban's Abbey was made to Mr. Gibbs, as we did not know to whom else such a remonstrance could be addressed.

At the time we wrote, Mr. Hems's name was not known in connexion with this work. We may be allowed to express our surprise that Mr. Hems, being a member of this Society, should have undertaken this work without giving the committee an opportunity of expressing its opinion.

THACKERAY TURNER, Secretary.

STEVENAGE, HERTS.

SIR,—The interesting brass of Stephen Holland (who was recto here in the early part of the sixteenth century), in eucharistic vestments, has just been removed from the chancel, in order that a tawdry pavement of tiles might be put down. In addition to this, the screen of one bay in the south chapel has also been removed, in addition to the misericorde. Much indignation is felt on account of these acts of Vandalism, as they were done without even a faculty, or the calling of a vestry meeting.

Stevenage, April 23, 1884.

S. B. CHITTENDEN.

ANTS IN HOUSES.

SIR,—For the information of your correspondent, "Subscriber of Twenty Years," I may state that in India I have found the following method succeed very well for ridding a house of ants:—Tie a good-sized piece of meat (pluck or liver would do) to a bit of string; place it near the ants' nest; as soon as covered with the insects, dip the meat in a bucket of boiling water, then dip the bait again. I fancy that ants tell each other about the matter; at any rate, the colony invariably migrated after the treatment described by me.

MADRAS.

CYANITE.

SIR,—Referring to the remarks on cyanite in your issue of the 12th inst. [p. 539], will you allow us to point out that the fact which you state, viz., that "cyanite sinks into the wood instead of forming a mere coating," is in itself a proof that cyanite retains its efficacy for a very much longer period than any ordinary paint?

E. E. MARRIOTT,
Managing Director of the Cyanite Co. (Lim.).

Sanitary Reports.—Accompanying Dr. F. W. Barry's elaborate report to the Local Government Board on the sanitary administration of the Tynemouth district, we have received a memorandum from the Medical Department at Whitehall, signifying that for the convenience of members of the medical profession and others, copies of certain of the Reports made to the Board by their Medical Inspectors are now placed on sale, and may be had from Messrs. Knight & Co., Fleet-street; Shaw & Sons, Fetter-lane; Hadden, Best, & Co., Strand; or P. S. King & Co., Westminster. The greater accessibility thus given to some of these reports will no doubt be an advantage to those who are studying the sanitary condition of the country.

CHURCH BUILDING NEWS.

Sutton.—St. Barnabas Church, Sutton, Surrey, although incomplete as regards its tower and north aisle, has just been consecrated. It is in a poor district of the ever-rapidly increasing so-called "town" of Sutton. The building of St. Barnabas Church has been helped by the Bishop of Rochester's Fund, and at present holds more than 500 people. The plan is that of a three-aisled church, with the aisles confined along the chancel. Excepting for its easternmost bay, the aisles are wide and have lofty arcades and large windows, rendering a clearstory unnecessary. The material is red local brick and Box Ground stone. Adjoining the church, at its western end, is a large building used as a Sunday school-room and for parish purposes. Near the church, on the already acquired site, will be the vicar's house. The church has temporary seats, pulpit, font, &c., arranged by the Committee (for the sake of economy) without the advice of the architects. The pavements and glazing are, however, permanent. The architects of the buildings are Mr. B. Herbert Carpenter and Mr. B. Ingelow; the clerk of works Mr. Barnaby; and the contractor, Mr. Shillotee. The cost has been about 4,000l. exclusive of fittings.

Newport (Mon.).—The Church of St. Woolos, Newport, one of the finest Norman structures in Wales, has recently received additions in the shape of brass altar-rails and an eagle lectern, which were manufactured by Messrs. Jones & Willis, of Birmingham and London.

Forest Gate (Essex).—The new Church of St. Saviour, Forest Gate, was consecrated by the Bishop of St. Albans on the 1st inst. It is situated at the angle of the Macdonald and Station roads, upon a site presented by Canon Carver. The style of architecture adopted is that of the Early English period; the material of the walls, both externally and internally, is red brick, Bath stone being freely used for the windows, doorways, arches, &c. The church consists of nave, chancel, north and south aisles, and transepts, and is arranged to seat 1,000 people. The roof from end to end of the church is wagon-vaulted, the line between nave and chancel being defined only by the lofty chancel arch which is carried up to the apex of the vault, and is concentric with the curves of the ribs of the roof. These ribs bear upon detached grey stone shafts, which rest upon sculptured corbels of intricate conventional foliage. The corbels are the gifts of various friends. On the south side of the chancel is a spacious organ-chamber; on the north side two vestries (clergy and choir) capable of being thrown into one when required for meetings, &c. Ample means of ingress and egress are provided by a south porch, a lobby at the west end of the north aisle, and a temporary porch occupying a portion of the site of the future tower and spire. The paving throughout is of tiles, and the reredos is formed of majolica tiling. The whole has been supplied and fixed by the Campbell Tile Company. The pulpit is of Caen stone, relieved with Cornish serpentine polished shafts; the capitals, cornices, &c., being elaborately carved. This, as well as the brass eagle lectern, are the gifts of Canon Carver, the donor of the site. The church has been carried out from the designs of Mr. Edwin Clare, F.R.I.B.A., the contractor being Mr. J. Morter. The carving has been executed by Mr. Allen; the heating and lighting by Messrs. Z. D. Berry & Sons. The total cost of the works, exclusive of special gifts, will be about 7,500l.

STAINED GLASS.

Dumfries.—Two windows, of three lights each, in the church of the Grey Friars, have been filled with stained glass by Messrs. Powell Brothers, of Leeds. One window is devoted to illustrations from the story of the Good Samaritan, and the other the Ascension of our Lord. Mrs. Barker, of St. Catherine's, was the donor.

Hyde (near Manchester).—A four-light west window has been presented to St. George's Church, Hyde, by Mrs. Horsfield, in memory of her husband and second son. The window contains the figures of St. John the Baptist, St. Paul, St. Peter, and Cornelius the Centurion. Two other windows have been presented to the church,—one by Mr. R. Hall, in memory of his wife; and the other by Mrs. Payne, in memory of her husband. The one presented by Mr. Hall contains the figure of St. Elizabeth and the

Agnus Dei. The one given by Mrs. Payne contains the subject, "Christ Healing the Sick Man," and the emblem of St. Luke. These three windows were designed by Mr. T. W. Camm, and executed by Messrs. R. W. Winfield & Co., Birmingham.

Arbroath.—A three-light Munich stained-glass window has just been erected in St. Mary's Church, Arbroath, to the memory of the late Mrs. Durno, wife of the present incumbent. The subject is the "Raising of Lazarus," and the artists are Messrs. Mayer & Co.

PROVINCIAL NEWS.

Portsmouth.—The new episcopal residence for the Roman Catholic see of Portsmouth is now just completed, and Bishop Virtue and the priests attached to the adjacent cathedral have taken up their residence therein. The house is a handsome and substantial building in the French Gothic style of architecture, and is situated in the Edinburgh-road, overlooking the red facing bricks; the dressings, with elaborate tracery and carvings, being of Ham Hill stone from the quarries of Staple & Hann, of Stoke, Rimsister, giving the building a warm and pleasing effect. The roofs are covered with Broseley tiles of a dark tint; the flat over the bishop's reception-room and bay being formed of rolled iron joists, moulded Mansel varnished beams and binders, covered with Portland cement concrete, and finished with Claridge's Patent Sessell Asphalt laid by the company's workmen. The wooden sashes and frames are of Indian teak, but the principal windows are glazed with plate glass in the stone mullions and jambs, the tracery being filled in with lead lights in tinted glass of geometrical patterns. The house contains upwards of thirty rooms, besides the offices. The four principal rooms are large and handsome, viz., the bishop's reception-room, the library, common hall, and dining-room, the floors of the two first being of the best wainscot oak in various widths; with this exception the finishings to all the principal rooms are in pitch-pine varnished. The ground and second floors are laid with pitch-pine block floors laid herring-bone-wise, and the first floor corridor with wainscot oak parquet flooring, wax-polished. The principal staircase is a very handsome work entirely of stone, the steps and landings being of Portland moulded nosings and beaded under the spandrels, the balustrading and heavily moulded hand-rail being of Corsham Down stone, from Messrs. Randall & Saunders's quarries. There is on the first floor a small chapel, the roof being formed of moulded ribs and picked deal varnished match-boarding, the entrance-door Gothic tracery-hood being very effective. The hot-water work and gas-fittings have been executed by Mr. F. Shalders, of Southampton. The work has been carried out in the space of thirteen months, by Mr. John Crook, builder, of York Building Works, Northam, from the designs of Mr. J. S. Hansom, architect, 27, Alfred-place, South Kensington. The clerk of the works was Mr. E. A. Harrison; the general foreman, Mr. W. McGowan; foreman of masons, Mr. J. Hockey; the carving and sculptural work, both externally and internally, being executed by Mr. W. H. Palmer, of Chelsea. The cost of the works has been about 7,500l. We gave a view of the residence in the Builder for June 9, 1883.

Braintree.—A Local Government Board Inquiry was held at Bocking on the 18th inst., by Mr. Stephen H. Terry, Assoc. M. Inst. C.E., one of the Board's Engineering Inspectors, respecting an application from the Braintree Union Rural Sanitary Authority for sanction to their borrowing 500l. for a scheme of sewerage, the plans for which have been prepared by Mr. Alfred B. Brady, A.M.I.C.E., of Maldon. The scheme was opposed by some of the ratepayers, on the ground that it did not comprise the whole of the village, and by others who lived at some distance from the portion proposed to be sewered, on the ground that though they would have to share the cost. A memorial, signed by a number of gentlemen, was presented to the Inspector, praying that a special drainage district might be formed, so as to exclude the outlying district. After hearing the evidence *pro* and *con*, the Inspector walked over the locality, accompanied by some of those ratepayers who were present at the inquiry, and promised to report to the Local Government Board in due course.

Books.

Hints on Sanitary Law. By G. F. Chambers, Barrister-at-Law. London: Published for the National Health Society, by Allman & Son, 67, New Oxford-street. MR. CHAMBERS is already well known as the author not only of an elaborate digest of the law relating to public health, but also of numerous legal and general handbooks. The task of compiling this little book could hardly have fallen to a more competent person. In a series of sixty-three numbered paragraphs contained in twenty-three sections, Mr. Chambers gives the inhabitant of London an epitome of the law in regard to sanitary matters of all kinds in the metropolis and the suburbs. We confess that we regret that this book is not just a trifle larger, and with a hard binding, for these pamphlet-like little volumes are apt to defeat their purpose by their very modesty. They are lost or consigned to waste-paper baskets, and are never forthcoming when required for reference. It will sufficiently show the character of this work if we extract one paragraph from it. No. 32, under Section xii., Nuisances, is as follows:—"Notice of a nuisance may be given to the Local Authority by (1) any person aggrieved thereby, or by any of the following persons: (2) the sanitary inspector, or any paid officer of the authority; (3) two or more inhabitant householders of the parish or place to which the notice relates; (4) the relieving officer; (5) any police officer of the district; or in case the premises be a common lodging-house, (6) any person who has been appointed an Inspector of Common Lodging-Houses." In the margin Mr. Chambers gives us the references to the several statutes, which will be found to be very numerous. As Mr. Chambers truly enough points out, while all England, except London, is governed by a proper code in the shape of the Public Health Act, 1875, London, as regards sanitary matters, is regulated by a number of fragmentary Acts. It is much therefore to be hoped that whenever the new Municipality for London comes into being, and into working order, one of its first tasks will be to formulate a sanitary code for the metropolis. For it would not only be a step to increase convenience of reference, but would place a branch of the law with which all London householders should be acquainted, in a plain and intelligible form.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

April 12.—6,268, J. Halley, Milingavie, Roofing plates in lieu of Blakes or Tiles.—6,274, J. Hartill, Dudley, Window-blind Racks.—6,281, V. Brown and J. Marshall, Denton, Covering Doors.—6,303, J. Bonner, Newcastle-on-Tyne, Chimney-top or Ventilator.—6,306, E. Page, Forest Gate, Gully Trap for Sinks.—6,333, W. Smeaton, London, Waste-water Preventers.

April 15.—6,355, W. H. Stephenson, Blackburn, Ventilating and Warning.—6,358, W. Smeaton, London, Water-waste Preventer.—6,362, A. C. Henderson, London, Metal Roofing Tiles. Com. by L.J.C.V. Corvin, Paris.—6,370, J. Carter, London, Window Sashes.—6,387, H. A. Dufrenoy, Paris, Stoves. Com. by A. Espéron, Isoire, France.—6,388, H. A. Dufrenoy, Paris, Parquet Flooring. Com. by F. E. Guerin, Paris.—6,394, E. Tomlinson, London, Fire-places.—6,395, E. Tomlinson, London, Ventilation, &c.

April 16.—6,398, C. Harding and W. Huxley, Moseley-road, Greenhouses, &c.—6,400, H. James and G. Robinson, Sheffield, Blind Actions.—6,409, W. H. Kersting, London, Roller Blinds.—6,428, E. Edwards, London, Buglar Alarm. Com. by H. Gibot, Paris.—6,430, M. Bower, Crawley, Racks for Blinds.—6,431, R. Weaver, London, Water-closets.

April 17.—6,440, J. Everard, Sparkbrook, Window-sash fasteners. 6,448, J. T. B. Bennett, Aston, Sash-fasteners.—6,457, H. T. Gurner, London, Automatic Fastening for Double Doors, &c.—6,480, C. H. Adames, London, Fire-grates or Stoves.

SPECIFICATIONS ACCEPTED.†

April 18.—6, H. W. Frampton, Winchester, Hexagon Glazed Metal Roof and Upright Framing.—1,211, E. P. Perkins, Birmingham, Window-blind Rollers.—4,635, W. J. E. Henley, and E. J. E. Henley, Anorley, Concrete Building.—4,725, W. R. Lake, London, Flushing, &c., Sewers. Com. by P. Burke, Salt Lake City, U.S.A.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending April 19, 1884.

3,775. T. W. Webber, Kellyville, Odley, Construction of Roofs. (Aug. 1, '83, price 6d.)

On the rafter, which has a flat top and is chamfered off at the sides, is placed a saddle-shaped strip of metal with a groove on each side to carry off the water. The panes of glass are laid on this strip, and another strip is placed above, and across passing through both strips and between the edges of the panes secure all to the rafter.

4,259. R. Adams, London, Toothed Racks for Opening and Closing Fanlights, Windows, &c. (Sept. 4, '83, 6d.)

These racks are flexible, as a joint is made at every tooth. They can be actuated by a worm or by a pulley, and the rack can be rolled up in a receptacle therefor or allowed to hang down when it has passed the worm or pulley.

4,308. J. C. Bloomfield, London, Manufacture of Bricks, Tiles, Slabs, and Blocks of Building Material. (Sept. 7, '83, 2d.)

These are made of a mixture of gas tar, powdered chalk, and sand or burned ballast, which are melted together and run into moulds.

4,342. B. J. B. Mills, London, Domestic Heating Apparatus. Com. by V. Ducloux, Beaujon, France. (Sept. 11, '83, 6d.)

The fire-places or stoves are surrounded by a double casing divided into several compartments, through all of which air must pass to be heated.

4,641. C. G. MacWilliam, London, Water-closet Basins. (Sept. 29, '83, 6d.)

The basin and its trap are formed in one piece above the floor line. The trap rises from the bottom of the basin and its bend is above the top of the mouth of the trap, so that the upper edge of this mouth forms a dip, and the water that is retained in the basin will always cover the dip and form a seal. From the bend the trap passes down to the outlet, which is situated under the centre of the basin, and by this outlet the basin is connected directly to the soil-pipe.

5,884. G. Howard, Cricklewood, Fixing Flooring. (Dec. 21, '83, 4d.)

Dovetailed tongues are secured in lengths in the joints which engage in grooves formed in the under-sides of the flooring boards.

MEETINGS.

SATURDAY, APRIL 26.

Artists' Benevolent Fund.—Seventy-fifth Anniversary Dinner (Freemasons' Tavern), Sir Coutts Lindsay in the chair.

St. Paul's Ecclesiastical Society.—(1) Visit to the Priory of St. Dominic, Maitland-road, Haverstock-hill. 2.45 p.m.

(2) Visit to the Church of St. Augustine, Kilburn, under the guidance of Mr. J. L. Pearson, F.S.A. 4 p.m.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (I.) The Colosseum. 3 p.m.

Birmingham Architectural Association.—Mr. W. Tonks on "Exhibitions and Museums."

MONDAY, APRIL 23.

Society of Arts.—Mr. J. Norman Lockyer on "Some New Optical Instruments and Arrangements." (Cantor Lecture.) 8 p.m.

TUESDAY, APRIL 29.

Art Union of London—Annual Meeting and Prize Distribution: Adelphi Theatre, 12 noon.

Institute of British Carriage Manufacturers.—Mr. H. Julian on "Art applied to Coach Building." 7.30 p.m.

Institution of Civil Engineers.—Discussion on Mr. W. E. Rich's paper on Vertical and Horizontal Engines. 8 p.m.

Society of Arts (Foreign and Colonial Section).—Mr. W. Henry Penning on "The Transvaal Goldfields." 8 p.m.

WEDNESDAY, APRIL 30.

British Museum.—Mr. W. St. Chad Boscawen on "The Dawn of Civilisation in the Land and Cities of Nimrod." 4 p.m.

Society of Arts. Mr. J. W. Willis-Bund on "New Legislation as to Freshwater Fisheries." 8 p.m.

Edinburgh Architectural Association.—Mr. Hippolyte J. Blanc on "Heating and Ventilating Appliances."

THURSDAY, MAY 1.

Society for the Encouragement of the Fine Arts.—Dr. J. S. Phené on "Art in America." 8 p.m.

Royal Archaeological Institute.—(1) The Rev. J. Hirst on "The Religious Symbolism of the Unicorn." (2) Mr. J. F. Hodgetts on "The Scandinavian Element in the English People." (3) Mr. J. G. Waller on "Fourteenth and Fifteenth Century Brasses." 4 p.m.

Institution of Mechanical Engineers.—(1) M. Georges Marié, of Paris, on "The Consumption of Fuel in Locomotives." (2) M. Paul Drouville, of Paris, on "Portable Railways." (3) Mr. Michael Logridge on "The Mosecrop Engine Recorder and the Knowles Supplementary Governor." 7.30 p.m.

Royal Institution.—(1) Annual Meeting of Members, 1.30 p.m. (2) Professor Dewar on "Flame and Oxidation." (II.) 3 p.m.

Chemical Society.—8 p.m.

FRIDAY, MAY 2.

Architectural Association.—Mr. A. Beresford Pite on "Cathedral Planning." 7.30 p.m.

Institution of Mechanical Engineers.—(1) Mr. A. Slater Savill on "The Automatic and Exhaust Steam Injector." (2) Mr. Robert Gordon on "Apparatus used for Testing Current-Meters at Torques." (3) Mr. Edgar P. Rathbone on "The Francke 'Tina' or Vat Process for the Amalgamation of Silver Ores." 7.30 p.m.

Royal Institution.—Prof. J. W. Judd on "Krakatos." 9 p.m.

SATURDAY, MAY 3.

Architectural Association.—Visit to the Central Technical College, South Kensington. 3 p.m.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (II.) Edinburgh Architectural Association.—Visit to Dalhousie Castle and Newbattle Abbey. (II.) The Roman Forum. 3 p.m.

Miscellaneous.

British Archaeological Association.

The tenth meeting of the session was held on the 16th inst., the chair being occupied by Mr. Thos. Morgan, F.S.A., who read a description, by Mr. J. Pierce, of the Roman Amphitheatre recently discovered in Paris. It is near the Rue Monge, not far from the Pantheon, in the slope of the hill towards the Jardin des Plantes. 20 ft. of earth have been removed from above the ruins, and some of the passages have been cleared and there are several of the seats for spectators remaining, and many more it is expected will be met with. The masonry is of small squared stones. This is a remarkable discovery, which hitherto has not had much public attention directed to it. A discussion followed, in which several speakers referred to the probable existence of an amphitheatre in London, while the buried condition of St. Alban's Theatre was deplored. The Rev. S. M. Mayhew then concluded his paper on "The Antiquities of St. David's," which are to be visited during the coming congress. Special reference was made to the seriously dilapidated condition of the cathedral prior to its recent restoration by Dean Allen. The works have resulted in the security of the building and the discovery of many interesting details of the ancient work, which were described. A second paper was then read by Mr. W. de Gray Birch, F.S.A., in the absence of its author, Dr. Wake Smart, on the antiquities of Nursling, and of various Roman roads which passed through the district of the Test River. The course of one across the Test River at Nursling was traced, and descriptions were given of the old castle at Birley Beacon, a British encampment, and of Tatchbury, where several Roman roads converge and the Test was crossed.

Progress of the Inner Circle Completion Railway.—The works for the completion of the Inner Circle Railway, between the Mansion House Station and the Tower, are fast advancing, and Mr. Walker, the contractor, expects to be able to take an engine from one end to the other in about a month from the present time. Workmen are now busily engaged in connecting the metals at the Mansion House station with the extension in progress in the direction of Cannon-street, where there is to be a new station, and one at King William-street. The construction of both stations is now going forward. The first-named station will be at the corner of Cannon-street and Dowgate-hill, with entrances in both streets, and two shops in Cannon-street are about to be taken down for the purposes of the station, and to make way for the Cannon-street entrance. A considerable portion of Cloak-lane, from College-hill to Dowgate-hill, is closed for public traffic during the progress of the works. The King William-street station is being constructed on the site of the Weigh House Chapel, and there will be an entrance to this station in Fish Street-hill, as well as in King William-street. That part of the line which runs under Cannon-street, between the corner of Dowgate-hill and King William-street, is already completed, as well as some other sections, including the whole length between the east end of Great Tower-street and the company's station at Tower-hill.

The Need of Public Baths in America.—At a time when the condition of the tenement-house classes is attracting so much attention, and philanthropic persons are directing their efforts to the character of the buildings in which these people live, it occurred to us that a description and history of the public baths and wash-houses in England might direct attention to the fact that such facilities for personal cleanliness are lacking in this great city during eight months of the year, when our climate renders our floating swimming-baths of no use. If, by calling attention to what has been done elsewhere, we can influence the establishment of public baths in our American cities where bathing may be done in winter as well as summer, it will, in our judgment, be another practical step in the movement to improve the physical surroundings of our working-classes.—New York Sanitary Engineer.

Sanitary Condition of Clerkenwell.

The present sanitary disorganisation of the metropolis places almost insuperable difficulties in the way of obtaining trustworthy mortality statistics for the various sanitary districts into which London is divided. Sir Charles Dilke recently referred in the House of Commons to the overcrowding which he had found to exist in insanitary and dilapidated dwellings in Clerkenwell. As a rejoinder to this statement the local Vestry instructed their clerk to forward to Sir Charles Dilke copies of the reports of their medical officer of health for the past six months. These reports are stated to show that the rate of mortality in Clerkenwell compared the rate of mortality in other parishes in the metropolis, and within the metropolitan area generally. Now, it is a fact that the parish of Clerkenwell, which forms one of the metropolitan sanitary districts, contains no public institution,—no workhouse, and no hospital. Most of the sick poor from Clerkenwell, therefore, whether they die in workhouses or in hospitals, die outside the parish. We cannot say that we have seen the special reports, of which copies were sent to Sir Charles Dilke, but we have never seen a health report for Clerkenwell in which any serious attempt was made to bring into account the deaths of Clerkenwell residents who die outside the parish. It is needless to say that without such correction the mortality statistics of this parish are worse than useless,—they are misleading. The mean recorded death-rate in Clerkenwell during the three years 1880-81-82 was, it is true, only 18.6 per 1,000. Assuming, however, that Clerkenwell contributes its due share (according to population) of the workhouse deaths in the Holborn Union, which there is no reason to doubt, this would raise the death-rate of the parish to 22.0 per 1,000. Moreover, on the assumption that Clerkenwell also contributes its due quota to the deaths in the metropolitan hospitals, another addition of 2.0 must be made to the death-rate, raising the corrected death-rate for the parish to 24.0 per 1,000. Now, as the mean death-rate for the whole of London in the three years 1880-81-82 did not exceed 21.4 per 1,000, the apparent anomaly of the co-existence of the over-crowding in insanitary dwellings observed by Sir Charles Dilke, with a remarkably low death-rate, is susceptible of explanation.—*Lancet.*

Fallen Greatness.—The case of the *Great Eastern*, destined at one time to achieve great things, is an example of how low greatness can fall. We learn that arrangements are in progress to begin work upon this vessel very shortly to fit her for a career as a coal-hulk in Gibraltar Bay. Permission for her anchorage has been obtained from the Colonial Office. The project is viewed also with favour by the Admiralty, as the *Great Eastern* will effect a great improvement in the bay by dispensing with the multitude of small coal-hulks which now encumber the harbour. The company having the matter in hand have carefully calculated the suitability of this giant of naval architecture for a coal-hulk. Her paddle engines and boilers are to be removed, and she is to have numerous side-ports added to those already existing, by which the coal will be received for storage purposes. The coal from these ports will, by its own gravitation, run into a variety of receptacles, some well above the water-line, others below. The vessel is to have powerful hydraulic cranes on the upper deck, whereby the steam colliers from Cardiff and Newcastle bringing the coal will be very quickly discharged, thus saving greatly in cost on the existing system as practised at Gibraltar. The coal, once on board, will be shot down under the bunker receptacles on board the Atlantic and other large steamers taking in their coal alongside. A further advantage is that the *Great Eastern* will give such shelter to coaling from her in the bay will, it is expected, be able to proceed in weather when it is quite impracticable with smaller hulks. It is considered that these various advantages will at length open out for this vessel a trade in which her size will be a positive recommendation and economy, in lieu of, as hitherto, an impediment to success. The vessel will be fitted with the electric light, so as to be ready to take in coal and deliver it at night as well as by day.—*Iron.*

New Post Office, Knutsford.—The designs of Mr. Wm. Owen, A.R.I.B.A., 134, Deansgate, Manchester, have been selected in open competition for new Post-office buildings to be erected at Knutsford, Cheshire.

Mosaic Work.—Messrs. Burke & Co., of Newman-street, Oxford-street, have just carried out two important works in a remarkably short space of time. The first was a mosaic pavement at the head office of the National Provincial Bank of England. Worn-down Portland stone landings had to be worked off, and a mosaic pavement, covering an area of from between sixty and seventy yards laid thereon between the Thursday night preceding Good Friday and the Wednesday morning following, no work being allowed between the hours of 9 a.m. and 4 p.m. on the Saturday, between midnight of the same day and 6 a.m. Monday morning, nor between 9 a.m. and 5 p.m. on Tuesday. The time occupied, therefore, on the work *in situ*, allowing for meal times, was sixty hours, equal to six working days, whereof half was taken up in working down the stone. The architect, Mr. Charles R. Gribble, has expressed himself well pleased with the rapidity of the work. The second job was at the Turkish Baths, Jermyn-street, and had to be carried on in a temperature of 135°. The old marble pavement was removed, concrete put in, and a mosaic pavement laid between Thursday evening and Tuesday morning. We are informed that Messrs. Burke & Co. are enabled to lay mosaic floors thus rapidly in consequence of having the cubes or tesserae faced by machinery before being gummed on to the brown paper in the usual way, thereby saving the time previously required to sand down the irregular and rough surfaces. This firm is carrying out a large order for mosaic paving at the Technical Institute, South Kensington, under Mr. Waterhouse, A.R.A. We may also mention that they a short time ago laid a mosaic pavement at Marlborough House for H.R.H. the Prince of Wales, under Mr. John Taylor, architect.

Assyrian Antiquities.—By permission of the Trustees of the British Museum, and under the patronage of Major-Gen. Sir Henry Rawlinson, K.C.B., the Rev. George Rawlinson, Camden Professor of Ancient History in the University of Oxford, and author of the well-known work on "Ancient Monarchies," and of Professor Fergusson and Mr. Hormuzd Rassam, the Assyrian explorer, Mr. W. St. Chad Boswell will commence, on Wednesday, April 30, a series of six afternoon lectures on the "History, Literature, and Archaeology of the ancient Empires of Assyria and Babylonia." The subjects to be treated of in the series are:—1. The Dawn of Civilisation in the Land and Cities of Nimrod. 2. A Chaldean Temple: its History, Architecture, and Ritual. 3. Traditions of Eden in Legend and Art. 4. The Bible and the Monuments. 5. Nineveh and its Palaces in the Golden Age of Assyria. 6. The Influence of Assyria on the Culture of Surrounding Nations. The lectures will commence each afternoon at four o'clock, in the galleries of the British Museum, and will be illustrated by the antiquities there exhibited, and by maps and plans specially prepared. Tickets for the course or single lectures may be obtained from Messrs. Williams & Norgate, 14, Henrietta-street, Covent-garden; or from W. B. Cutler, 36, Great Russell-street, Bloomsbury.

Telegraph Wires.—Mr. E. Gregson Banner has patented an improved method of providing for the laying of telegraph and other wires, and gas-pipes, &c., with a view to combine economy with accessibility, by laying them within a concrete kerb made in upper and under blocks having a hollow channel between them, the upper blocks to be removable by lifting rings. Similar blocks to be arranged to carry the wires across a street where necessary, the blocks in this case to form a course level with the roadway, or forming part of a crossing. The idea seems worth entertaining.

Wood Block Flooring.—An improvement has been made in the method of laying wood block flooring, by Messrs. Geary & Walker, of 7, John Dalton-street, Manchester. It consists in the securing of the wood blocks to their cement, asphalt, or other foundation, by means of metal keys, which prevent the blocks becoming loose. The improvement has been patented, and the flooring will be known as "Geary's patent 'Premier' system of wood block flooring."

Birmingham Master Builders' Association.—At a meeting of the committee, held on Monday last, at the Grand Hotel, Mr. Wm. Sapote in the chair, Mr. Ernest J. Bigwood, of the firm of Edwards, Son, & Bigwood, Temple-row West, was elected secretary to the Association.

New Public Hall at Peckham.—A spacious public hall which has for some time past been in course of erection at Peckham is now nearly completed. Within the last few days the building has been covered in, and it is expected it will be finished and formally opened in the course of a month. It is situated a short distance to the rear of the houses and shops on the south side of Rye-lane, and will be approached from that thoroughfare by a covered way 12 ft. in width. The ground-floor contains several apartments, the principal one being 45 ft. long and 26 ft. wide, and intended to be used as a news-room. On the same floor there are also three smaller rooms, intended to serve as committee-rooms. A spacious stone staircase leads up to the first floor, which contains the public hall, the principal apartment in the building. It occupies nearly the whole area of the edifice, being 50 ft. in length, 43 ft. in width, and 22 ft. in height, and is estimated to seat an audience of about 1,200 persons. At one end there will be a platform extending the entire width of the hall, and arranged for orchestral purposes. The second floor contains another large room, which it is expected will be appropriated as an art gallery. It is well adapted for this purpose, being amply lighted from the top. Mr. J. Wilkins, of Peckham, is the architect of the hall, which has been erected by and for Mr. W. Dowton, the owner, under the superintendence of his own manager.

New Industrial Dwellings at Camberwell.—Amongst the large number of shops and other new premises which are now in course of erection in Church-street, Camberwell, consequent upon the widening of that thoroughfare by the Metropolitan Board of Works, Messrs. Colls & Sons, builders and contractors, have just taken on lease a plot of the vacant land on the east side of the road, on which they have commenced the erection of several blocks of industrial dwellings for artisans, which, it is stated, will accommodate about 250 families, and a population of something like 1,500. The buildings will have a frontage to Church-road, upwards of 100 ft. in length, and about 120 ft. in depth. A large number of shops and other business establishments have already been erected along the widened thoroughfare. Several other buildings of a similar character are now in course of erection, and when these are completed nearly the whole of the vacant land which the Metropolitan Board of Works have had to dispose of in this thoroughfare will be covered.

Quick Work.—In another paragraph we make mention of the rapidity with which certain mosaic work was executed. Here is an item showing expedition in another department of work:—Messrs. North & Son, of London-road, Southwark, some time ago obtained, in close competition, a large order from the Guardians of Kensington, for the recovering of five large roofs at the Infirmary, with best galvanised corrugated iron, and were allowed three weeks to complete the same, under heavy penalties. The work was done in two weeks, by the aid of improved machinery, without in any way disturbing the patients.

Paddington.—The stained-glass window in the new chancel at St. Saviour's, Paddington, is now finished and in its place on the right of the chancel. The subject is "The Ascension," and the window, which is the gift of Mr. John Welford, of Home Farm, Harrow-road, in memory of his late wife and their five children, is treated in the style of the fifteenth century. The window is by Mr. S. T. Matthews, of Queen's-road, Baywater. The figure windows on the opposite side of the chancel have been altered and re-arranged by the same artist.

Social Science Association.—The Standing Committee on Health met on Tuesday, Sir Richard Temple, bart., in the chair, when the provisions of the Dwelling-Houses Inspection Bill were considered. A resolution was unanimously passed regretting that, as its clauses were of such an impracticable and unjust character, the committee were unable to give the measure their support.

TENDERS.

For repairs, alterations, &c., to St. James's Church, Piccadilly. Mr. J. T. Wimperis, architect:—	
Durant	£3,412 0 0
Patrik & Sons	2,462 0 0
Stanley Bird	2,135 0 0
Scrivener & Co.	2,073 0 0
Bywaters	1,989 0 0
Brass	1,743 0 0
Fish, Frezige, & Co. ..	1,632 0 0
Lea	1,379 0 0

For the erection of artisans' dwellings, Minorities, for the Metropolitan Railway Company. Mr. Walter Graves, architect. Quantities by Mr. Pollard:—	
J. Mowlem & Co.	£24,900 0 0
Ward & Lambie	49,619 0 0
G. Shaw	49,284 0 0
W. H. Hobbs	45,000 0 0
J. Morter	45,000 0 0
J. Clemence	45,000 0 0
Perry & Co.	48,371 0 0
Colls & Son	47,885 0 0
W. Brass	47,400 0 0
Wall Bros.	45,971 0 0
J. T. Chapple	44,739 0 0
	42,814 0 0

For works in connexion with erecting new girls' school at Upper Stratton, near Swindon, Wilt., for the Stratton St. Margaret School Board. Mr. William Drew, architect, Swindon. Quantities by the architect:—	
Phillips, Swindon	£1,430 0 0
W. Jones, Gloucester	1,260 0 0
Wiltshire, Swindon	1,219 0 0
Looker, Stratton (accepted) ..	1,210 0 0

For alterations and additions to Rhine House, Lower Edmonton, for Mr. C. B. Harrison. Mr. H. F. Brown, architect:—	
Fairhead	£692 10 0
Sargent	850 0 0
Coldwells	760 0 0
Kent	695 10 0
Sharman	679 0 0
Reed (accepted)	581 0 0
[Architect's estimate, 682.]	

For the proposed restoration of the Church of St. Margaret, at Titchfield, Test, Somerset. Mr. Alex. Nelson Hansell, architect:—	
Notes (for the Rev. T. B. Hyson and Restoration Committee):—	
F. Cox, Yeovil	£1,049 0 0
C. Trask, Norton-sub-Hamdon ..	1,046 0 0
F. Fane, Stoke-under-Ham	680 0 0
Church (for the Right Hon. the Lord Alington):—	
F. Cox	£538 0 0
F. Fane	545 0 0

For new lecture hall, Brondesbury, for the Baptist Church. Mr. John E. Sears, architect. Quantities by Mr. Fleetwood:—	
Cheesum	£1,850 0 0
Ashby Bros.	1,843 0 0
Robert	1,747 0 0
Staines & Son	1,738 0 0
Marland	1,692 0 0
Nightingale	1,692 0 0
Tarrant & Son	1,689 0 0
Scriver	1,689 0 0
Higgs	1,625 0 0

Accepted for 2,500 tons of broken granite, for the Sharnbrook Highway Board. Mr. Eaton, surveyor:—	
The Enderby and Stoney Stanton Granite Company, at prices and stations as follow:—	
Rumholme-street, at 8s. 6d. per ton.	
Ramds-street, " 8s. 6d. "	
Irchester-street, " 8s. 3d. "	
Sharnbrook-street " 8s. 6d. "	
Oakley-street " 8s. 6d. "	

For making new road and pipe sewer at Hornsey, for the Imperial Property Building Society:—	
Bell, Wood Green	£1,417 0 0
Dunmore, Hornsey	1,314 0 0
Walker, Islington	1,185 0 0
Pizzey, Hornsey	1,191 0 0
Wilson, Walthamstow	1,150 0 0
Adams, Hackney (accepted) ..	1,089 0 0

For making new road at Alsdern Green, Wiltshire:—	
Wright	£537 0 0
Beadle Bros.	465 0 0
Pizzey	480 0 0
Bath & Blackman (accepted) ..	419 0 0

For making new road and surface-water drain for the Chiswick School Board:—	
Bottoms Bros.	£291 0 0
Clayton	811 0 0
Neave	770 0 0
Priestley	769 0 0
Hare	671 17 10
Pizzey	669 0 0
Rowell & Robson	647 0 0
Ball (accepted)	589 0 0

For new roads and pipe-sewers on the Russell Estate, at Chiswick:—	
Simmons	£1,180 0 0
Bloomfield	1,029 0 0
Adams	989 0 0
Bell	980 0 0
Nichols	873 0 0
Pizzey (accepted)	835 0 0

For pulling down and rebuilding the George public house, Waterloo-road, for Messrs. Watney & Co. Mr. C. W. Bovis, architect:—	
Clark & Bracey	£4,970 0 0
Hall, Biddall, & Co.	4,774 0 0
Fish, Frezige, & Co.	4,763 0 0
Patman & Fotheringham	4,753 0 0
* Drawn for in favour of Patman & Fotheringham.	

For alterations and additions to St. Petroc chapel-cess, Dartmouth. Mr. George H. Birch, architect 68, Lincoln's Inn-fields:—	
Dart, Crediton	£3,721 0 0
Dave Bros, London	3,475 0 0
Blowey, Plymouth	3,420 0 0
Pillar & Sons, Dartmouth	3,165 17 6
* Accepted, with deductions.	

Accepted for new hospital for infectious diseases at Ashford, for the Staines Joint Hospital Board. Mr. Hampden W. Pratt, architect, Furnival's Inn:—	
John Bottrill, Reading	£3,499 0 0
[Full list of tenders published in Builder for March 23.]	

For hall, lavatories, refreshment departments, offices, and shops at Herne Bay, for the Herne Bay Pavilion, Pier, and Promenade Company, Limited. Mr. C. N. McIntyre North, architect, 15, Borough High-street. Quantities supplied:—

Richardson Bros., London.....	22,365 0 0
W. Downs, London.....	2,319 0 0
J. Marland, London.....	2,339 0 0
Ingelton, Herne Bay.....	2,295 0 0
C. Ford, Whitstable.....	2,187 0 0
Cornelius, Whitstable.....	2,175 0 0
Shrubsole, Faversham.....	2,139 0 0
Stiff, Dover.....	2,112 0 0
Adams, Herne Bay.....	2,110 0 0
Joelyne, London.....	2,080 0 0
Amos & Ford, Whitstable.....	1,920 0 0

For a pair of semi-detached villas, Elmfield-road, Bromley, Kent, for Mr. J. Howard, Messrs. Beasley & Williams, architects, Buckingham street, Adelphi:—

Payne.....	21,867 0 0
Crosley.....	1,835 0 0
Pease.....	1,755 0 0
Arnold.....	1,720 0 0
Balding (accepted).....	1,667 0 0
Williams.....	1,588 0 0
Lay.....	1,552 0 0

For the erection of stabling at Cricklewood, for the London General Omnibus Company, under the supervision of Mr. G. T. Lanham, Quantities by Mr. Bolton:—

Webb & Rosser.....	21,368 0 0
Evans & Co.....	1,233 0 0
Smith.....	1,229 0 0
Cheshire.....	1,228 8 11
J. R. Hunt.....	1,200 0 0
Allard.....	1,197 0 0
Hack.....	1,197 0 0
Priestley & Gurney.....	1,195 0 0
Parlier.....	1,175 0 0
Higgs.....	1,150 0 0
Havnes.....	1,150 0 0
Jackson & Todd.....	1,127 0 0
Aldridge & Fenry.....	1,125 0 0
Richens & Mount.....	1,112 0 0
Garrud.....	1,083 0 0
Scharien & Williams.....	1,054 0 0

For new shop-front and alterations at No. 24, Chapel-street, Edgware-road, for Mr. T. Correll, Mr. Frank J. Ruddle, 85, St. Martin's-lane, architect. Quantities supplied:—

F. Mark.....	2,363 0 0
W. Langridge & Sons.....	325 0 0
W. E. Eyvess.....	293 0 0

* Accepted, subject to modifications.

For building Raleigh House, Bromley, Kent, for Mr. J. Curtis, Mr. P. Stocker, architect:—

T. W. Harriman, Lewisham (accepted) £1,735 0 0

For Hendon Main Drainage Works, Mr. John Pollard, C.E., engineer:—

Ford & Everett, Clayton Works, Kennington-road (accepted) £31,000 0 0

For alterations and repairs to Portland House and Portland Villa, Horseay-lane, for Mr. S. W. Francis, Mr. Walter Graves, architect:—

Williams & Son.....	2,419 0 0
J. Lewis.....	377 0 0
Mastock Bros.....	335 0 0
W. Ebbinge.....	298 0 0
Ward & Lomble.....	282 0 0
J. O. Richardson (accepted).....	233 15 0

Accepted for restoration of premises, No. 25, Ivy-lane, after fire, for Mr. Jones, Mr. William Smith, architect:—

Larke & Son..... £243 6 0

[No competition]

For alterations and additions to the Commercial Tavern, Battersea Park-road, for Messrs. J. Carter Wood & Co., the Artillery Brewery, Victoria-street, Westminster, Mr. John Calder, architect. Quantities by Mr. Edward Crutchlow, Albert Chambers, Victoria-street, Westminster:—

Gregory.....	1,675 0 0
Axford.....	1,625 0 0
Falkner.....	1,595 0 0
Boyle.....	1,530 0 0
King & Sons.....	1,420 0 0
Stilling.....	1,340 15 0
Stephens (accepted).....	1,195 0 0

For the erection of cement kilns for the Rainham Portland Cement Company, Limited, Rainham, Essex.

Mr. Rymer Jones, Engineer:—	
H. L. Holloway, New Cross Gate.....	21,587 0 0
Bartlett Bros., Witney, Oxon.....	1,650 0 0
Perry & Co., Bow.....	1,490 0 0
B. S. Cooke & Co., Balfour, Essex.....	1,460 0 0
G. Gates, Rochester.....	1,370 0 0

For building house and stables for Mr. H. Allen, in Chequers Close, Basingstoke. Messrs. H. B. Kynard & Sons, Basingstoke, architects. Quantities by the architect:—

J. Grace, Stockbridge.....	22,233 8 11
E. J. Batten, Everton.....	2,058 0 0
H. J. Goodall, Basingstoke.....	1,978 15 0
W. Musselwhite, Basingstoke.....	1,919 0 0
Kent & Lunn, Basingstoke.....	1,815 15 8
J. A. Sims, Basingstoke (accepted).....	1,900 0 0

For additions to Upper Hasldon Schools, for Mr. Charles Morrison, Messrs. Gordon & Lowther, architects, Basinghall-street, E.C.:—

Steel Bros.....	2,698 0 0
Higgs, Reading.....	579 0 0
Richardson, London.....	578 0 0
Potter, London.....	550 0 0
Bottrill, Reading (accepted).....	610 0 0

Shops, Stables, &c., Camberwell.—Messrs. James Smith & Sons, builders, Norwood Junction, write to say that their tender was omitted from the list of tenders (published on p. 564 of last week's Builder) for four shops, and not a shop, for the London and South-Western Bank, Church-street, Camberwell. The amount of their tender was 11,927l.

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at the office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

D. A. (the publication of which you send notice is out of the proper scope of our announcements).—P. J. B.—R. S.—E. T.—A. B. We have the publication of your letter would hardly benefit you; the change which you note is part of the way the world goes, and not a peculiar addition of your trade.—T. C. H.—W. M. M. (by initials over concrete floor, with cross-hatching laid on the concrete to keep the joints clear of it; it will have the same "wading" in the other floor then, and can be either boarded or finished with parquetry on rough boarding. Parquetry runs from about 2s. 6d. per foot super, according to elaboration of design and quality of wood.—W. H. S. E.—Damp Stone Walls we do not profess to give addresses. See below.—[at the Solicitor General's Company noted.] A liquid for application to exterior of stone walls, and other applications are from time to time advertised in our columns. As to lands, it is difficult to say what will keep down out of the ground. It is in the wall. In all such cases advice can only be satisfactorily given after personal inspection of the special circumstances, and it is better in the party wall, as reference to the plan would make evident.—D. B. amounts should be sent.

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Notes.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications beyond mere news-items which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

PERSONS Advertising in "The Builder," may have Letters addressed to the Office, 46, Catherine-street, Covent-garden, W.C. free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied direct from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum, payable in advance. To countries within the Postal Union, 25s. per annum. Remittances payable to DOUGLAS FOURDRINER, Publisher, 46, Catherine-street, W.C.

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* Stamps must not be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to DOUGLAS FOURDRINER, Publisher.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

Best Bath Stone.

WESTWOOD GROUND, Box Ground, Combe Down, Corsham Down, And Farleigh Down.

RANDELL, SAUNDERS, & CO., Limited, Corsham, Wilts. [ADVT.]

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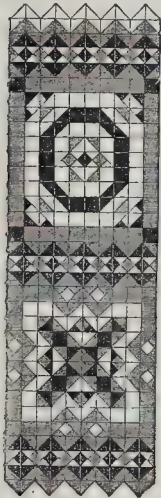
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The London Government Bill.

N the whole it may fairly be said that Sir William Harcourt's Bill for the better government of London has met with a favourable reception. It would have been absurd to suppose that a Bill with the object of systematising the government of London could have been introduced without meeting with some opposition, especially from the City authorities. But in the main the opposition to the present Bill is distinctly feeble, nor could it very well be otherwise.

wise when so many persons, Conservatives and non-politicians as well as Liberals, have for years been saying that something must be done to improve the government of London.

It may be that a Bill of the intricacy and importance of this London Municipality Bill will not become law this year, but the opponents of the measure need not, therefore, flatter themselves that the measure is dead; for many useful Acts have taken more than one session to struggle into birth. It must also be borne in mind that Conservatives in the House of Commons, who represent large provincial boroughs, can be but very lukewarm opponents of such a measure as this. Thus the Conservative members for towns such as Liverpool, Manchester, and Sheffield, too well appreciate the value of genuine local self-government to be able to do much to hinder the progress of Sir William Harcourt's measure.

The essential and cardinal features of the Bill are the creation in London of one single municipality, and the establishment of District Councils, which are dealt with by the sixth section. When it is observed that by the fourth clause of the Bill no less than eight different jurisdictions will be taken over by the new corporation, and if we include the existing Corporation of the City of London, and the City authorities, several other jurisdictions, the necessity for a consolidation of our present governing powers is obvious on the face of the Bill itself. Of this consolidation, then, of the existing bodies of the metropolis, we thoroughly approve, but we have

considerable doubts as to the wisdom of creating District Councils. The District Council is to consist of the Common Councillors elected for the particular district as its representatives on the Common or Central Council, and also of a number of District Councillors. To this District Council is to be assigned by the Central Council "the exercise and performance of such of the powers and duties of the Corporation of London (except the power to raise money by rate, loan, or otherwise) as the Common Council, on account of the local character of the powers and duties or on account of local or other special circumstances, think can be more advantageously exercised or performed by a local body." But there seems to be no little danger that either the District Council will be so weak that it will do such work as may be assigned to it very badly, or it will be so strong as to do work which would more properly be done by the Common Council. We believe that the first is the most probable result, because there can be no doubt that the best local representatives will form part of the Common Council, and though they are also to form part of the District Council, yet it is quite probable their views may be overborne by those of the District Councillors proper; and, further, if the Common Council has so much work to transact that it delegates some part of its functions to the District Councils, then it is highly probable that the District Council proper will have its own way with the work which it takes in hand. We can see no reason why, if the Common Council is sufficiently large, committees of it should not be able to cope with all the various details of work without delegating any part of its functions to a District Council, which is certain to be the scapegoat for any mistakes with which it can be saddled. It is said that London is such an enormous town that it will be difficult for the Common Council to transact all the business of the metropolis. But, after all, if one Council can rule Glasgow, and Manchester, and Liverpool, and Birmingham, it does not appear why one Council should not equally well rule London. It must also be borne in mind that whilst District Councils will do but little to encourage local interests which would not be better done through the influence of the Common Council, it will be easy for them to perpetuate the differences and the distinctions to which it is the object of the Bill to put an end. Having adopted, and necessarily adopted, the scheme of a single corporation, we have no doubt that it would be much better that Sir William Harcourt should not flinch from carrying out the principle to the full. If he does this he will not attempt to perpetuate the worst

features of the existing Vestries in the new District Councils.

We may pass over the part of the Bill which deals with the judicial arrangement of the new Corporation, though we may observe *en passant* that, however conscientious may be the present City magistrates, there can be no question that it will be far more satisfactory to have the judicial work of the City done by stipendiary magistrates than by the combined efforts of amateur justices and a professional clerk, however skilled he may be in his duties.

The next point to note in the Bill is the appointment of a Deputy Mayor, who is to be a paid officer. The proposal appears to us to be unwise. We fail to see the necessity for such an official, or why the councillor next in seniority to the Lord Mayor should not act for him when necessary. We have spoken of the Chief Clerk at the Mansion House; to have, so to speak, an amateur and a professional Lord Mayor seems to be likely to take away largely from the authority of the nominal chief of the Corporation, and to vest the chief power in an official who will be paid for the work he has to do.

The Bill before us is far too large for us to do more than note some of its chief provisions; our space is wholly inadequate to criticise each part and each detail of this important measure. We may next, however, note that the Assessment Committee for each parish shall in future be nominated by the Guardians of each parish; that the Court of General Assessment Sessions shall be formed by the Recorder, or one of the Deputy Recorders, as chairman, and of such chairmen of the district councils, not exceeding six in number, as the Common Council may from time to time select. It may be doubted if this will be a sufficiently strong court to deal with the important cases of Metropolitan rating. We should have preferred to see the Court consist of more lawyers and of lay members selected by the Common Council for their efficiency in regard to this particular question. It by no means follows that the respective chairmen of the District Councils will be the persons most fitted to adjudicate on these matters. Moreover, we should hesitate to give more influence to the District Councils, if they are to be, than is possible, even though the chairman of each council should necessarily be one of the Common Council. Not a little of the Bill is concerned with arrangements as to the administration of justice. These seem to be worthy of approval, and we do not propose to add to our criticisms on the Bill by remarks on them.

A very important provision is contained in part of the forty-eighth section, which runs as follows:—"The Common Council of London

shall, so soon as may be, submit to Parliament Bills for the following purposes:—(a) 'To obtain the authority of the Secretary of State over hackney and stage carriages'; (b) 'for the purchase or regulation of the undertakings at present supplying respectively water and gas to any part of London, or any of them, or for the permission of a new supply of water, gas, or light to London or any part thereof.' This clause we consider very proper and very essential, because it would be absurd to create a great metropolitan corporation and not bind it to undertake the supply of water and light to the city which it ruled. It may be said it would do so as a matter of course, but equally as a matter of course the adherents of the existing leading corporation would endeavour to make it take as long to do as possible. If this clause (indeed, we would word it somewhat more stringently) becomes law, practically the first great work of the new corporation will be to take over the present gas and water companies of the metropolis. Among other duties of the new corporation will be that of being the burial board for the whole metropolis, an authority of the highest importance from the point of view of the public health.

We have in the preceding remarks touched on some few of the most noticeable points of this Bill,—one which, there can be no question, does credit to the Government by which it is introduced. It effects its object with as small an amount of friction as is possible under the circumstances. It is clear, and, considering the great size of the subject, moderate in compass, consisting of seventy-three sections, which, after all, is no great number. No doubt it is capable of improvement in many of its details, but, if the principle of one corporation for the whole metropolis is granted, there then is no reason why the necessary amendments should not be made in Committee, or why, in spite of opposition, the Bill should not pass into law during the current Session. The fear that the new Corporation will be a huge London Parliament should prevent no one from supporting it. London is large, and its governing body must also be large, but to suppose that the diversified elements of London will cause it to be a danger to the Imperial Government simply because it possesses a corporation, is an idea unworthy of sensible men.

PRE-HISTORIC LONDON AND A NEW RAILWAY.

In its length of nearly 1,300 yards the new line of the joint Metropolitan and District Railways passes through "made ground," which represents a period of some 2,000 years and more. Nearly the whole of that ground had remained unbroken until recent years, whilst this last portion of the undertaking has laid bare, and for the first time, the actual soil of a British, certainly of a Roman, London. For in its course towards the Minories from the Mansion House Station the railway traverses two elevations, separated by the little Wallbrook flowing from the fens beyond Moorfields, whereof that to the east constituted the Celtic fastness of Kaswallon, whilst the other, protected by its steep descent to the Fleet, became part of the Augusta of a Roman age. Where necessary, foundations for the side walls have been carried down through the gravel for an extra depth of about 35 ft., to rest upon the blue clay beneath. In constructing these foundations numerous evidences were found in favour of received opinions as to the nature of the soil over which London first began to arise. For instance, in Dowgate-hill an ancient landing-stage came to light. This is a Roman pavement, in tile, set upon timber piles, with mortised jointing. Near were certain oaken beams, considered to be of somewhat later date. The landing-stage is in every way superior to that which was discovered in Trinity Square-gardens. It is noteworthy to be observed that the stage stood upon the left bank of the Wallbrook, facing not the river, but the brook. We thus see that here, at any rate, the Thames then flowed some-

what along its present channel.* But the existence of a wider shore close by is apparent from the circumstance that the excavations which have absorbed Cloak-lane immediately westwards had to be made, and with much difficulty, through quicksands and the beds of former pools. By Bush-lane, east of Dowgate-hill, the works cross what is taken for part of the former or original City wall. The other landing-stage stood upon the edge of a hollow, whose dip ran in a line parallel with the Thames; forming in all likelihood the haven to an estuary of the river rather than to the river itself. A concrete bed supported the red tessellated pavement, and that again rested upon oaken piling mixed with oak-tree roots, these last being indicative of a preliminary clearance of the ground. This district, indeed, proved to be singularly rich with relics, comprising pottery both Roman and Mediæval, cannon-balls, glass, china-ware, with the like. Of these "finds," two leaden coffins may now be seen at the British Museum. One, though greatly damaged in an attempt to steal it, retains much of its original ornamentation, figured after the Roman fashion of pecten or scallop-shell with beaded band. In Seething-lane were found the arms of a bronze Roman statue of heroic size, singularly perfect; together with coins of Nero and of Vespasian. To the south of Aldgate High-street, at the bottom of a well 25 ft. beneath the surface, lay the windlass and a broken earthenware pitcher or pot. At the bottom of another well in that same street the workmen came upon an entire skeleton, its head downwards. They found another skeleton in precisely the same position, close to the tessellated floor in Trinity-square. Here, too, a large piece of the old London-wall had to be removed from between the Crescent and Trinity-mews. Many of the tiles carried impresses in various kinds of the maker's hand, whilst one bore a distinct print of the foot of a dog or a wolf, which must have run over a Roman brickfield generations ago. Human bones, including a skull of an early British as opposed to a Roman type, were scattered about within the wall; in the ditch beyond,—which was filled up in King Charles I.'s reign,—there lay heaps of the horns of cattle. The skull is a very interesting object; it lay at a great depth, in the clay; and has been examined at the College of Physicians.†

Scarcely less interesting is it to consider the changes which have passed over this portion of the town within a period not so remote. The existing Mansion House Station lies southwest of the intersection of Cannon and Queen Victoria streets, over against Bow-lane. To extend the former westwards from Budge-row (the ancient Watling-street) were obliterated Castle and Tower Royal Courts, Little St. Thomas Apostle's, Basing-lane, Little Friday-street, and Great Distaff-lane. From a map of Queen Elizabeth's time Little Friday-street, towards Carter-lane, appears to have been substituted for the name Basing-alley. With these fell Gerrard's Hall (on the southern side of Basing-lane), whereof the giant's effigy is preserved in the Guildhall museum. Little enough is left of Tower Royal, in the parish of St. Thomas Apostle, the origin of whose name cannot be satisfactorily determined. Both Stow and Strype derive it from an ancient palace here of King Stephen, though it appears that Queen Philippa, who used it for her wardrobe, is the first sovereign who can with any certainty be said to have occupied it.‡ Known at that time as "la Real," "la Riale," or "la Ryal," the inn and appurtenances were subsequently granted (1370), as of 20l. yearly value, to the canons of St. Stephen's, Westminster. Reverting to the Crown, it was styled the Queen's Wardrobe temp. Richard II. Joan of Kent fled hither for refuge from Wat Tyler and his followers, and here her son

lodge Leon III. when expelled from Armenia by the Turks. King Richard III.'s ledger-book contains an entry of his grant hereof to Sir John Howard, created Duke of Norfolk, the 28th of June, 1483. In Stow's time it served for the king's stabling; the wardrobe having been removed to Sir John Beauchamp's house in Blackfriars. The house which took its place after the Fire being pulled down about thirty years since, proved to cover the remains of a Roman villa. Similar havoc is due to Queen Victoria-street, which only just spares Wren's College of Heralds, formerly Derby House, with his churches of St. Andrew-by-the-Wardrobe, St. Nicholas Cole (or Cold) Abbey, and St. Mary Aldermary. But St. Mary Magdalene Church, rebuilt by Wren; the graveyard of St. Mary Mounthaw, as also Fish-street and Labour-in-Vain Hill, with most of Great Trinity-lane and St. Thomas Apostle's, have alike disappeared; the quaint old thoroughfares which ran down the incline to Upper Thames-street are altered well-nigh out of all remembrance.* For the site of St. Thomas the Apostle's Church (not rebuilt after the Fire) in Vintry Ward, we must now look in the lower part of Queen-street, as extended from the former Soper-lane. That is so-called says Stow, "not of soap-making as some have supposed, but of Alen le Soper in the ninth of Edward II." In this parish lived Gerard Johnson, a Dutchman, who made the monument and bust of Shakespeare at Stratford-upon-Avon. The old graveyard, its contents lately deposited in a vault, lay to the northeast of the intersection of Queen-street and what was St. Thomas Apostle. Together with Cloak-lane, the new line occasions the demolition of Cutlers' Hall, and the disturbance of the churchyard of St. John the Baptist, at the curve northwards to below the forecourt of Cannon-street terminus (South-Eastern Railway). At Dowgate-hill it traverses the now-dried-up bed of the Wallbrook. The adjacent sewer, carrying the diverted stream, is rebuilt at a depressed level so as to pass beneath the railroad. At this spot, owing to the configuration of the ground, there is so little of headway that the brick arch is replaced with iron girders for upholding the carriage-way above. Thence beneath Cannon-street, past the three successive sites of London-stone and that of St. Martin's Orgar, the line goes on under King William IV.'s statue (site of Boar's Head Tavern, Eastcheap), into Pudding-lane, where it encroaches on another ancient churchyard,—that of St. Leonard, Eastcheap. Its course beneath the southern side of Eastcheap and the northern side of Great Tower-street is plainly distinguishable by the corresponding removal of the premises above. At this moment a fine prospect offers to one looking down the widened thoroughfare from Gracechurch-street corner. Hence may be seen for a while, until the rebuilding is finished, a group of Wren's handiwork, exhibiting choice examples of his varied styles. In the foreground stand prominently aloft the Monument; the simple, yet withal elegant, tower of St. George, Botolph-lane; the beautiful composition of tower, cupola, and lantern which crown St. Magnus. Further are St. Mary-at-Hill (renowned for its interior) deprived, however, of its former stone tower; and the Classic-Gothic tower, with a high leaden spire, of St. Margaret Pattens. Behind these rises the almost unique steeple, in stone, of St. Dunstan-in-the-East, distance veiling the incongruous Gothic details of its pleasing, unwonted design. Monument-yard falls with the general clearance, and together with it the house of one Jacob, whereat Oliver Goldsmith first lodged as an apothecary's assistant on first settling in London. In constructing the ventilator at the junction on Tower Hill were discovered remains of the scaffold whereon Lord Lovat was not only the last to be executed, but the last to suffer death by decapitation in this country. The ventilator stands just by the scaffold; immediately opposite is No. 14 in the square, distinguished, like to No. 13, by the

* At Sir John Soane's enlargement of the Bank of England the brook's course was found embanked by wooden piles. St. Mary's Botlaw (site of the Cannon-street terminus) derived its name from a neighboring yard on the brook where boats were built.

† Some of these particulars are obligingly communicated to us by Mr. Warcham, of the contractor's staff.

‡ See the Wardrobe Account of the 6th of her reign, Cottonian MSS., Galba, E. III., fol. 177 et seq.

* Bennet's, Peter's, Lambeth, and Bread-street hills, with Fye Foot, Huggin, and Little Trinity lanes.

sign of the Mercers' Company, being the house in which the Jacobite "rebel lords" were lodged on the eve of their execution.

The current year's views of the Society for Photographing Relics of Old London, by the care of Mr. Alfred Marks, opportunely portray a few interesting features of the locality we describe. These (which have already been referred to in a previous number) are one of the two grand old doorways in College Hill, by the ruins of Cutlers' Hall, which have much the air of Wren's designing; two carved shell doorways (1703) on Laurence Pountney-hill; the Innholders' Hall; and a unique group of College-hill (*antique* Elbow-lane), commemorative of Whittington's endowment of St. Spirit and St. Mary, with another of Wren's nine stone steeples in the background, — that of St. Michael, Paternoster Royal, on College-hill. This church had been rebuilt by Whittington; there he was buried, and there on two occasions his remains were taken up from their rest.

THE GROSVENOR GALLERY.

THIS will not be recorded as one of the great years of the Grosvenor Gallery; since, with much that is interesting, there is no work of paramount importance which rises above the general level and takes rank as one of those pictures which every one is bound to see. Mr. Watts, who has practically "made" more than one exhibition at the Grosvenor, is not at his strongest; nor, in his very different way, is Mr. Burne Jones. The large and very elaborate painting by the latter artist, "King Cophetua and the Beggar Maid," is unquestionably a superb piece of colour, displayed in the armour and trappings of the king, but the painting really tells no story; no one could possibly guess the subject; there is no relation of action or expression between the two principal figures, and the beggar-maid is a poor, lean, starved creature, for whom no king in his senses would ever have deserted his social platform. This is a curious example of the really prosaic feeling which underlies the would-be poetic painting of Mr. Burne Jones; a beggar-maid is a beggar-maid to him, and nothing more; whereas it was simply because the beggar-maid was a glorious creature that the king of the story forgot her birth in admiration of her beauty:—

"In robe and crown the king stopt down
To meet and greet her on her way;
'Tis no wonder,' said the lords,
'She is more beautiful than day.'"

So the story reads to a poet. The like weakness is shown in the "Wood Nymph" (104), a decorative tree with a sad decorative maiden engrafted in the centre of it. All the old keen life of Paganism is gone out of this washed-out apparition. The sight of a nymph was supposed in antique times to make men mad: "Have you seen a nymph?" was the question if a man was very outrageous in his behaviour; but this nymph will madden no one; she is very harmless and "decorative," a Greek idea with a mild second-hand Mediævalism breathed into it. Mr. Watts is represented by several works of comparatively small size, including two portraits of remarkably intensified and contrasted character,—those of Lord Salisbury and Lord Lytton. Without losing truthful likeness, both these are remarkable as portraits giving indication of character, of something more than the mere outside similitude; that of Lord Lytton,—a profile, leaning forward, chin on hand, with a dreamy and irresolute air,—is quite exceptional in this respect, and is an admirable study of character. The ideal female head and bust, called "Uldra," seems like a repetition of the head of the "Psyche" which was before in this gallery, reproduced in warmer colour and even more shadowy and vague execution; the ghost of a picture rather than a picture in the flesh. There is a remarkable luminous character about the painting, but it looks like an experiment in effect rather than anything of serious meaning.

At the south end of the large gallery a central position is occupied by a work which few at first sight would attribute to its author,

Mr. Calderon. This is a representation, rather in the spirit of Cabanel, of "Aphrodite" (38) born from, or borne upon, the sea waves. The goddess of beauty floats on her back on a billowy sea of very unreal tone, her long hair by the sweep of the water, her upturned face foreshortened. The quotation "fresh as the foam" gives the cue to the artist's aim, the representation of the warm glowing life of the delicate body in contrast to the cool sea; and it is a remarkable painting, one that would make its mark in any exhibition; but here, again, the poetry seems taken out of the legend; this is not,—

"Idalian Aphrodite beautiful";

not a goddess at all, in fact, but a sensuous-looking female buoyed somehow upon the waves. Another nude study at the end of the East Gallery is in a remarkable degree at once a comparison and a contrast to the last-named. This is Mrs. John Collier's work, entitled "By the tideless dolorous Midland Sea"; a nude figure prone among the sand-hills, another partially-draped seated with her head bowed on her hands. The picture looks as if it had been painted simply as a study, and the title invented afterwards; but while Mr. Calderon brings a poetic idea down to prose, Mrs. Collier goes far to raise a prosaic subject into poetry. The principal figure is really remarkable as a nude study, more especially in regard to the delicate combination of flesh tones with sand tones; but there is something more in it than this, and though the situation, story, and title are certainly not very intelligible, the work is full of expression; it is a painting that ought to raise Mrs. Collier a most decided step in artistic rank, as we believe painters will be the first to admit.

Among other figure pictures there are not many, apart from the portraits, which give us pause. Mr. Spencer Stanhope, Mr. Strudwick, and Miss Pickering play variations on the same string, which the first-named artist originally set going; doleful is their allegory and lanky are the figures through whose posturings it is told. Mr. Strudwick's illustration of the parable of "The Ten Virgins" (45) is a kind of thing which in conception strikes us as literally beneath contempt, or perhaps just fit to hang in a nursery as a "Bible picture" for children. Miss Pickering we expected better things of, from some of her former works in the Grosvenor Gallery and elsewhere; but she, too, has been drawn into the lanky sentimental style, though her painting suggested by a passage from Tibullus (176) is by no means so feeble in style, or so affected in drawing, as those of the other two sinners in the same condemnation. Mr. Albert Moore sends a remarkable study of a maiden swathed closely in a *crêtonne* drapery, reclining on a couch (158); the picture, of which a smaller repetition is in the Society of Water-Colourists Exhibition, is like most of Mr. Moore's, perfectly expressionless, but then it pretends to be nothing else; it is professedly decorative painting, and it is faultless within its own limits. Mr. Reid's "Rival Grandfathers" (35) represents a group of figures in the foreground of the same fishing town which formed the scene of one of his last year's paintings; the picture has the merits of fidelity in representation of rustic character which belong to the artist, but it is not one of his happiest efforts. Mrs. Alma Tadema has made an advance in *technique* on anything of hers we have previously seen, in her two small works (18 and 19); in the former of which, "A Birthday," the influence of her husband's teaching is very evident.

Amongst the portraits one of the finest is, undoubtedly, Mr. Millais's "Marquis of Lorne" (106), a half-length in furled robes, a realistic portrait of most masculine force and power. The same artist's "Lady Campbell" (62) is an effective portrait, but not in his best manner. Among the portraits which are downright portraits, in which the likeness is the chief consideration, Mr. Herkomer is very strong; his portraits of Canon Furze and Lord Brabourne (70 and 79) are masterly specimens of clear incisive painting of character and ex-

pression in the features. Mr. Frank Holl's portrait of Mr. James Spicer (33) has the same kind of excellence, but seems to want "bringing up" in the accessories and costume a little more; the face and hands form at present three light spots in the midst of an expanse of very dark canvas. There is no finer bit of flesh-painting in the exhibition than Mr. Tadema's "Miss Lewis" (15); his two portraits of Signor Amendola (8) and Herr Lowenstam (143) are effective, not without a suspicion of *chic*. Mr. Whistler's "Lady Archibald Campbell" (150) is truly original; the lady is caught in the action of turning away to walk off, casting a Parthian glance behind her so as to show nearly her profile face; odd as it is, one cannot deny its effectiveness, in a sense. Mr. W. B. Richmond's portraits of Miss Dora Mirlees and Miss Rose Mirlees (76, 81) are examples of the class of very consciously arrayed and contrived effects in portraiture which he aims at, and which, in spite of fine colour, seem too artificial and self-conscious to satisfy the best taste in portraiture. Mr. John Collier's "Mrs. George Peck" (95) is an admirable and most refined work, somewhat odd in colour (see, for instance, the tone of the hands), and Mr. Hanson Walker's "Dorothy" (166), which seems to be a child-portrait, is very good.

Among landscapes (of which there are not many to speak of), Mr. Alfred Parsons sends a beautiful work, "Meadows by the Avon," and Mr. W. S. Jay, whose name is not familiar to us, a fine and powerful wooded scene, "At the Fall of the Leaf" (52), remarkably truthful in effect. Among the sculpture exhibits there is a rather alarming figure by Mr. R. B. Browning, "Dryope fascinated by Apollo in the form of a Serpent." Dryope is a formidable-looking nymph indeed, with legs like those of a cart-horse, and wonderfully modelled body generally. There is some power in the expression of the head and the action as seen from the left of the figure, but the author would have done wiser to have accepted the verdict given in "another place," where it is understood to have been declined. Mr. Browning is trying to do everything, and exhibits a not very good landscape (12) and a very grotesque statue. He would do better to concentrate. His bust illustrating some lines from his father's poem, "Pictor Ignotus," is fine and expressive; on the other hand, his bust of "Pompilia" is a libel on that exquisite creation, and one wonders how Mr. Browning the poet "allowed it." Mr. Mullins's marble statuette, entitled "Memories," is a beautiful and refined little work; and Count Gleichen exhibits a striking bust portrait (*terra cotta*) of Miss Mary Anderson.

NOTES.

We had not the slightest expectation that Dr. Cameron's "Disposal of the Dead (Regulation) Bill" as it is termed, the second reading of which was taken on Wednesday evening, would pass this Session; and on the whole the support of a minority of 79, as against a majority of 149, was a better record in its favour than might have been expected, considering the phalanx of prejudices which has to be faced in regard to such a proposal. Those who read dispassionately the speeches of the two eminent medical supporters of the Bill, Dr. Cameron and Dr. Farquharson, and the reply of the Home Secretary, will probably come to the conclusion that most of the reasoning in the matter is on one side and the prejudice on the other; in fact, the Home Secretary scarcely disguised the fact that he opposed the Bill out of pure sentiment; he does not like the idea of cremation, and thinks that other people ought not to like it either. This would be intelligible if the Bill were one to enforce cremation; but as all the promoters of the Bill ask is that the system, being favoured by an increasing number of persons, and backed by the support of eminent medical men, should be recognised by Government and taken under Government regulation and licence, the opposition to so moderate and reasonable a demand on the part of the Home Secretary

seems to us exceedingly illogical. That the rank and file of the House would vote on the Bill at present was to be expected; but one hoped for more reasonable counsels at headquarters; and when Sir William Harcourt said he knew he should be regarded as a Philistine for his remarks, we can only concur with him. Mr. Labouchere was amusing (perhaps a little "out of season") in his attack upon the objectors to the Bill, and other members were amusing without knowing it; the pathetic protest of a certain well-known member, in favour of his body being laid in the ground till the Resurrection, recalls Burns's congratulations to a country squire on the promise that the body as well as the soul should rise,—

"For had He said, 'The soul alone
From death I will deliver,'
Alas, alas! O Cardones,
Then thou hadst slept for ever!"

We print, as the *Builder* has done for a long time past, the annual report of the Art-Union of London, and the speech of Mr. G. Godwin, the chairman, in moving the adoption of the report. Mr. Godwin, it will be observed, alludes to the fact that the support given to engraving by the Art-Union has not been recognised as it might have been, and complains that "many estimable gentlemen abuse the Art-Union who have not seen half a dozen of the works it has produced." If we may assume for a moment to speak on behalf of these "estimable gentlemen," we believe the feeling is this, that some of the large engravings which have been put prominently forward as the boon of the Art-Union to the public, though they have had an immense circulation, and been welcomed by thousands, have not been of quite the most refined quality of engraving (some of them have been over-large and rather coarse in execution), and that they have represented works, such as the "Death of Nelson," which was alluded to by Mr. Godwin, which appeal rather to the feelings of general interest in a patriotic subject than to artistic culture in the higher sense. The answer to this very likely will be that what the people,—the "lower middle class," for whom cheap art is a *desideratum*,—especially want, is a picture appealing to their patriotic or their domestic sympathies, showing them something within the range of their every-day feeling or experience. That is a position, that may be reasonably maintained, of course; but some of us have a feeling that we would like the middle and lower classes to enjoy art as we enjoy it, and that we do not wish to circulate among them works which we should not care much to hang on our own walls. We do not wish to see the dissemination of "popular" pictures, but of the best art as cultivated people regard it; and the Art-Union would do well, in the true interests of popularising art, to raise the character of its subjects, and reduce the size of its engravings.

The hanging committee of the *Salon* have taken a step little short of revolutionary. They have rejected a picture on grounds of public decorum! The work was one by M. Jules Garnier, entitled "Borgia s'amuse," and illustrated one of the favourite recreations of that *spirituel* person, as described by an Italian chronicler. The arrangement was that certain dancers, having executed dances before Borgia and *suite* in costume, continued the display in *puris naturalibus*. It was (of course) this latter section of the "function" which the discreet artist undertook to realise. But, say the Committee, the picture of seven naked women dancing is not fitting for a place to which ladies and children come, and will shock their sense of propriety. We regard with satisfaction the fact that a *Salon* Committee have recognised the existence of a sense of propriety which people have sometimes been inclined to think they ignored. But they put their refusal on the wrong grounds, and gave the painter the excuse for retaliating, with some effect, that many more nudités had been admitted before. Had the painting represented nymphs or other innocent

beings, as Spenser saw them in the "Faerie Queene,"—

"All ranged in a ring, and dauncing in delite,"

most of us would think very differently of the matter. But the artist seems to have deliberately chosen a scene of lascivious and indecent revelry (some part of the original description of the scene, if we remember rightly, is unquotable), disgraceful to all who engaged in it. It is sufficient for the interests of historical truth that we should know, as we do, what kind of lewdnesses disported themselves behind the polished mask of Renaissance Society; it is not necessary nor conducive to public morality to endeavour to realise them in painting; though it must be admitted that our neighbours have been a good while in finding this out.

The *Courrier de l'Art* gives a list of art exhibitions to be held in France during the summer and autumn of this year. Commencing with the "Salon," open from May 1 to June 20, we have next in importance the exhibition of decorative arts by the "Union Centrale," about which we have already spoken, from August 1 to November 21. The exhibition of the "Société des Amis des Arts de la Somme" will be held at Amiens from June 1 to July 20. Beaumont has its exhibition of "Beaux Arts, de l'Histoire et des Arts qui s'y rattachent," from May 15 to July 16. At Carcassonne is to be an exhibition of art, archaeology, and artistic photography, from May 24 to June 30. At Nancy, the twenty-fifth exhibition of the "Société Lorraine des Amis des Arts" will be open from May 20 to July 1. Orleans announces a fine-art exhibition from May 17 to July 1; St. Omer a similar exhibition from the 1st to the 30th of June; Tours, an exhibition of decorative art from June 1 to July 1; and La Haye (Pays-Bas) a fine-art exhibition from May 15 to June 29.

We have received from the Fine Art Society a small book, giving the history, so to speak, of Sir F. Leighton's picture of this year, "Cymon and Iphigenia," with facsimiles of various studies made for the principal figures (some of them modelled in the round), the drapery, the hands, and the foliage of the trees. It is rather a question whether this is a wise precedent. If it is followed too often (and followed to some extent it is certain to be) we shall be apt to be rather embarrassed with a volume for each picture of note; and this taking the spectator behind the scenes into the studio, perhaps, tends to exercise a disenchanting effect in regard to the pure enjoyment of the work as a painted poem. It is exceedingly significant, however, of the serious interest now taken in art, that it should be worth while, commercially, to bring out a booklet giving the whole process of the making of one picture, and the various stages of elaboration of separate figures. Ten or fifteen years ago there would hardly have been a public for such a work. Now it may, perhaps, have an educational influence on some, who may learn from it with what labour a picture is made, a matter of which so many good people have so limited an idea. Still, we deprecate the introduction of a special class of literature of this kind, and we doubt if the artists will be wise to encourage it. The actor should be judged on the scenes, not behind them.

SIR JAMES PICTON contributes to *Notes and Queries* of last week an interesting letter on the word *ogive*, adopted into our architectural language in the form of "ogee," though with a different meaning; "ogee" referring merely to the shape of an arch or a moulding-section, whereas *ogive* and *ogival* in modern French usage refer rather to general character, and are even frequently used as synonymous with "Gothic" in our architectural diction. Sir James Picton supports the view that "ogive" was originally derived from the Latin *augere*, to augment or increase, the word having been first found applied to the moulded ribs of the cross arches of a vault, which served to augment the apparent strength of the construction at the point where the original sharp angle at the

meeting of the vaulting surfaces left a sense of weakness. The word was then transferred in English to the character of the mouldings employed in the later groin-ribs. Sir James quotes from Quatremère de Quincy to the effect that "Les ogives dans les constructions gothiques ne sont rien autre que des arêtes saillantes, au lieu d'être des arêtes sans saillie."

From what we hear, there seems to be a tendency on the part of those who look after the architectural education of the students at the Royal Academy to break away from the tradition which has prevailed of giving students large ideal buildings to carry out, such as a national museum or a grand entrance-hall to a palace, and directing their attention to the artistic treatment of smaller and practical and everyday works. Thus, Mr. G. Aitchison, as visitor, has just given as a subject a "Roadside Railway Station," with a 12-ft. platform covered with glass next the railroad, and a covered way for carriages next the road, over which the station-master's residence may go if necessary: the main building not to exceed 55 ft. by 28 ft. in extent. When we think how seldom there is any attempt made to render stations of this kind architecturally picturesque or expressive, how complete a failure the attempt often is when it is made, and yet how much might be done with railway stations in this way, we cannot but consider this class of subject a most useful and interesting one for architectural students. They should specially try to make something better than usual out of the iron and glass roof: the "ornamental" ironwork of railway stations, large or small, being in general one of the most painful of the artist's travelling experiences.

THE Art Marble Engraving Company, in Warwick-street, Regent-street, have a process of engraving on marble to exhibit, which claims some attention. Instead of the costly process of engraving with tools a design reproduced from a cartoon, by this new process the artist draws with his own hand directly on the marble with an acid, which eats away the surface, leaving furrows, which are afterwards filled in with dark composition or colour, to bring out the design. The effect in the examples exhibited is good, and the artistic advantage of drawing directly upon the marble, without the interposition of a workman's tool between the hand of the artist and the final result, is in itself an important advantage, over and above the saving in time and labour.

At Mr. Mendoza's gallery in King-street St. James's, is a collection of pictures, including some works by well-known English artists, some by artists whose productions are not so generally familiar here. Among these, "A Venetian Wedding Party," by Favretto, is a powerful study of exterior effect, of shadow and reflection, in a strikingly original style of handling. One or two others by the same hand may be looked at, also an admirable little specimen of Mr. J. Clark's genius, "A Lesson in Cookery," and an exceptionally good river-side study by Mr. Wyllie. Two examples of Mr. Burne Jones, at widely different dates, serve to show how much advance he has made in some respects, and how extraordinary his technique and drawing once were. Some views in Egypt, by Mr. John Varley and the late C. Vacher, are worth attention; the style of the latter is well known; Mr. Varley's treatment of Eastern scenes and architecture is very powerful, a little like Pasini a good deal magnified, at least in composition and colours, though the texture is very different. A large and very clever work by Mr. Dendy Sadler, "An Angling Match on the Thames," is also to be seen; an intimation that Mr. Sadler does not mean to confine his attention to monastic scenes entirely, though he has made his success hitherto in those.

An exhibition of what has been entitled "endolith" work was opened at Piccadilly Hall this week; it represents a process invented by Dr. Hand-Smith, by means of which colour applied to the surface of marble, in

conjunction with certain chemicals, is induced to sink or eat its way into the marble without corroding or disturbing the surface. It thus becomes a painting imbedded in the marble to a certain depth (about the sixteenth to the eighth of an inch), and capable even of being polished over without disturbing the design in any way, and the inventor claims for it that it is as durable as sculpture or mosaic, as it ought to be if the results of the process are as described. Among the designs treated in this manner was a copy of the head of the principal figure in Mr. Poynter's as yet unexhibited cartoon for the dome of St. Paul's. The process has rather a hard effect; it might, we should surmise, be more satisfactory with less polish on the surface of the marble, but it certainly seems to possess special value as a means of imperishable painting, without some of the technical restrictions of mosaic.

A LETTER from a Bristol architect on the subject of the Institute, which we print elsewhere, embodies characteristically the kind of feeling, the absolute lack of *esprit de corps*, which renders it so difficult for the architectural profession to take the stand and gain the respect which we would wish to see it enjoy in this country. All our readers must be aware that we have never appeared as being especially supporters of the Institute of Architects; on the contrary, we fear we are considered to have often criticised them not very kindly. But we think it is well that there should be a professional representative body, and that, if so, it can only be made efficient and powerful by general support; and at this moment, more especially, there is a very well-intentioned and strenuous effort being made to render membership of the Institute in future a real test and assurance of sound professional knowledge. If, under these circumstances, the whole profession rallied round the Institute, and all the competent men became members, they would do more than anything else to put an end to the constant complaint of the employment of men who had no real claim to the title of architects, and who discredit the profession; and those who complain that the Institute is not doing all it ought for architecture should (as we have often said before) come in and do it themselves, instead of standing aloof and complaining. The feeling embodied in Mr. Pope's short letter is what prevents all this being done; and he would perhaps be surprised to hear that many people would regard the sentiments he expresses as somewhat selfish.

The important subject of "the French *diplôme d'architecte* and the German system of education," of course with a tacit reference to the possibility of reforming our own system of architectural education, will be discussed at the morning sitting of the Architectural Conference on Friday, the 9th. We desire to urge in advance that, so far as the subject is discussed in reference to reform in this country, the discussion should be confined to ways and means of giving diplomas for technical proficiency, not for artistic ability or genius. The latter cannot be gauged satisfactorily by any machinery of examination; and any attempt to do that will wreck the whole working of the idea of a professional diploma. Architecture is not purely an art, but an art and a business and scientific profession combined. It would be an excellent thing both for the profession and the public that technical proficiency on the part of those who profess to arrange the sanitation and construction of our dwellings should be formally and officially guaranteed. But artistic power cannot be measured; in architecture, as in other arts, it must appeal to a public verdict.

"Antiquities from Armenia."—In the article bearing this title in our last (p. 595), one or two errors occurred. The name of the town referred to is Van, not "Yau," as printed. In the thirty-first line from the beginning, for "uninscribed or ornamented" read "uninscribed and unornamented."

ARCHITECTURE AT THE ROYAL ACADEMY.

A GREAT many architects of the first rank are either represented in this year's exhibition or are represented by a single work, or by works of very moderate importance. Mr. Pearson sends nothing, which all must regret. Mr. Bodley, Mr. Jackson, and Mr. Basil Champneys have not found time to furnish illustrations of any of their excellent and attractive work. Mr. Edis sends but one drawing. Mr. Robson one, Mr. Colcutt one, Mr. Sedding one, Mr. G. G. Scott an interior of his fine church now building at Norwich, and that only; Mr. J. O. Scott sends nothing but a design for an organ-case; and Mr. H. W. Brewer, whose charming drawings are always looked for with eagerness, puts us off with a slight pencil sketch of the interior of his favourite Cathedral of Bois-le-Duc, a subject which his graceful pencil has often rendered for us. Mr. Brooks is represented by two of his characteristic ecclesiastical studies; and Mr. Waterhouse, though he has five drawings, has no work of any considerable size or importance. And yet the exhibition is of unusual interest, and affords examples of architecture which for design and draughtsmanship are, we think, above the average in point of merit.

Foremost amongst the examples of domestic work we must, without reserve, place Mr. Norman Shaw's "Dawpool, Cheshire," a noble design copiously illustrated by geometrical plans, elevations, and sections, and by some beautiful perspective interiors. Mr. Shaw has freed himself from many of the extravagances and blonishes which have offended certain purists in taste in many of his earlier works, and has succeeded in imparting to this his latest effort a breadth and serene dignity of treatment which is peculiarly his own,—unapproached and unapproachable by his numerous followers. These drawings bear the name of Mr. Lethaby, whose work we have more than once had occasion to commend, and we scarcely know whether to congratulate the designer in having so accomplished a translator of his work or the draughtsman in being furnished with such admirable designs for the exercise of his pencil.

While on the subject of draughtsmanship we must not forget to notice the very beautiful drawing, entitled "An Old Manor House," by Mr. Langham, or the two somewhat similar drawings of the "Guard-room, Mont St. Michel," and the "Château of the Gendarmerie, Caen," by E. I. Jackson; or, in another manner, but no less excellent in its way, Mr. Poley's "Design for a Staircase for a Royal Palace."

Messrs. Ernest George and Peto have sent two pictures, domestic architecture of a peculiarly picturesque and somewhat licentious type, drawn in the peculiarly effective, though slightly tricky, manner to which they have accustomed us. But any kind of draughtsmanship is preferable to the portentous ugliness of the style adopted by Messrs. Pugin & Pugin for their only exhibit, "The Old Palace, Mayfield, Sussex," or Mr. Crossland's amazing composition "The Holloway College Chapel."

The "Brick Tower, Albi Cathedral, France," by J. Attkow Slater, is a masterly sketch,—a tour de force in draughtsmanship, as is his sketch from Salisbury Cathedral,—as the quaint and strikingly original, "Front-door Gable, Collyers, Petersfield, Hants," by Messrs. Bateman and Keates, is in design.

It is difficult to account for Mr. Aitchison's allowing such a drawing as 1,242 to appear as his only architectural contribution,—a work in every way unworthy of him. Colour, even in the hands of so skilful a master of the brush as Mr. Waterhouse, is apt to be a little too loud. Whenever competent artists run riot with their palette the result does not compare favourably with the quiet charms of pen-and-ink or monotone studies, which are happily in vogue with architects. We thought that the days of foregrounds, in which ladies in green dresses and red stockings were being handed into Hansom cabs by flashy "swells," were past. Mr. Aston Webb's refined and artistic design for the new Bedford Club; and Mr. E. J. May, Mr. Sberriin's, and Mr. Ernest Newton's various domestic sketches contribute to the interest of a very interesting exhibition. The schemes for coloured decoration, and examples of stained glass are unusually numerous and excellent, and Mr. Grace's large and elaborate design for the decoration of St. Paul's must receive special attention in a subsequent notice.

Mr. Rowand Anderson's fine "Edinburgh

Medical School" is, unfortunately, "skied," and the same lot has befallen Mr. Leonard Stokes's broad and manly design for "An Academy of Arts." Both works deserved a better fate, while there are a few (very few this year) works which cannot be removed to too great a distance from the spectator.

On the whole the architecture is very creditably represented this year, and if the heads of the profession abstain from giving the public evidence of their superior skill in design, the omission is amply supplied by the younger men who are sometimes the equals in design, and the superiors in draughtsmanship, of those members of the profession who are occasionally credited with a monopoly of "all the talents."

We give these few remarks merely as preliminary to a more detailed examination of the principal drawings in future numbers.

THE INTERNATIONAL HEALTH EXHIBITION.

ALTHOUGH many exhibitors are well advanced in their preparations, many have as yet made no sign of activity, and it will require considerable energy on their part during the next week if all is to be ready for the opening ceremony on the 8th of May.

One of the most interesting features of the Exhibition will be a short, but what promises to be an exceedingly picturesque, street, representing bits of "Old London." The intention of this part of the Exhibition is to illustrate the manner in which our forefathers were housed, and the sanitary conditions under which they lived, and for this purpose it has been determined to faithfully represent and reproduce a number of typical buildings, of which authentic drawings have come down to us. The houses are built of timber, and plastered, in exact imitation of their prototypes, except that, for certain reasons, they are slightly, though proportionately, reduced in size. The houses are so grouped relatively to each other as to form a quaint and picturesque thoroughfare of the normal width of an old London street, the dates of the various buildings being as diversified as are their size and appearance, the object being to show a sort of sample of what the City of London was prior to the Great Fire of 1666,—the havoc wrought by that disaster being easy to understand in the midst of such buildings. It was at first proposed to represent a portion of Old Chesham, but apart from the doubtful authenticity of drawings and representations of some of the buildings in that street,—a circumstance which put this proposal out of court in view of the archaeological accuracy aimed at in these imitations of old buildings,—the site available for this portion of the Exhibition was only half the width of Old Chesham. This proposal was therefore abandoned, the actual street formed by the houses reproduced not being intended as the representation of any particular street of Old London (which would be impossible, as the originals of the houses copied did not stand adjacent to each other), but merely as a typical bit of Old London, the houses themselves, however, being, as before stated, actual reproductions. This street of old houses will be entered from opposite the Prince of Wales's Pavilion, in the Central Avenue of the Exhibition, through a reproduction in wood and plaster of one of the old City gates,—Bishopsgate,—slightly reduced in proportion, and flanked by the old City wall. The plaster-work is cleverly painted over to represent the masonry of the walls; even the Roman tiles are shown. The canopied niches and statues are in plaster; these and other portions of the gateway are covered here and there with lichens and weather-stains, and from the entrance to the Prince of Wales's Pavilion the illusion that the beholder is opposite a veritable Mediæval gateway is almost perfect. Entering the gateway the old houses reproduced on the left-hand side are the Rose Inn, Fenchurch-street; the Cock Tavern, Leadenhall-street; the Three Squirrels, Fleet-street (now Messrs. Gosling's bank); Isaac Walton's house, corner of Chancery-lane; and two old houses in Bishopsgate-street. Next to these comes a very good typical church tower, which differs only from that of All Hallows Staining in having a larger traceried window. Here the brush of the painter has done for the tower what it has done for the gateway, the weather-worn appearance of some of the quoins and

other stones being very well represented. Beyond this church tower is a portion of the Middle Row which stood in the Strand, just outside Temple Bar, and which, later known as the Butcher's-row, was swept away by the improvement made by Alderman Pickett. At this point of the old street is what is called "Elbow-lane," in consequence of a picturesque bend, necessitated by the contraction of the site at this point. Still keeping to the left we come to the Duke of Sully's house in the Middle-row, Strand, and next to two old houses in Bishops-gate-street and Goswell-street. Further on, some houses intended to represent examples in London Wall, Grub-street, King-street, Westminster, Little Tower-hill, and Warwick-lane, and, on the opposite side, a portion of the old London Wall, with its battlements, are at present in abeyance. The other building reproduced in the street include the entrance to the Priory of the Holy Trinity, Aldgate; the Fountain Inn, in the Minories; the Hall of the Brotherhood of the Holy Trinity, in Aldersgate-street; the house known as Sir Richard Whittington's Palace, in Hart-street, Crutched Friars, — a very rich example; two houses in Bankside, drawn by Mr. Gwilt before they were removed; and two houses in High-street, Borough. The cost of these buildings is being defrayed by the City Companies. They are being erected from drawings made by Mr. G. H. Birch, A.R.I.B.A., late Hon. Sec. of the London and Middlesex Archaeological Society, and under his superintendence. Messrs. Campbell, Smith, & Campbell, of 75, Newman-street, are carrying out the whole of the exterior painting and decorative works, as well as the leaded glazing.

Another very interesting portion of the Exhibition will be the Aquarium, which has been placed in charge of the National Fish Culture Association of Great Britain and Ireland, under whose auspices the excellent display of live fish and of the means of fish culture will certainly be one of the chief attractions of the Exhibition. This department will really be, in effect, a reminiscence of last year's "Fisheries Exhibition," its *locus standi* in the forthcoming show of course consisting in the fact that fish is an important and wholesome article of food, and that good food is essential to health. Mr. W. Oldham Chambers is the Secretary of the Association.

THE WATER-COLOUR EXHIBITIONS.

THE two "Royal" Water-Colour Exhibitions held their private view and their opening on the same day, as frequently heretofore; not a convenient arrangement for those who wish to see both. A new associate, Miss Forster, appears in the ranks of the "Society"; a landscape artist, whose best work, "Morning on the Seine" (197), is really exquisite, but an examination of the lady's other contributions leads to the conclusion that she is one of those artists who have discovered a special charm of effect and go on repeating it. We may suggest, by the way, that the Society should notify the names of new members in their catalogue each time there is an accession to their ranks.

The Society's exhibition is a very strong one. Something more special ought, however, to have been made of the works of their late highly-gifted member, Mrs. Angell, whose last executed drawing, "Chrysanthemums" (58), is exhibited, as well as some others, but only in a scattered and inconsequent manner. The exhibition affords interesting opportunities of comparison between the old and new schools, the latter being in force this year in the works of some of their leading members. Mr. G. A. Fripp, for instance, contributes a larger drawing than usual, "The West Coast of the Island of Sark" (23), an exceptionally fine example of the old clear, soft school of pure water-colour, which produced effects not imitable by any other handling or any other medium. We may contrast this with Mr. Hunt's exceptionally fine work, "A Deserted River-bed" (36), a work recalling Turner at his best, and which has all the force and depth of oil painting; a curious remark to have to make, as it is a constant complaint against Mr. Hunt by certain critics that his oil paintings are like water-colours. He shows his remarkable versatility, as usual, by a work equally fine in a totally different style and subject, "Cornfield, Warwick" (225), as well as several others, some of which are welcome repetitions, in miniature, of pre-

vious oil paintings. Mrs. Allingham is less fully represented than usual; among her two or three works, "Pat-a-cake" (238) is the best. Mr. Albert Goodwin distinguishes himself by several highly imaginative drawings, such as "Giant Despair finding the Pilgrims" (69), a work rather reminding one of Poole's suggestive combinations of figures and landscape; Mr. Goodwin's efforts, however, tend to become a little too artificial, a matter not of so much consequence in purely imaginary or romantic scenes; but his "Silence" (7), an evening scene of earthly landscape, is not nature as regards tone, it is a made effect, though a rich and fine one. Among drawings illustrative of architecture is a masterly one by Professor Ruckin, "Pier of the Porch, Duomo, Lucca" (153), confirming what we have long thought, that his greatest gift is as an architectural artist, and that if he had given himself more especially to that branch of art he would perhaps have done more for art than even by his writings. Mr. Glennie contributes some good views in the neighbourhood of Rome and elsewhere; and Mr. E. A. Waterlow treats a humbler branch of architecture admirably in his drawing of "The Old Post-office, Tintagel" (75). Among other works of special power and interest we note "A Dorsetshire Stream" (95), by Mr. Pilebury, showing less of the rather hard mannerism which has been a defect in some of his otherwise fine work; "Arcadia" (80), a beautiful bit of Surrey landscape, by Mr. Poynter, with an admirably drawn figure in the foreground; "Timon and Apemantus" (64), a powerful Titianesque landscape, by Sir John Gilbert; "After Rough Weather" (68), by Mr. Henry Moore; "The Fiery Palace of the East" (110), a sunrise effect at Westminster, by Mr. Herbert Marshall; also by the same artist, "London Bridge, with St. Magnus and the Monument" (83), and "At Hyde Park Corner, Looking West" (30), which, however, does not quite give the idea of the locality; "My Garden Hedge, My Orchard Fence" (33), a brilliant bit by Mr. J. W. North, rather spoiled by a bad figure; "Oats" (84), a charming landscape by Mr. Naffel, who has several other excellent works, and one or two in which he seems to have been trying experiments not altogether successful; and a brilliant bit of work by Mr. Tadema, "A Street Altar" (247). The exhibition, as a whole, is a remarkably good and interesting one.

The large collection of 1083 works in the rooms of the Royal Institute bears out what we have said from the first, that they were beginning a water-colour exhibition on too large a scale to keep the general quality of work as high as the position of the Institute ought to lead us to demand. There is a great amount of good work up to a certain level, but not much that rises above the level of average merit. Their gifted President restricts himself this year to a single beautifully-executed figure of a Puritan maiden, "Priscilla" (613), not less interesting for being a departure from his usual class of subject, but a second-class work for him. Mr. Arthur Severn contributes a fine view of "Edinburgh from the Nelson Monument" (28), and Mr. Walter Crane two ideal figures, beautiful in conception and colour, called "Evening" and "Morn" (86, 99), bringing into painting, if one may say so, something of the feeling which Shelley gives us in poetry. Mr. H. J. Stock's efforts in purely poetic and ideal figure subjects, such as "Love is stronger than Death" (93), are rather ambitious than successful. Mr. Ammonier's "On Harting Down" (189), and Mr. Wimper's "Llyn Pen Crag, North Wales" (218), are fine landscapes; and Mr. Joseph Nash strikes a tragic note in his "Satisfaction" (244), a single figure of a dead man, killed in a duel in a desolate nook among sandhills, and left there alone. Mr. Wyllie gives the fine title "Funeral March of a Hero" (406), to a fine drawing of an old three-decker hulk in tow of some tug-boats. "The New Forest from Lyminster" (427), is Mr. Collier's contribution, as to which the only criticism is that it does not quite convey the effect of the country. Mr. Charles Green's "Tom Pinch and Ruth" (468), is an admirable and delicate study of character, as true to the feeling of Dickens as possible, and executed to perfection. Mr. Palfrey has never done anything better than his garden scene, "The Graces" (596), the title derived from the three sculptured figures in the centre of the scene. This is a work of monumental power and force of execution, and one of the

finest things in the gallery. Mr. Abbey contributes an important work "A Bible Reading" (1,018). There are many other things of interest in the collection; few, however, equal to the few we have mentioned, and there are on the line some large works, some (we regret to say) by old members, which are simply vulgar. The catalogue is embellished by a large and excellent set of memorandum sketches of the principal works, or what are supposed to be so, some of which gain immensely in this sketchy black and white reproduction, with the crude and garish colouring omitted. The exhibition would be a finer one if it had been judiciously reduced in quantity by about one-half.

THE FINE-ART SECTION OF THE INTERNATIONAL EXHIBITION, CRYSTAL PALACE, 1884.

THE merry month of May is not the festive season of the professional critic. By way of preparation for heavier duties at Burlington House we must run through the galleries at Sydenham. 1,787 works are in the catalogue; and this number, in justice to the enterprise of the Commissioners, it must be said, falls far short of the actual fact. Many of the best pictures are uncatalogued and undescribed. It is time for an effective protest to be raised against the now common practice of opening large exhibitions before they are ready. This was done at the Fisheries' Exhibition; again, lately, at the Building Trades' Exhibition at the Agricultural Hall; and now again at the Crystal Palace. In more than one gallery, after over a week, there is still the profoundest confusion. The catalogue, besides that it is not complete, is a mass of misprints. In a few days, we are told, a new edition will be published. Meanwhile, the inconvenience is considerable.

The countries represented in this exhibition, besides our own, are Belgium, Germany, France, Italy, Holland, Denmark, Norway, and Sweden. There is always something instructive in the comparisons made possible by seeing the pictures of different nations hung side by side. Here, also, is much that is good, and much that under other conditions might be quietly enjoyed. It was not to be expected at this time that our own best painters should send their best works to the Crystal Palace. There are some good names in the list, however, and some good old friends amongst the pictures. First amongst these, a pleasant surprise, is Sir Frederick Leighton's "Psamathe," which we saw some four years ago at the Royal Academy. Nowhere better than in this picture do the special artistic and imaginative qualities of the President display themselves. It is only a woman (only the back of a woman, indeed) seated on the shore. She is uncovered, the pure white of her body projected against a blue wall which is sea. The waves, we are told, are not waves, and the flesh of the maiden is wax, but there is fine drawing, and loveliest form; there is delicate colour, and limitless occupation for wandering thought. It is a poet's picture.

Mr. Forbes Robertson sends his painting of the church scene in "Much ado about Nothing," in which he himself played a conspicuous part, and on which we commented before when the picture was in Bond-street.

Mr. Whistler sends nothing new, — a nocturn in blue and silver, and an awesome portrait, — "an arrangement in bronze and black."

A portrait of Miss Mary Anderson is catalogued, but, probably because of the carpentering operations, it eluded our search.

Frank Miles seems to develop into a really good painter. In Miss Ada Browning he has (or he is a wily flatterer) a very lovely subject. It is the face that suits him best, —

"If you get simple beauty, and ought else, . . .

You get about the best thing God invents."

The beauty is there, and the work, in its handling, is more like that of a painter than anything we have seen by the same artist. Mr. Mortimer L. Menpes is a painter in whom we delight; perhaps because, in his little pictures, he makes no loud call for applause. He is one of the group of Pont Aven painters, and has a touch of the infection of the Impressionists; but the impressions of Mr. Menpes are impressions of beauty, and are restrained, in point of size, within the limits proper to such work. No. 175, a "Young Artist," shows a child with a palette smeared with bright colours

sitting bathed in sunlight on the sands. This is a beautiful little painting. Amongst the sculpture may be seen a number of the now familiar works of George Tinworth, and several works published under the auspices of the Klypto-Ceramic Art Society.

A feature of this exhibition, which will be interesting to those not already familiar with it, is the *Graphic* collection. It consists of paintings in oil and water-colour, and black-and-white drawings supplied by various artists to the proprietors of the *Graphic*. Some now familiar paintings are in this room. "Out of Reach," by J. H. Calderon, R.A.; "Little Mrs. Gamp," a sort of companion to "Cherry Ripe," by J. E. Millais, R.A., and the somewhat silly "Type of Beauty," by G. D. Leslie, R.A. Mr. Leslie's "type" is, however, superior to Sir Frederick Leighton's (No. 716), which hangs upon the same wall. A touching picture is that by Mr. McWhirter (No. 723), "A Winter Grey." This represents a bare track of deep snow. One little twig remains uncovered, and a frozen-out robin, with a frozen-out hare for sole auditor, sings all he can. Amongst the water-colour and black-and-white drawings in the *Graphic* collection are many well-known and delightful things. Here, indeed, more than amongst the big pictures, we are impressed with a sense of the continuous vitality of contemporary art. There is no end to the abundance of it, and none to the call for it. The

painting of an undressed enormous woman; "A Young Genius" (No. 1,286), by Lacaze, represents a child in a painter's studio. This is a very clever and charming work by a temperate impressionist. Nos. 1,304, 1,305, are two wonderful town-scapes, by Legat. They have the adamantine look of a Canaletto or Guardi, but their sober colour is fresh and natural. They are flooded with light as an etching of Méryon. Bastien Lepage is represented by a good-sized work, No. 1,307 "Pauvre Fauvette," which has been seen already in London. More than one of the best pictures in this section is uncatalogued. One of these shows a girl lying, her face half shaded and towards you, upon the sand. There is sea beyond and sky above. The reverie of a beautiful woman must needs be of beautiful things. This is not a certitude of science, but a sublime necessity of art. The painter of it is T. Eugen Perrin. Our thanks are his.

We must pass many good and faithful small pictures of the modern Dutch school. "The Crocuses," by Miss Thérèse Schwartz, claims attention. It is of a woman, not young exactly, nor exceedingly beautiful. She has suffered somewhat, but is strong and can suffer more. We look, and we are not certain that the cloud may not in a moment be lifted. She may turn her head and find a smile, and become at once both young and lovely, a creature "bright and good," whose quest is the proper concern of

iron, and are hung to outside iron frames,—the inside of doors to fire being lined with fire-bricks set a little distance from the iron outside.

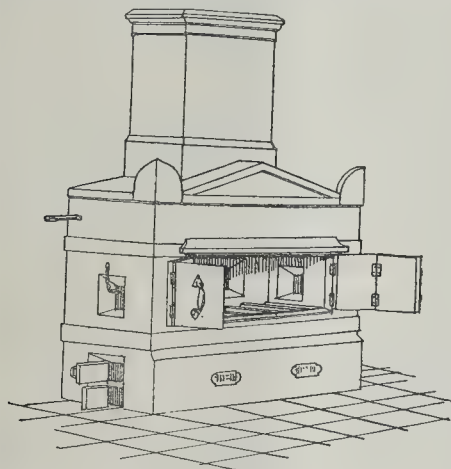
The folding-doors to cremating chamber are of fire-brick panels framed in iron, and are strongly hung to two heavy angle-iron bands which go round the building; over these doors, and bolted on to the top angle band, is a strong iron lintel for support of the structure over the doors.

The inspecting places at back and ends have iron outside frames, with fire-brick stoppers.

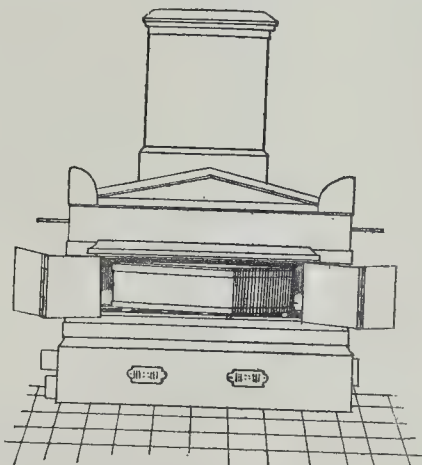
The roof over fire, and the bearers for coffin, are so constructed that the flames can come freely up from the fire without any risk of the falling through of the ashes of the subject cremated. Inlets are provided for the admission of thin streams of air to the smoke and gases, as they arise from the fire, so as to perfect the combustion, and generate heat as intensely as possible.

The roof of the cremating chamber is arched from front to back, and is provided with three dampers for regulating the heat,—these are of fire-bricks,—and over this arch a second is turned from end to end to support the chimney. The chamber between these arches is provided with a door at the back for clearing, &c., and a ventilator for the admission of air for the necessary combustion of the gases.

At the back of the cremating chamber are



Crematorium empty.



Crematorium with Coffin inserted.

picture, it seems, is to make way for the picture-book. Another noticeable thing is the large number of foreign artists who have found employment on this English paper. Not their number only, but, in general, their distinguished merit, as compared with their English fellow-workers. In some departments we hold our own. No foreigner competes in this collection with J. Charlton, in his many and delightful studies of the horse and his rider.

Three galleries are given up to the art of Germany. Here, and of the Munich School particularly, there is much both interesting and beautiful. As in England, the high art of a former time has still some uncanny professors, so here are some awful examples of the influence of Overbeck, Cornelius, and Kaulbach. Our concern is not with them. There is a genuine school of genre painting in Germany, and its best pupils are in Munich. Only less noticeable than the Parisian influence is the effect upon English students of education in the Bavarian capital. We have tried and succeeded, perhaps in nine cases out of ten, in "spotting" only by his work, a Munich student. Alma Tadema seems to have found a German imitator, W. E. Unger. His "Letter-box" (No. 1,098) is a study of marble and *deshabille* most closely resembling the work of our painter.

We have space only for the names of some of the most striking paintings of the French school. "La Cigale" (No. 1,208), by Armand Berton; "Followers of Bacchus" (No. 1,237), by Maxime Dastugue, an enormously clever

every mortal man after business hours. This is a popular work apparently, and is photographed and sold in the gallery.

We have noticed nothing remarkable amongst the Italian pictures. The grand landscape of Norway receives illustration at the hands of her well-known painters, Professor Hans Iude, A. Norman, and J. Tidemann. A younger man, Otto Sinding, perhaps the greatest of the school, sends No. 1,766, "The Children in the Wood." But over this section confusion reigns.

A BRIEF EXPLANATION OF THE CREMATORIUM AT MANSTON HOUSE, IN DORSETSHIRE.*

WE have received from Mr. Richards, of Wincanton, the following description of the crematorium which was used in the first instance in which cremation was adopted in England, and which was reported not long since in the papers. The cuts are taken from photographs sent to us by Mr. Richards. He writes:—

The walls of the crematorium are solidly constructed of brickwork. The interior, which is subject to the action of the fire, is wholly of fire-bricks and lumps set in fire-clay. The fireplace and ash-pit run from end to end, and the fire-grate is of ordinary engine-bars. The doors of fireplace and ash-pit at each end are of

* Used for the first cremations in England in modern times. Some of the details have been much improved.

other flues rising from the fire,—also provided with dampers. In case the crematory is preferred to be got ready before hand, these flues are only to be used while the subject is being placed in the chamber,—the other flues being closed meantime. By this arrangement smoke is prevented from issuing from the front doors while open.

I may remark that the chimney is low, but of large size, and the draught is exceedingly good. A tall chimney would be unsightly in the grounds where the building is constructed. The building is very strong, and of plain character. Of course it may be made ornamental by the use of tiles, &c., if desired.

After cremation has taken place, the ashes of the body can be collected when the building has cooled down,—a pan being specially made for this purpose.

THOS. RICHARDS.
Wincanton Iron Works, 15th March, 1884.

Archæology at University College.—

Professor O. T. Newton, C.B., will deliver in the current term a course of five lectures on "Greek Myths as illustrated by Vases and other Works of Art." The first lecture (to which the public will be admitted without payment or tickets), will be delivered this, Friday, afternoon, May 2, in the Botanical Theatre at 4 p.m., and will treat of the myths relating to Demeter and Persephone. The remaining lectures will be delivered on May 23, May 30, June 6, and June 13.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ANNUAL REPORT OF THE COUNCIL, 1884.

THE Fiftieth Annual General Meeting of this Institute will be held on Monday evening next, the 5th inst., to receive and consider the Report of the Council on the state of the property and affairs of the Institute; to elect the officers for the ensuing twelve months, and to appoint the Board of Examiners under the Metropolitan Building Act, 18 & 19 Vict., c. 122, s. xxxiii. We extract the following passages from the Report of the Council:—

The number of subscribing members in 1883, compared with that of the previous year, is here stated:—

	1882.	1883.
Fellows (inclusive of compounders).....	402	408
Associates	682	685
Hon. Associates.....	112	107
	1,196	1,200

At the present moment there are 409 Fellows, 691 Associates, and 104 Hon. Associates, 15 Hon. Fellows, 51 Hon. Corresponding Members, and 3 Hon. Members, making 1,273 in all.

The obituary notice this year possesses an exceptionally melancholy interest on account of the recent bereavement which has brought fresh grief to the Queen, and evoked from all classes of her Majesty's subjects an expression of sincere sorrow. In the death of his Royal Highness Prince Leopold, Duke of Albany, Hon. Fellow, a life of rare promise has been taken from the world, and the Council feel that, while the Institute has been deprived of one of its most distinguished members,—distinguished not in point of hereditary position alone, but in point of learning and devotion to the art,—a loss truly national has been sustained.

Mr. James T. Knowles, a Member of Council since 1880, and who served on the Council on several occasions previously, died on the 23rd March, having attended a meeting only a few days before. Mr. Capel N. Tripp, Fellow, of Gloucester, and nine Associates, namely, Messrs. A. W. Archer, W. A. Baker, F. P. Hughes (India), R. M. Marnock (Australia), W. Moffatt, R. C. Page, B. A. Paice, S. C. Rogers, C. H. Stock, and A. G. Winsor, have died since the issue of the last Annual Report. Of the Hon. Associates, Sir Edward H. Scott, Sir William Siemens, F.R.S., and Mr. William Spottiswoode, P.R.S., have died, together with John Henry Parker, C.B., Hon. Member. Among the Foreign Members, Dr. Christian Hansen (of Copenhagen), Mr. Chenavard (of Lyon), Baron von Ferstel (of Vienna, who received the Royal Gold Medal in 1882), Mr. J. B. Lesueur (Member of the Institut de France, who received it in 1861), Signor de Fabris (of Florence), and the Count Vespignani (of Rome), are deceased.

A comparison of the income derived from subscriptions shows 3,069l. 1s. in 1883, as against 3,059l. 12s. in the previous year, and a similar comparison between the disbursements and receipts for the two years shows:—

	1882.	1883.
Ordinary annual income	£3,423 8 11	£3,737 15 7
Ordinary annual expenditure	3,010 6 10	3,299 7 6

The increase of expenditure is accounted for by the payment of 100l. for the use of the arbitration-room, an increase in the librarian's salary, an increase in the printing of advertisements inserted in the Journal of Proceedings, and to the fact that the volume of Transactions for 1882-83 contained a much larger number of illustrations than was anticipated.

The entire expense of the *conversazione*, held at the South Kensington Museum, was generously defrayed by the president, Mr. Horace Jones, to which circumstance is partly due the carrying forward of a balance of 387l. 8s., as against 111l. 0s. 9d. the previous year, and this notwithstanding a special disbursement for painting the premises amounting to more than 200l.

By the rule which, since 1881, has been strictly adhered to, the entrance fees of new Fellows and Associates have been regularly invested. The capital of the Institute in Government and other securities, which, at the close of 1882, amounted to 4,330l., reaches at

* In regard to the fact that some extracts from this Report appeared a week since elsewhere, before the issue of the Report, we are anxious to say that the extracts so published were obtained "by dishonest means," and did not represent the official edition, from which this is printed.

the present moment 4,330l., the purchase of 500l., 3 per cent. Consols, having been effected in January last, in addition to 100l. of the same stock purchased at the end of 1883.

The estimate of income and expenditure for the current year, 1884, exclusive of all trust funds, entrance fees, arrears of subscriptions, special receipts and disbursements, shows receipts from ordinary income amounting to 3,650l., including 3,150l. for annual subscriptions. The estimated expenditure is 3,245l. Out of the anticipated balance of 405l., the special disbursements required for the proceedings of the Conference, the *Conversazione*, and the Competitions-Memorial Committee will be defrayed.

The relations of the Institute during the past official year with foreign societies, and with its Corresponding Members abroad, have been reported in two comparatively long communications from the Secretary on the 11th June, 1883,* and the 7th January, 1884,* and shorter references have been made at other times, all of which have been duly printed in the Journal of Proceedings. The Council have to thank Dr. Reichensperger, Hon. Corr. Member (Cologne), for a memoir respecting the Examination of Architects in Germany. A recent communication on the subject of professional practice and the relations of the employer, architect, and contractor, contained in a series of questions, has elicited from several foreign members long and valuable replies, notably from Ritter von Hansen of Vienna, Herr Ende of Berlin, and Professor Meldahl of Copenhagen. During the year relations have been entered into with the Amsterdam Society of Architects, the Society of Architects of Norway, and the Society of Architects, Boston, U.S.A.; and an exchange of publications has begun. The Royal Dublin Society and the Royal Irish Academy have made application, and have been furnished with the publications of the Institute. The Government of India, with the approval of the Secretary of State for India, has arranged a similar exchange, and in future nine copies of the Institute Transactions will be forwarded annually to India for government purposes, in exchange for which the Library of the Institute will be regularly supplied with copies of archaeological reports published by the Indian Governments.

At the two business meetings held respectively in January and March, the Members have had under consideration the desirability of issuing fuller reports of the proceedings at such meetings than has been the custom hitherto, and accordingly a somewhat long report of the discussion on the subjects, treated on the 7th January and the 24th March, has been given in the Journal of Proceedings; namely,—(1) the extension of the present Examination under the Metropolitan Building Act, 1855, and (2) the composition and election of the Council. In the former case it was decided to require any future applicant for a certificate of competency, granted by the Institute under the terms of that Act, to state that he desires to be examined in order to qualify as a candidate for (a) The office of District Surveyor under the Metropolitan Building Act, 1855, or (b) Any office of Building Surveyor, the candidates for which are, by legislative enactment, required to have obtained a certificate of competency from the Institute, or (c) Any office of Building Surveyor under such municipal or other authorities as may give to the Institute notice that they have made such stipulations a condition of candidature. This scheme of extension has since been referred to the Board of Examiners under the Metropolitan Building Act, with a request to consider and work out the details, and the Council have every reason to believe that the results will be satisfactory to all the parties concerned.

Three special general meetings have been held for the purpose of altering, enlarging, and enacting certain By-laws. On the 7th of January the By-laws XXVI. and XXVII. were ordered to stand thus:—

XXVI.—Any Fellow shall be eligible to be nominated by the Council as President, but no Member who has filled the office for two successive years shall be again eligible for the Presidency until the expiration of two years from the termination of his tenure of office.

XXVII.—Any Fellow who is or has been a Member of Council shall be eligible to be nominated by the Council as Vice-President, but no Vice-President who has filled the office for six successive years shall be eligible for re-election as Vice-President until the expiration of twelve months from the termination of his tenure of office.

* See the Proceedings, 1882-83, p. 145, and p. 46 of 1883-84.

On the 24th of March By-law XIV. was altered and enlarged as follows:—

All gentlemen engaged in the study and practice of architecture, before presenting themselves for election as Associates, shall be required to have passed an examination according to a standard fixed from time to time by the Council of the Royal Institute of British Architects; and in places where a scheme of examination, approved by the said Council, has been formulated, the examination shall be conducted, by means of sealed papers, under the charge of Members of the Institute, who shall act as moderators, superintend the oral examinations, and report thereon. In all cases the candidates' answers, written and graphic, and the reports of the moderators, shall be transmitted to the Council of the Institute for examination and decision.

The powers conferred under the terms of the enlarged By-law XIV., for regulating the admission of candidates for the Associateship resident abroad, have been rendered necessary by the establishment in 1882 of the obligatory examination, and a signal opportunity has been thereby offered to societies, or professional groups, of architects practising in large colonial cities to conduct local examinations, and facilitate participation in those advantages which membership of the corporate body of British Architects is admitted by many of them to afford. Upon this subject the Council have been recently advised by the Hon. Secretary for Australia, W. W. Wardell, Fellow, whose zealous assistance during some years has been of the utmost value. The Council feel the necessity of using great caution in the admission of applicants from the Colonies, and that, in fact, all such candidates should be possessed of recommendations from members resident in the colony whence they come, and to whom their education and practice are known.

Two examinations in architecture have taken place, one in February and the other in March. The former was held at Glasgow under the auspices of the Glasgow Institute of Architects, to the members of which body the Council desire to acknowledge their obligation. Six candidates presented themselves, and at the oral examination Mr. Arthur Cates, chairman of the London Board, presided, supported by Messrs. Campbell Douglas and T. L. Watson, convener and sub-convener of the Glasgow committee for the examination, with Mr. J. Macvicar Anderson, and Messrs. Burnet, Gordon, Honeyman, Salmon, and David Thomson. The examination in London was held at the Institute during the week commencing Monday, 17th of March, and twenty-four candidates were admitted to it. The oral examination, begun on Friday, the 21st of March, at 10 a.m., lasted until 6:30 p.m., during which time fifteen candidates were examined; continued the following day at 10 a.m.; it terminated at 3:30 p.m., during which the remaining nine candidates were orally examined. At Glasgow four of the six candidates passed, and the other two have been relegated to their studies for the space of one year, with the privilege of presenting themselves a second time for examination, without further payment, at the close of that period. In London seventeen of the twenty-four candidates passed, and six were relegated to their studies as before described.

The recommendation of the Institute that the Royal Gold Medal for the current year be awarded to Mr. William Butterfield, architect, has received the gracious approval of Her Majesty the Queen.

The annual report on the state of the library is a satisfactory document, even though the volumes presented are fewer in number than those of last year. The works purchased comprise thirty-one volumes and forty-two pamphlets for the library, and five volumes and one pamphlet for the loan collection. All current Parliamentary papers referring to subjects connected with the work of the Institute have also been purchased. The number of members who in 1883-84 have used the library during the day has not increased; but in the evenings 259 members have attended, as against 215 the previous year. A considerable increase is noticeable among those who have permission to use the library for educational and other purposes. In 1882-83 the attendances were 313 (day), and 477 (evening); this year, 1883-84, they have reached 375 (day), and 733 (evening). The subject of a new catalogue of the library having for some time past engaged the attention of the Library Committee, the Council have promised a special grant from the ordinary funds of 50l. for the preparation of the necessary "copy," which has been put in hand.

The Metropolitan Board of Works have submitted, under the 30th section of the Charing Cross and Victoria Embankment Approach Act,

1873, the architectural elevations of buildings proposed to be erected on seven plots, to all of which careful consideration was given. The statutory examinations of persons desirous of obtaining the certificate of competency to act as district surveyors were fixed for October, 1883, and April of the current year. At the former, two candidates passed and duly received certificates, namely, George Edwards, Associate, of 68, Brompton-road, S.W., and Mr. Robert Cunningham Murray, of 1, Racquet-court, Fleet-street, E.C. For the examination about to be held eight candidates have presented themselves.

A request, made to the Council on behalf of other Pugin students by Mr. Ernest C. Lee, Fellow, to consider the desirability of adding a medal to the sum of money presented to a Pugin Travelling Student after he has performed his undertaking, has been acceded to, and questions, relating to the design and character of the proposed medal, have been referred for further consideration to the Medals and Prizes Committee.

An invitation from the Executive Council of the International Health Exhibition to hold a conference during the week commencing the 23rd of June, on the "Construction of Houses with regard to Sanitary Arrangements," or on some other subjects cognate to the purposes of the Exhibition has been accepted on behalf of the Institute.

The members of a special committee appointed to carry out the objects of the memorial presented by the late Mr. Street have made considerable progress in the work entrusted to them. They are James Brooks, Henry Curry, and J. Barlow Fraser, members of Council; T. E. Collett and Ernest C. Lee, Fellows; and S. Flint Clarkson, Associate. The hon. secretaries of the committee are Cole A. Adams and Aston Webb, Fellows. Their duties consist in endeavouring to procure the written adhesion of architects, practising in the United Kingdom, to an undertaking that they will not take part in any public architectural competition unless an architect of established reputation is appointed to advise the promoters upon the relative merit of the designs submitted in the competition. The hon. secretaries report that, up to the present time, upwards of 1,300 architects have subscribed their names to the form which has been issued to the profession, and they urge all those who desire to aid reform in architectural competitions to lend their support whether they take part or not in them, so that the list of names may be as long as one as possible. To further this object, and to assist in bringing the principle contended for to the notice of promoters of competitions, gentlemen practising in the provinces have been asked to become local honorary secretaries, to assist the committee in the above objects. On the earliest intimation being received of an intended competition it is proposed to forward to the promoters of it a list of those who support the principle contended for, and a request to appoint a professional assessor.

The inquiries made this year by the committee engaged in considering the Law of Light and Air, as it affects buildings, have resulted in the receipt of important communications. Letters asking for information and opinions thereon have been addressed to official bodies, landowners, and others, some of whom have forwarded replies which will do much to assist the objects in view.

There remains the important question contained in the report agreed to by the representative of the Manchester Society of Architects and a sub-committee of the Council appointed to confer with them on the subject of the position and privileges of non-metropolitan Fellows. That report offered suggestions for ascertaining the sense of the whole body of Fellows in respect to the annual election of officers and the affairs of the Institute generally, without compelling every non-metropolitan Fellow to travel to London in order to record his vote in person, and the Council decided to meet the views embodied therein by forwarding, prior to the issue of the balloting-list for the annual election, a circular letter to every Fellow, inviting him to fill in on a blank form the name of any Fellow, or the names of any Fellows, not exceeding four, whom he would suggest for nomination in such list among the ordinary members of Council. The result has been that out of nearly 400 Fellows invited to suggest names thirty-eight responded, and the selection of the nine Fellows who had been nominated this year as ordinary members of

Council, along with the twelve gentlemen now in office, was in part determined by the papers of the thirty-eight Fellows who replied to the invitation. In regard to the enactment of the proposed new By-law XIV. a similar tentative course was adopted, and sixty-six Fellows responded, sixty-two of whom were in favour of the proposal. Before, however, entering upon this course of procedure the Council sought advice from the hon. solicitor as to the true limit of interpretation to be given to that clause in the charter which states that "at all general meetings . . . the majority of the members present and having a right to vote thereat respectively shall decide upon the matters propounded at such meetings," and the answer was that a Fellow, in order to use his privilege of voting, must be present in person. Since then an inquiry has been made respecting the custom in this particular of other chartered societies in London, and the questions asked were twofold, namely, (1) Whether members having a right to vote must be present in person to record the votes? and (2) Whether any clause in the original constitution of the body enforced the rule? It appeared from the replies that among those bodies in which the rule is that members must be present in order to record their votes are the following:—

Art-Union of London.
Geological Society.
Institution of Civil Engineers.

Linnæan Society.
Royal Academy of Arts.
Royal Academy of Music.
Royal Archaeological Institute.
Royal Astronomical Society.
Royal Asiatic Society.
Royal Botanic Society.

Royal Colonial Institute.
Royal Geographical Society.
Royal Historical Society.
Royal Institution of Great Britain.

Royal Microscopic Society.
Royal Society.
Royal Society of Musicians.
Society of Antiquaries.
Society of Arts.
Surveyors' Institution.

Among three other important bodies the rule varies. For instance, in the Incorporated Law Society, the election of members of Council is ascertained by voting papers which may be sent by post; in the Royal Society of Painters in Water-Colours, the laws preclude the settlement of business questions, except by members present, but in the election of officers proxy votes are allowed; and in the Royal Institute of Painters in Water-Colours a special provision is made for members to vote either personally or by proxy in all questions of alteration of the By-laws.

The balance-sheet and accounts, audited by Messrs. E. C. Robins and E. J. Tarver, are printed at the end of the Report.

TECHNICAL EDUCATION AND TRADE UNIONS.

THE Council of the Artisans' Technical Association issued a letter of invitation to over 100 Trade Unions to send representatives to meet and discuss with them the subject of technical education. The conference took place on Wednesday evening, 23rd April. The chair was occupied by Mr. G. N. Hooper (vice-president), Mr. Burt being unavoidably absent.

Mr. Trant explained to the delegates that one of the principal objects of the Association was that artisans themselves should conduct technical classes of artisans in their respective trades, some members of the Association who are artisans being at present so employed, but great difficulties had been encountered, owing to the apathy of working men, and it was thought that this conference might help to suggest some means by which the great advantages of technical education might be impressed upon the industrial community.

The Chairman said he had attended various exhibitions since the year 1865 in connexion with this important movement. In 1867, acting as vice-president of the Coach Builders' Society, he visited an exhibition of technical work in Paris. In 1869 his society had sent representatives to Paris to visit and report upon the schools there, the success of which had attracted students from all parts of the Continent. The City Guilds Institute offered prizes to stimulate the movement. The apathy of employers and workmen was allowing the trade to slip away from us for the want of more energy being shown in this question. He knew of several cases of workmen who had greatly improved their salaries and position by the knowledge they had gained from technical classes. In October last year a letter was sent to the secretaries of various trade societies offering full instructions to some of their members at

St. Mark's Institute. Out of twenty tickets sent only six had been used. More was being done in the northern towns, such as Newcastle and Manchester, than in London. In Germany great activity was being displayed; the question was now being mooted in America with considerable success.

Mr. Solly said that great responsibility rested upon trade unions. Artisans had no distinct and recognised society to make their real wants thoroughly known. This Association had been the means of bringing the evidence of artisans before the Royal Commission.

Mr. Hodgson Pratt said that on the Continent, whenever a workmen's congress takes place, a resolution is always moved in favour of technical education. He considered that trade unions should promote technical education among the apprentices. He would suggest that some means might be found of granting diplomas to apprentices, so that when the time came for seeking work on their own account, the holder might obtain preference over the non-holder. Trade unions should co-operate so that in the metropolitan trade schools might be founded, the teachers of which would be enabled to offer valuable suggestions to the City Guilds and Royal Commission. In the schools of Paris and Havre over 300 pupils were instructed in wood and metal work. In Germany, competitions of apprentices were held annually, at which prizes were offered.

Mr. King (Secretary to the United Society of Coachmakers), Mr. Walton (Amalgamated Society of Carpenters and Joiners), Mr. Daley (Tin-plate Workers), Mr. Fenton (Electro-plate Workers), Mr. Deans (Metal-plate Workers), Mr. Bennington (Hatters), and others, addressed the meeting.

Mr. Walton said that owing to the public chiefly requiring quantity and not quality, pressure was put upon the men, and it was found by artisans that the fact of being extra skilled and conscientious proved a pecuniary loss. He hoped that at the next conference care would be taken to ensure the attendance of a great number, and more influential representatives.

Mr. Daley said that with regard to his trade, stamped work was superseding hand-work to such an extent that every year efficient workmen were getting fewer.

Mr. Fenton remarked that no pecuniary distinction was made between good and bad workmen, and often the man specially good at "odd work" earned less wages than the less skilled workman.

Some fear was expressed by the delegates whether these classes might be the means of enabling clerks or others to learn a trade, and thus enter into competition with artisans. The delegates promised to report on the meeting to their respective societies.

Mr. C. T. Mills (Finsbury Technical College) explained that the classes held at the Polytechnic only admitted trade students, though he thought the fear with regard to clerks was both narrow and foolish. Mention had been made of other classes, but these did not give the kind of instruction that was necessary. With regard to the schools in Paris, something might be learned from them, but a complete adoption of the system would do more harm than good. The point on which he would lay particular stress was that artisans should fully recognise the importance of seeing that their real wants were properly laid before the Royal Commission, City Guilds, and other societies who were labouring for their good. He thought the widespread of technical education would not only enable Englishmen to hold their own against foreign competition, but also, by increasing the number of efficient workmen, do away with the grievance complained of with regard to odd work.

Mr. Trant moved a vote of thanks to the delegates, and hoped that at the next conference some important resolution might be adopted. A vote of thanks to the chairman concluded the meeting.

Episcopal Residence, Portsmouth.—We are asked to supplement the information given on 593 of our last number by stating that the water-tight casements in the stone windows were made by Messrs. Chew & Sons, of Stroud, Gloucester. The stoves were supplied by Messrs. Underhill & Co., Upper Thames-street, and the hearth-tiles by Messrs. Carter & Co., of the Poole Pottery Co. The quantities were taken out by Mr. Henry Smith.

QUESTIONS AFFECTING BUILDING-OWNERS AND DWELLERS IN TOWNS.

ASSOCIATION OF TRADE PROTECTION SOCIETIES.

THE thirty-sixth annual meeting of the Association of Trade Protection Societies of the United Kingdom was held on Wednesday last at the Westminster Palace Hotel, Alderman Bennett, of Manchester, in the chair, when several subjects of special interest to our readers were discussed. We append a few notes.

Local Rating.

Alderman Leske, on behalf of the Hull Society, moved:—

"This meeting, being of opinion that the present system of levying, raising, and collecting rates by different authorities in large towns is productive of great delay, uncertainty, inconvenience, and unnecessary expense, respectfully requests the Government to introduce clauses into any Bill dealing with local rating, which they have introduced, or may hereafter introduce, into Parliament, authorising the levying, raising, and collecting of local rates, by one rate, under one authority, and by one staff, instead of as at present.

That in case the Government have not introduced, or do not contemplate introducing, any such Bill into Parliament, then this meeting petition Parliament in favour of alteration of the law to the foregoing effect."

He said it was not his desire in proposing this resolution that the powers of existing Local Boards to assess rates should be done away with, but that for the purposes of collection they should be required to issue a precept upon one central authority, who should collect the rates in one. At present there were local rates levied by various authorities in a town, and collected by various authorities. That caused delay, expense, and inconvenience, and his proposition was that the rates should be levied by one authority, and that there should be only one rate-book and one set of collectors.

Mr. Fletcher, of the Liverpool Society, seconded the resolution.

Mr. Terry (London) moved an amendment exempting the metropolis from the operation of the resolution; but this did not meet with a favourable reception, and the original resolution was carried.

Rights of Light.

Mr. Hardwick, of the Liverpool Society, proposed:—

"That the interests of traders very frequently suffer in the centre of large towns, when, upon requiring to rebuild and modernise their places of business, they find their plans thwarted by reason of rights of light, which rights are frequently exercised in a manner that is not for the good of the community, and very frequently a fictitious value is put upon windows and openings of very small value, and buildings have to be dwarfed and cramped for fear of damages.

That, moreover, great uncertainty prevails, as the owner re-building has often no means of ascertaining what will satisfy his near neighbour should he refuse to declare himself, until an application is made for an injunction to restrain, or an action is brought for compensation, whereupon professional witnesses on both sides are forthcoming to minimise or magnify the value of the damage done.

That in order to prevent this uncertainty, it is desirable that an Official Referee should be appointed for each County, to whom either party might apply, and who should have authority on the spot to examine the building if standing, or the new one if erected, or the plans if not so erected, and who should be authorised to decide the size of the proposed opening, the height of proposed buildings, and the compensation to be paid; such Official Referee to be an architect of good standing, having no interest on behalf of either party, and who should be paid by fees to be prescribed. Where an Official Referee is interested on behalf of either party, the Official Referee of an adjoining County should be competent to act as Referee."

The mover argued that a very serious grievance arose from persons being allowed to build expensive premises, and their being subject, on the buildings being completed, to actions for damages on account of an infringement of rights of light. An officer should be specially appointed with power to act according to the terms of the resolution.

Mr. Beckitt (Liverpool) seconded the proposition, which was put by the Chairman and agreed to.

Fires.

Mr. G. W. Rutter (Liverpool) moved:—

"That in the opinion of this meeting it is desirable that the origin of every accidental fire whereby property is destroyed should form the subject of an investigation before some authorised officer; that the present system of leaving such investigation to the insurance companies interested does not suffice, as, frequently with a view to avoid odium, they compromise claims, notwithstanding that they are satisfied there has been wrong-doing, and they increase the premiums upon other property on purpose to meet the average losses by fires.

Resolved that a memorial be sent to the Board of Trade praying that a Bill may be introduced into Parliament to provide for an investigation before some tribunal duly authorised, where property has been destroyed by fire into the origin and causes thereof.

That this meeting suggests that coroners would be suitable officers, and their present system of inquiries with

regard to deaths might be copied for inquiries with regard to fires."

He said there was one word which he wished to eliminate from the resolution, viz., "Accidental." It was the custom whenever there was a large fire to attribute it to incendiarism. Whether that was the case or not, he thought that every fire should be traced to its source. In many cases that ought to be adjudicated upon, the investigation would be much facilitated if there were a separate court to inquire into cases of fire, and he believed this would not entail any great expense. He begged to move the resolution, omitting the word "accidental" from it.

Mr. Swift (Manchester) seconded the motion, which was unanimously agreed to.

Public Town Improvements.

Mr. Hutchinson (Nottingham) proposed without comment:—

"That the present system of owners of property demanding large compensation when public improvements are being made, such compensation frequently amounting to double or treble the value of property affected, largely tends to increase public burdens for the sake of private gain, hinders improvements because of the enormous cost, occasions the retention of unhealthy properties, and so interferes with the public health, prevents the erection of comfortable dwellings for the poor in central situations, and altogether is a source of great inconvenience in large towns.

That a petition to Parliament be presented, praying that means may be adopted for ensuring that when Corporations or Local Boards require to take properties for improving the width of streets, or the erection of central dwellings for the poor, or other public improvements, only a fair value shall be paid for such properties; such value to be based on past income, together with the ordinary saleable value of the property, in the open market, in like manner as is provided with regard to unhealthy areas, such value to be decided by a duly-constituted authority; but this benefit ought not to be granted to any dividend-paying companies, or other speculative combinations where private gain is to be obtained."

The resolution was seconded by Alderman Witty, of Hull, and carried unanimously.

Noisy or Offensive Trades.

Mr. Hutchinson (Nottingham) moved the following resolution:—

"That whereas it is essential to the well-being of the community that certain trades, some of which are noisy (such as blacksmiths, boiler-makers, and certain other mechanical trades) and others offensive (such as candle-makers, brick kilns, bone and chemical works, &c.) by reason of smell, smoke, or vapour, should be carried on; and whereas no authority at present exists to whom a person proposing to commence and carry on such trades may apply, yet such trades having been instituted an action may be brought to remove or restrain, and thereby a person carrying on such trade may suffer considerable loss;

"Resolved, that it is desirable that an authority should be instituted to whom a proposed promoter of such trade may apply for leave to carry on such trade, and such authority should be required to hear evidence in favour thereof, and the adjoining occupiers should have a right to object thereto, and the authority should have power to direct that leave be given for the establishment of such trade, and to define the conditions under which the same may be carried on."

He contended that there should be some authority to decide questions of this nature without tradesmen being liable to expensive legal proceedings.

Alderman Witty, of Hull, seconded the proposition, which was carried.

THE ROYAL SCHOOLS FOR DAUGHTERS OF OFFICERS OF THE ARMY, LANSDOWN, BATH.

THE above building is about a mile from, and 600 ft. above the level of, the city of Bath. The building, which stands in its own grounds, is approached from the Lansdown-road under a Gothic archway, having the royal arms carved above. The roadway (between an avenue of fine trees) leads by easy gradients to the principal entrance in the central tower, from the hall of which direct access is gained by means of a corridor 9 ft. wide to the reception, committee, and class rooms, on the left-hand, and school-rooms, &c., on the right-hand.

The dining-hall is a handsome T-shaped apartment 50 ft. long, lighted from both sides, and amply ventilated. The kitchens and servants' offices are placed at the north end, forming a wing extending 115 ft. from the main building, and contains laundry, engine-room, and other offices, fitted with all modern appliances for cooking, washing, and other domestic work.

The whole of the building is warmed with hot-water by Messrs. Berry & Sons, who also carried out the laundry work, cooking apparatus, and gas work.

A small portion of the façade of the building

was originally a proprietary college, but the whole was purchased by the Committee of the Royal School in 1862, when very extensive alterations and additions were made under the direction of Messrs. W. G. Habershon & Fawcner, who are now erecting the new wing at the south end of the main building, which is to contain additional school and class rooms, dormitories, &c.

Messrs. D. & C. Jones, of Gloucester, are the builders of the present new wing, the contract amounting to about 10,000l. A detached building is being erected as a sanatorium, containing four wards, kitchen, and other offices, with all appliances complete.

The Royal School is for the education of the daughters of officers of the army, and is under the management of an influential committee, the chairman being Major-General Boileau, R.E.

The scholastic apartments are arranged with special care for the comfort and convenience for both scholars and teachers, and comprise junior and senior school-rooms, class and professor's room, and about twenty music-rooms, which are separated by double stone walls, the space being filled in with silicate cotton to deaden the sound.

Covered play-grounds are arranged in the basement; and cloak-room, lavatories, and water-closets are conveniently placed for the scholars on returning to their studies from meals or play.

Four stone staircases lead from the ground to upper floors. The central portion being appropriated for the Lady Superintendents, three rooms, which are *en suite*, and the other portions are mainly divided into dormitories by means of wood panel-framed divisions, 7 ft. high, each compartment being fitted with a sponge-bath, water laid on and waste. The governesses' rooms are so arranged that they command a view of the corridor. In each dormitory bath-rooms are placed in convenient positions. The servants' bed and work rooms are in the north wing. The tower contains a clock, bell, and large iron tank.

N.B.—The separate plan in the centre of the first floor of the new wing, the ground floor of which is shown to the right of the plan.

HOMES FOR OUTCAST LONDON.

WE publish this plan—and, we believe, an executed one—for dwellings for the poorest class, by Mr. Chas. King, because it contains one or two ideas worth consideration. Mr. King thinks we must inevitably recognise the necessity for single-room dwellings for the poorest class, and arranges them with a bed-recess in the angle, and sculleries and washhouses common to poor tenements; and he suggests that the employment of thin walls—on some such plan as Mr. Lascelles' concrete cottages—would save a considerable amount of floor space in the interior. The position of the water-closets is open to objection. They would be better concentrated in two blocks for men and women, quite apart from each other. And the bed-recess system, to be healthy, should have special provision for ventilation in each recess. But the plan is not without suggestiveness.

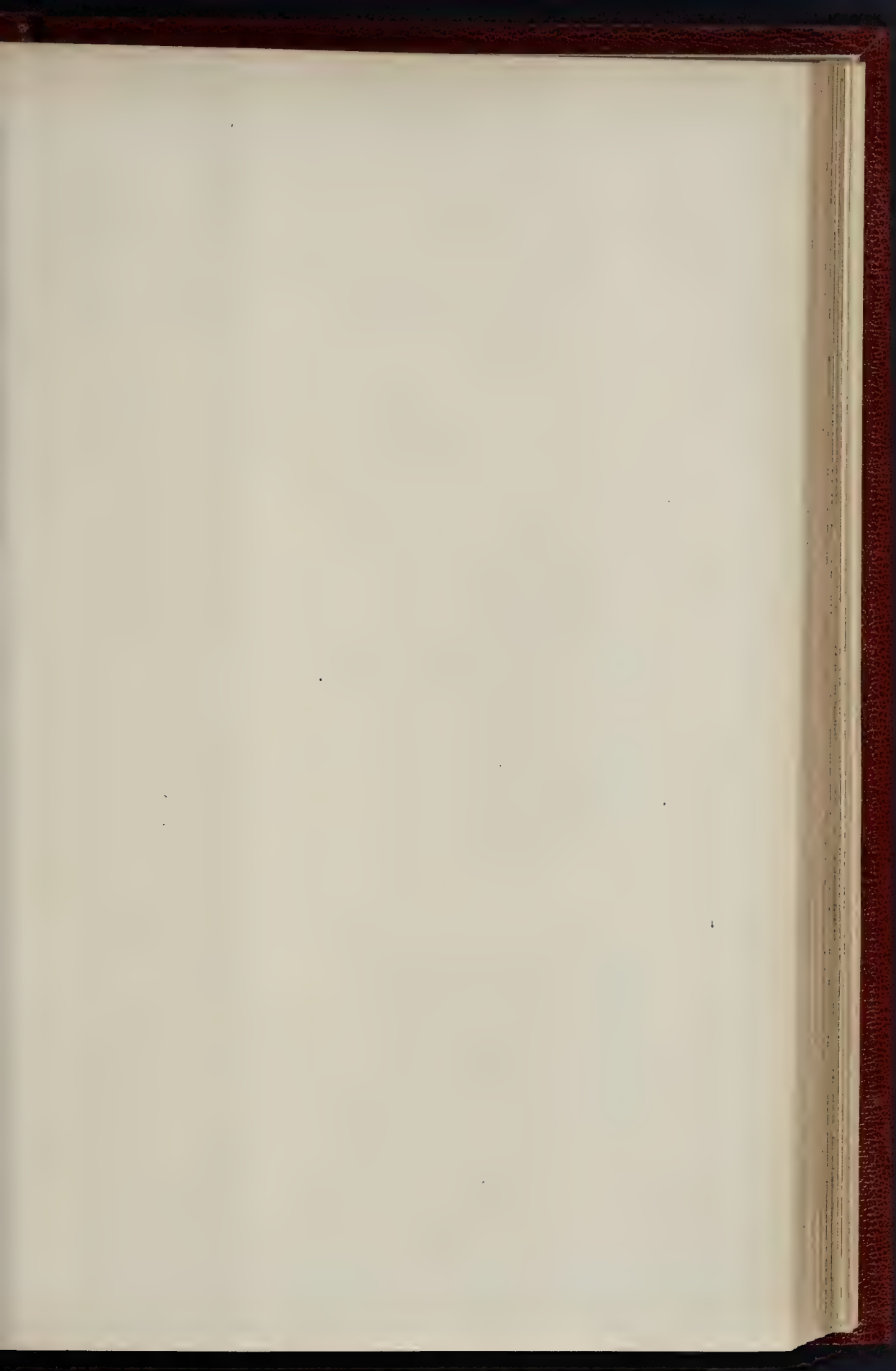
MONUMENT IN THE CHURCH OF S. MARIA DEL POPOLO, ROME.

THIS monument is now in the sacristy of the Church of S. Maria del Popolo, Rome, having been removed from the interior of the church. It is to the memory of Giovanni Ortega Goniell, bishop of Potenza, a very learned man of letters, divinity, and jurisprudence. He was promatory of Alexander VI., to which Pontiff he rendered many important services. This monument was erected to his memory by his brother, Francisco.

This plate is slightly enlarged from the illustrations to a forthcoming work on "Ancient Sepulchral Monuments," by W. Brindley and W. S. Weatherley, of which there are already printed about 200 plates, containing some 700 examples. The origin of this work is the want felt of a text book on the subject by architects and monumental workers alike.

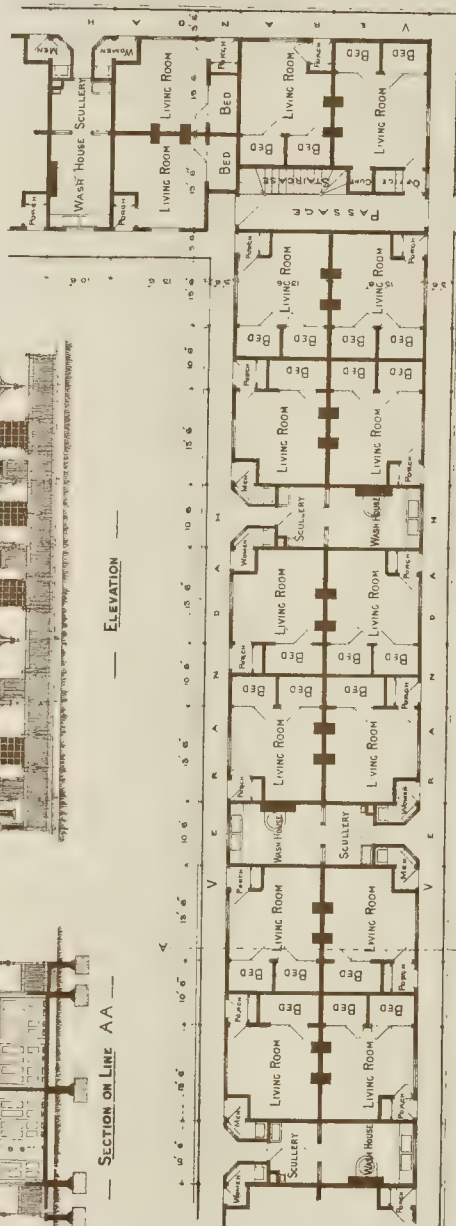
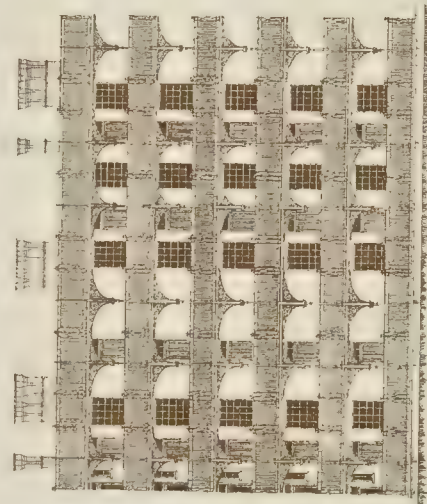
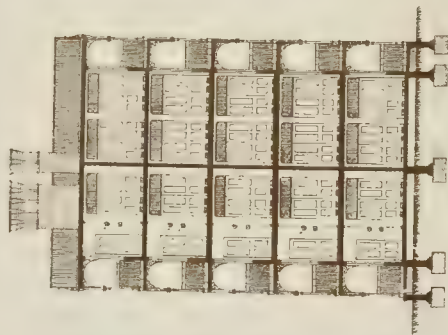
The examples are from all countries and embrace all styles, from the earliest periods to the end of the last century.

Although this work is most costly to produce, we believe it is intended to publish it to subscribers at a very cheap rate.



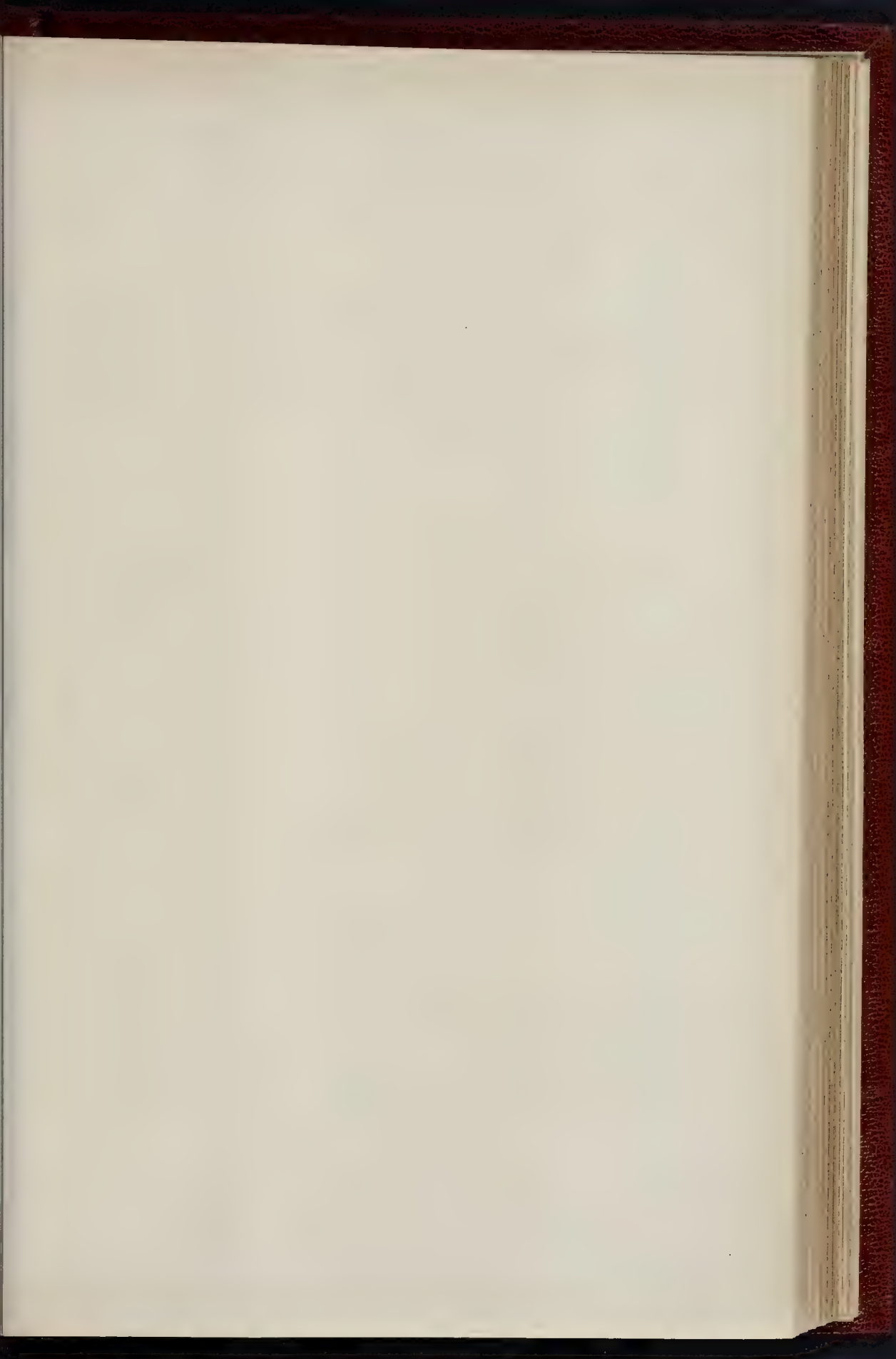
THE BUILDER, MAY 3, 1894.

— HOMES FOR — OUTCAST LONDON. —



PLAN
Scale of Feet
0 10 20 30 40 50 60 70 80 90 100

Charles Henry
1894



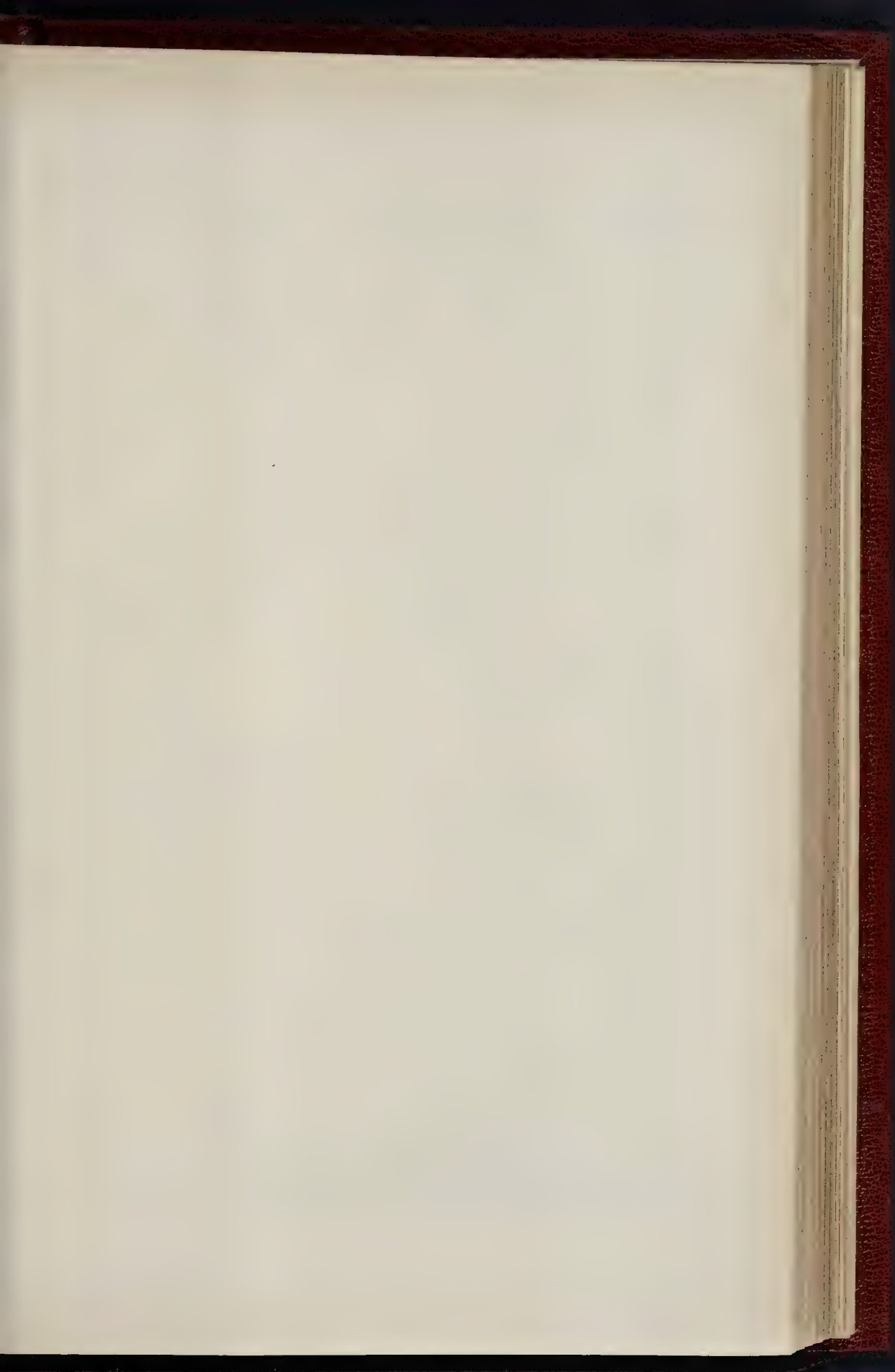
THE BUILDER, MAY 3, 1894.

Italy
To Giovanni Battista Giamini (Bx. of Perugia)
In the Sanctuary of the Church of
S. Maria del Popolo, Rome.





MONUMENT IN S. MARIA DEL POPOLO, ROME.



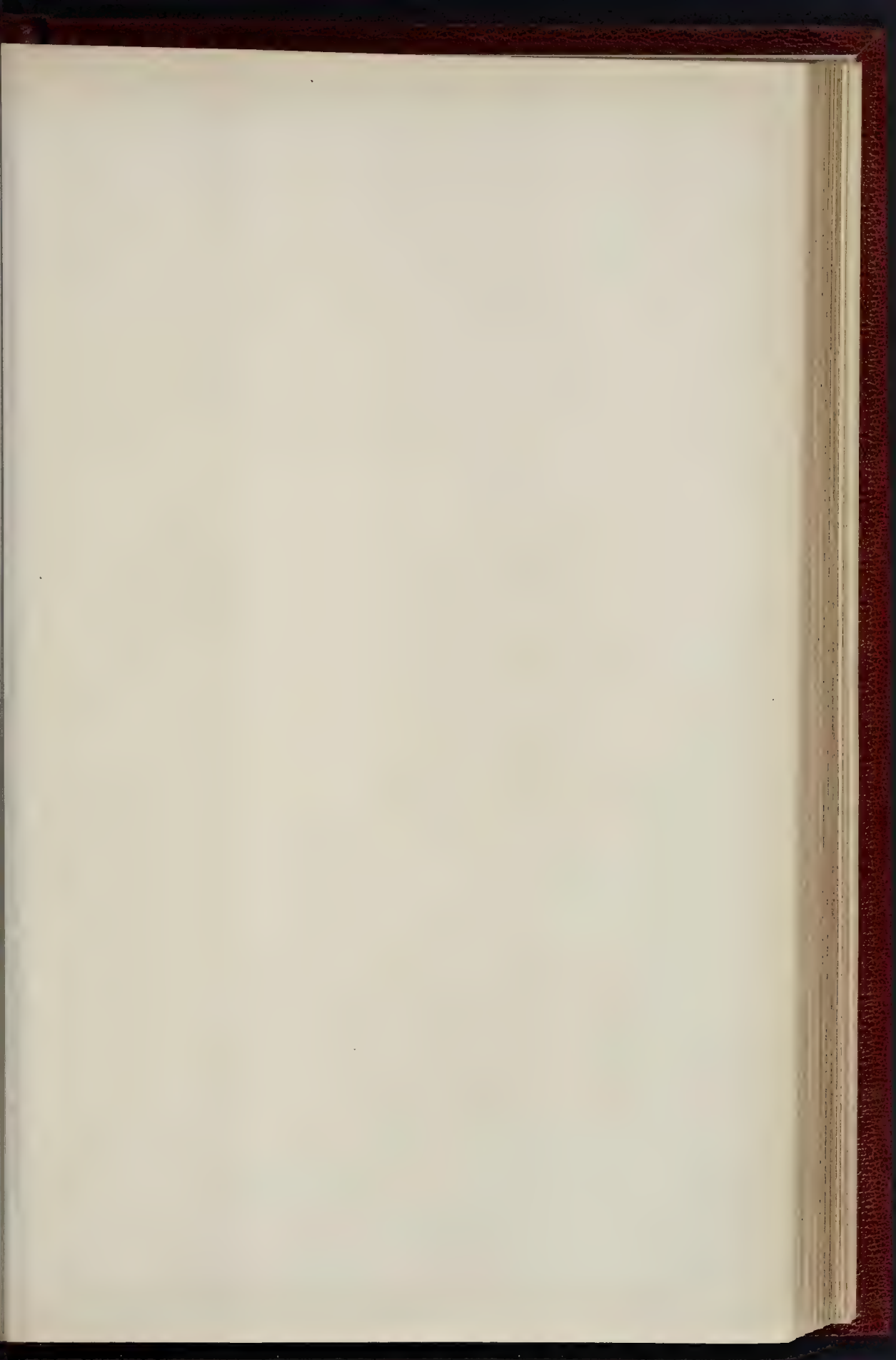
THE BUILDER, MAY 3, 1884.



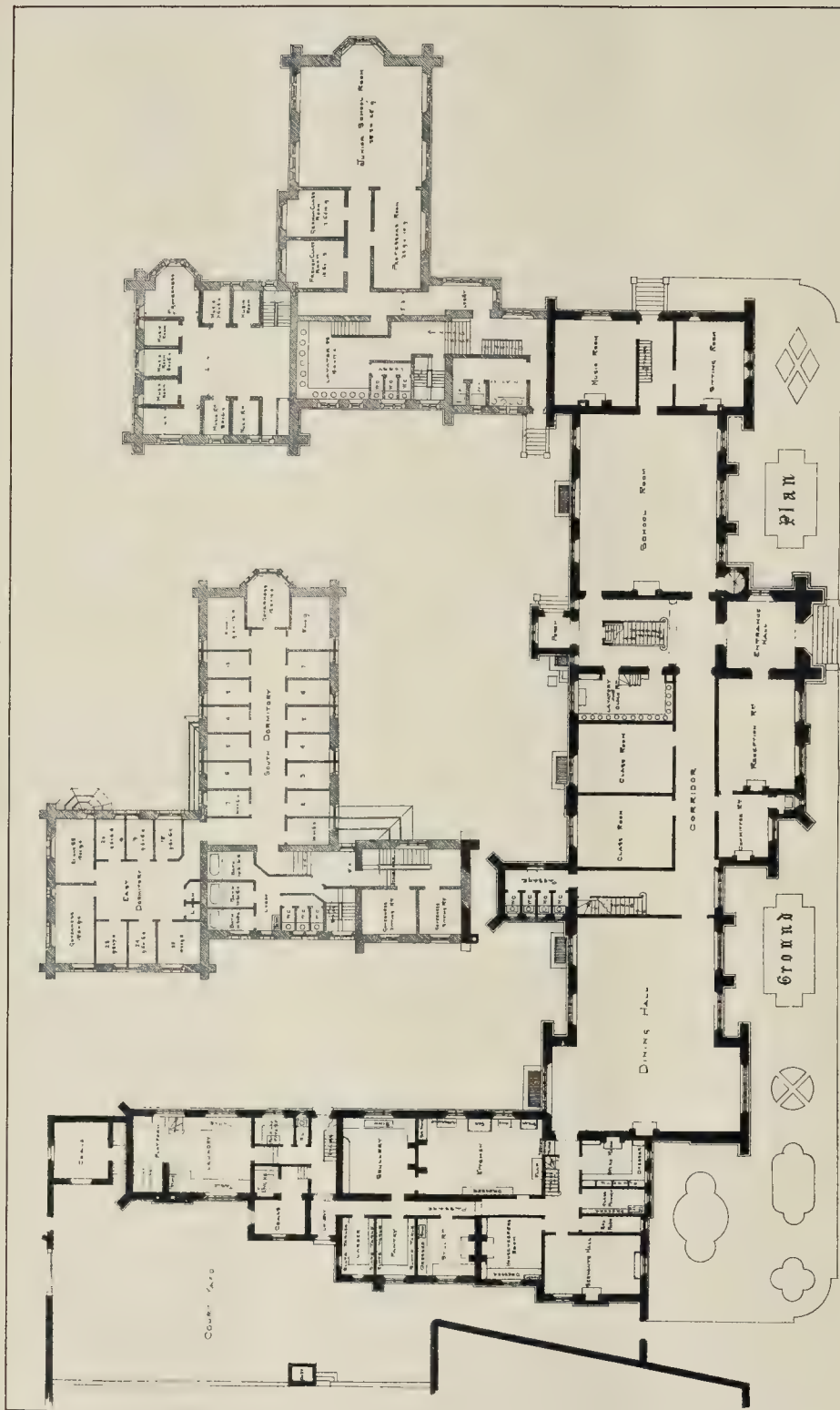


A NEW VIEW OF ST. ALBAN'S, HOLBORN.

MR. W. BUTTERFIELD, *Architect.*



THE BUILDER, MAY 3, 1884.

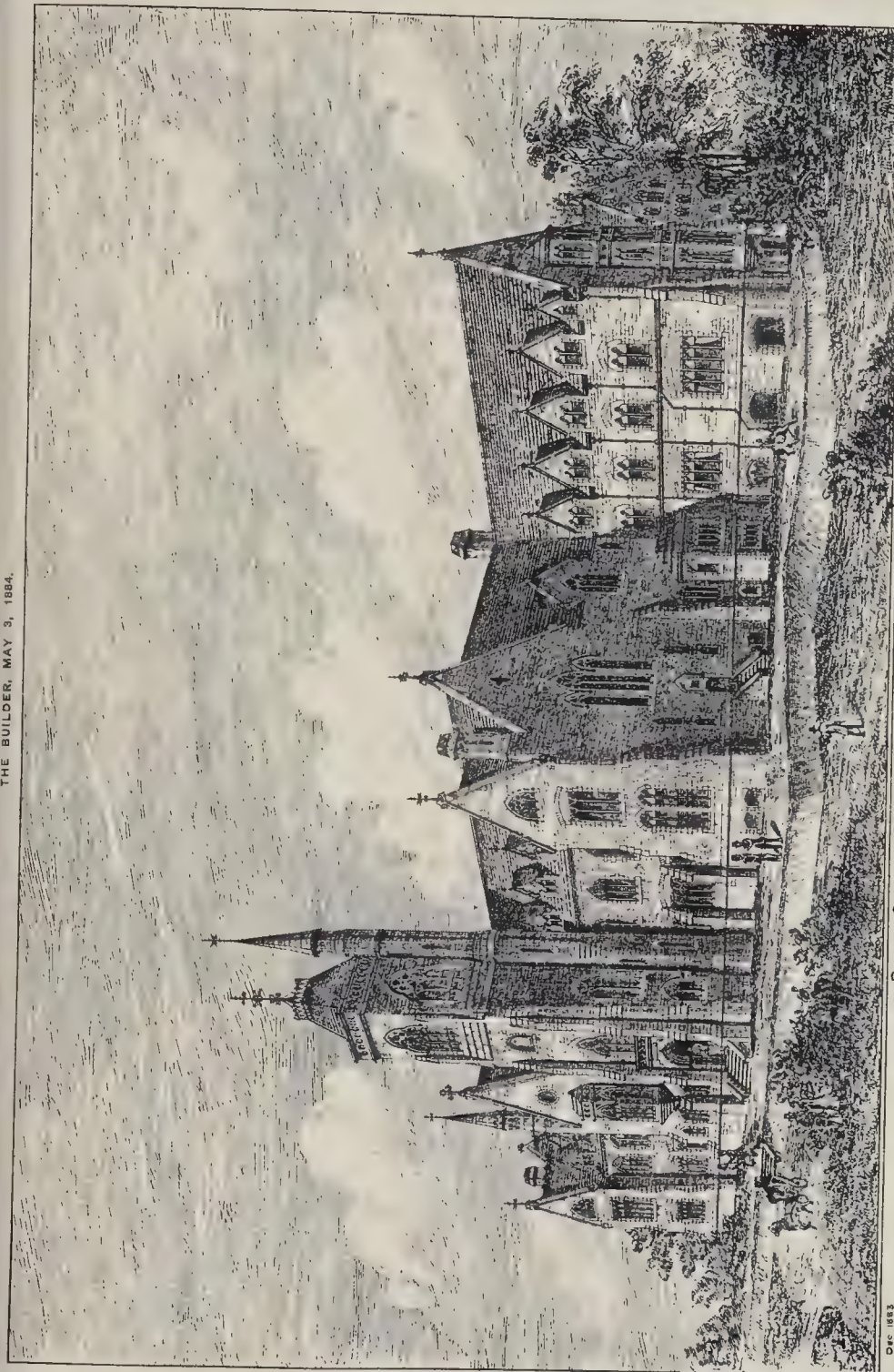


- 644 -

Whitman & Bass Architects 236 High Holborn

ROYAL SCHOOLS, BATH, FOR DAUGHTERS OF OFFICERS OF THE ARMY.

Wymann & Sons Printers, 27 Queen St.



DEC 1883

Whitcomb & Sons, Printers, 30, High Holborn

ROYAL SCHOOLS BATH AND DAUGHTERS OF THE ARMY

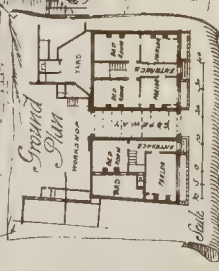
W. G. H. & Co., Architects, 11, Abchurch Lane, London, E.C. 4

Printed by W. G. H. & Co., 11, Abchurch Lane, London, E.C. 4

HOMES for ARTISANS Erected by the Trustees of Browns' Estate, William Street Blackfriars.



W. Henson Esq. ARCHA.
 Architect.



Scale

Wm. Henson Esq. ARCHA. W.C.



A NEW VIEW OF ST. ALBAN'S,
HOLBORN.

The clearance made in the process of widening Gray's-inn-lane threw open to view lately the west end of Mr. Butterfield's fine church—one of the most characteristic of his works—in a new light; and when its architect has just now accepted the award of the Gold Medal of the Institute, we have thought it would be of some interest to publish a view of the church as thus thrown open. In the simple lines and broad masses of the composition, the admirable manner in which the staircase turret strengthens and gives backbone to the whole; and in the solidity of the building, destitute of any unnecessary tricks of ornament, we see the true Gothic spirit come to life again, which is not often seen in modern buildings; and Mr. Pitts has done it full justice in his powerful and effective drawing.

HOMES FOR ARTISANS, WILLIAM
STREET, BLACKFRIARS.

A new block of buildings, forming two houses has just been erected by the Trustees of Brown's Estate, for the accommodation of artisans.

They have been constructed so that two rooms may be let out together, or a single room if required, with a general washhouse in the basement. The ground at the back being at a much lower level than in front, abundance of air and light is obtained.

Each set of rooms on the upper floor is furnished with sinks and small larders, well lighted and ventilated, and shut off from the room. A good coal-store is attached to each set of rooms; all parlours have a strong range with oven, and also a dresser; other rooms have large hanging cupboards.

The houses have been built in a simple but substantial manner, and special attention has been given to the consideration of two vital points in the construction of this class of property, viz., to guard as far as possible against the damage and destruction of the rooms, and to prevent the accumulation of vermin.

The walls are of stock bricks with Brown's red bricks to cornices, strings, and panels of front; the doorways having jambs and arches in tinted glazed bricks. A very efficient damp course has been formed with Dussek's patent damp-proof bricks, the joints filled in with his impervious cement.

The whole of the internal partitions are brick-nogged. The whole of the plastering is executed in Selenitic cement, finished down to floor behind skirtings. A chamfered deal chair rail 6 in. wide is run round all the walls, which is a great saving thereto. All sashes are double hung with Garner's patent cut-glass sashes. The locks and furniture are Kaye's patent. All woodwork is grained and varnished, and the dados are papered and varnished. A ventilator is provided over each door from passage.

The water-closets are supplied with syphon waste-preventing cisterns, and the drains are arranged with inspection openings so as to examine them with ease in case of any stoppage.

A gateway has been formed under one house for access to a large engineer's workshop at back, known as Artios Works, where the well-known and very old-established firm of Mr. W. Speller carries on the manufacture of hydraulic pumps, &c.

The works have been carried out in a highly satisfactory manner by Mr. J. B. Axford, builder, of 4A, Henry-street, Gray's Inn-road, from the designs and under the superintendence of Mr. W. Hewson Lees, of 27, Doughty-street, Mecklenburgh-square, W.C.

Artistic Bazaar in Aid of Mrs. Gladstone's Convalescent Home.—On the 19th of May, Mrs. Gladstone will preside at an interesting gathering in the new studio of Mr. Adams Aulton, the sculptor, whose energetic wife (in association with many of the leading ladies of St. John's Wood) has arranged to hold a bazaar of an artistic character, with the environment of her husband's classic studies, in aid of Mrs. Gladstone's Convalescent Home. The success of the amateur plays which were recently enacted there on behalf of the same charity has kindled fresh enthusiasm on its behalf, and given great encouragement to the workers of the "Sunny Side Bee," founded by Mrs. Adams Aulton. Lady Frederick Cavendish will preside on the 20th of May.

ART-MEETING OF LONDON.

ANNUAL MEETING AND DISTRIBUTION OF PRIZES.

The forty-eighth annual meeting of the Art-Union of London was held on Tuesday last at noon, in the Adelphi Theatre, by the permission of the lessees, Messrs. A. and S. Gatti.

The chair was taken by Mr. George Godwin, F.R.S., Vice-president.

Mr. Hallett, member of Council, read the annual report, which was as follows:—

The subscription of the year amounts to 9,634, 5s. 6d. Such a decline is no more than might be anticipated from the almost universal depression at present existing, not only in England, but in all parts of the world. In fact, all things considered, it is a matter for congratulation that so large a sum should have been gathered for what is, after all, not a matter of vital importance, such as supplying the necessary demands of every household. The accounts of the year have been audited by Messrs. J. Nicklin and W. Wright, to whom thanks will be presently proposed.

The following is a brief summary of the receipts and expenditure: a detailed account will, as usual, be printed in the report:—

Amount of subscriptions	£9,634 5 6
Allocated for prizes	£2,410 0 0
Set apart towards providing works of art for accumulated payments	609 0 0
For point of the year almanack, exhibition report, and reserve	3,455 15 1
Agents' Commissions and charges, advertisements, printing, postage, rent, &c.....	3,169 10 5

To the Local Honorary Secretaries and Agents in all parts of the world the thanks of this meeting are especially due, since at such a time the difficulty in getting subscriptions is much greater than when money is abundant.

The amount to be expended on prizes will be thus allotted:—

1 work at	£100
1 "	75
1 "	60
2 works at	50 each
3 "	45 "
3 "	40 "
4 "	35 "
4 "	30 "
5 "	25 "
6 "	20 "
12 "	15 "
20 "	10 "
12 Framed chromo-lithographs of "Bellagio,"	
2 Framed proofs, "Countess of Bedford,"	
200 Sets of Designs from English History,	
50 Portfolios of 24 plates of Annual Life,	
30 Silver Medals of Sir Gilbert Scott, R.A.	

Making, with the prizes given to unsuccessful losers, 605 prizes.

It is our custom in these reports to note the losses sustained through death in the ranks of art during the past year.

On the 7th of September last died Mr. George Cole, in his seventy-fifth year. He began his career at Portsmouth as a portrait and animal painter; he then turned to London and occupied himself with landscape painting, exhibiting at the British Institution in 1841. He joined the Society of British Artists in 1854, and was a constant and very meritorious exhibitor there till his death.

On the 5th of October Mr. Robert Garvin, R.S.A., was taken away. When about twenty-one years of age Mr. Garvin entered the School of Design, under the late Mr. Denman, and had as fellow-students Sir W. Fettes Douglas, T. Facer, Frazer, and others. He devoted himself chiefly to the painting of Moorish subjects.

In December last died Mr. Richard Doyle, son and pupil of him whose humorous drawings delighted the public of a past generation as "H.B." His was one of the brightest talents enlisted in the service of *Punch*. Thirty-five years ago. He was one of the most witty and fanciful of caricaturists.

We cannot pass without notice the death of Mr. Thomas Holloway, on the 26th of December last, who, though not an artist himself, was one of the most munificent patrons of art in late years. Had he begun to collect pictures at an earlier period he would, probably, have amassed a gallery of modern art unequalled in cost and magnitude. About four years ago Mr. Holloway astonished the world by giving 30,000l. at one sale for seven pictures. He subsequently made large purchases in succeeding years, and his gallery near Virginia Water contains specimens of the work of most of our best artists.

On the 15th of January last was announced the death of Mr. Emma Huggins, Engraver of the Royal Academy, in his sixty-ninth year. He came of an artistic family, his father being an eminent engraver. His works best known to the public are "The English Merry-making," "The Railway Station," after E. H. B., and "The Invention of the Stocking Loom," after Elmore.

On the 8th of March last died Mrs. H. Cordelia Angell, one of the most accomplished members of the Royal Society of Painters in Water Colours. She was distinguished for the taste, tact, and brilliancy with which she painted flowers and similar subjects.

In the same month, at Cheriton, near Chester, Mr. William Higgins was taken away. He was educated at the Liverpool Academy, and began to practise his profession at a very early period. Cattle, sheep, and above all, lions and tigers, interested him especially, and he drew them in all moods and attitudes with such remarkable felicity that the title of the "Liverpool Landseer" was far from being an undeserved compliment. Amongst his most ambitious productions were "Daniel in the Lion's Den," "The Disobedient Prophet," "Christian in Sight of the Lions."

In August last Mr. B. Calvert died. Early in life he was a friend of Blake, whose work exercised considerable influence on his own. He produced designs for book illustration, which are now somewhat scarce; and are beautiful, full of thought, and instinct with poetic feeling. "Nymphs" was his first exhibited picture in the R.A. of 1836. "A Shepherdess" was in the same gallery in 1837. In the

latter year he was one of the few who attended Blake's funeral at Bunhill Fields.

Very recently the Royal Society of Painters in Water Colours has lost two distinguished members, Mr. H. Britten Willis, and Mr. Alfred Newton.

During the past year the number of new buildings conducive to the cultivation of art founded in this country has not been very great; but there is one remarkable instance in the New Municipal Buildings in Glasgow, which comprise art galleries, and afford a striking proof of the public spirit of the old city on the Clyde. A competition of designs for the building was started in the year 1882, and resulted in the selection of those of Mr. William Young, and the work was at once taken in hand. The estimated cost is no less than 250,000l. The style adopted is the Renaissance, and the foundation stone was laid, with Masonic honours, by the Lord Provost of the city, the Hon. John Ure, on the 6th of October last. The building is described as being of great extent and fine proportions, and well supplied with all necessary galleries, reception rooms, &c. A notable feature of the day's proceedings was a remarkable procession, consisting of fully 25,000 persons, and reminding us rather of the old gatherings of the Guelphs in the Netherlands, than of any scenes in our prosaic times. The cortege consisted of appropriate representatives of every kind of calling, with various models showing the tools employed, and the workmen using them, interspersed with bands and banners.

On the 7th of July last, the Duke of Somerset performed the ceremony of opening the Technical School and Fine Art Exhibition at Huddersfield, in the presence of a large gathering of the people. The Huddersfield Mechanics' Institute dates back more than forty years, and during that period it has performed much valuable work with regard to technical education, but it was felt that still further opportunities should be afforded to enable the workmen to carry on successfully the existing competition with foreign nations in the works which they produce. A committee was accordingly formed, and it was determined to erect a new building, at a cost of 20,000l. Plans were furnished by Mr. Ed. Hughes, architect, and a commodious building, with the necessary art-rooms, chemistry, and drawing rooms, &c., has been erected. In the new building was collected a highly-interesting exhibition of various works of art.

In the early part of the year the Piccadilly Arts Company erected a spacious building near St. James's Church, comprising well-proportioned and well-lighted galleries, a hall for meetings, &c. The galleries are occupied by the Institute of Painters in Water Colours, who had found their old room in Pall-mall inadequate to the demands made on it. The Institute, in its new quarters, takes a fresh departure in point of detail, inasmuch as its walls are open to all competent contributors irrespective of membership. It promises also the institution of free schools of water-colour painting, in emulation of the Academy free schools.

The exhibition of the works by Sir Joshua Reynolds, at the Grosvenor Gallery, was admirable from all points of view, and bore testimony to the genius and the remarkable industry of the artist.

Last year we noticed, with much satisfaction, the exhibition set on foot by the Rev. Samuel Barnett, at St. Jude's Whitechapel, for the benefit and instruction of the hosts of persons dwelling in that neighbourhood. The exhibition, resumed this year, has been more successful than ever; 250 pictures were lent for exhibition, including cartoons by Millais, Watts, Boughton, Briton Riviere, and others.

We must not omit to notice an interesting exhibition of groups in terra-cotta, by Mr. Geo. Towner, the subjects being chiefly taken from the New Testament History, and manifesting great skill and originality.

From the programme which has been published it appears that the forthcoming International Health Exhibition, to be held in the same place as the "Fisheries" of last year, will be even more extensive than that remarkable show, inasmuch as the Albert Hall itself and its galleries, and the new building above mentioned, for the City of London Technical Institute, will also be put at the disposal of the Executive Council. Under the head of appliances relating to health there is scarcely any commodity of any kind that cannot be in some way brought in. In relation to the aesthetic may be mentioned an ample illustration of costume, in a series of models showing the changes of style in this country, from the Conquest to the present time. Nor will the claims of art proper be overlooked, inasmuch as it is intended to include an exhibition of the results of the instruction given in the art-training schools in all parts of the country.

Amongst artistic new buildings recently erected in this country is the Central Technical College at South Kensington, now nearly completed. The foundation column was laid by H.R.H. The Prince of Wales, on the 18th of July, 1881. For 300 feet the building fronts the Exhibition-road, closely adjoining the Natural History Museum, designed by the same architect, Mr. Waterhouse, A.R.A.

It is a matter for congratulation that Government proposes forthwith to make the much-needed additions to the building of the National Gallery, the existing space being quite inadequate to the due exhibition of the works now therein contained. It may be hoped that ultimately new quarters will be found for the soldiers now occupying the north-west corner of the ground, and in the meantime the Office of Works proposes to take the first step towards the necessary enlargement.

Amongst the important additions which have been lately made to the South Kensington Museum is the great Indian Court, perhaps the most interesting, and certainly the most extensive. Owing to its great size and height it has been found possible to reconstruct within it whole fronts of houses, and large portions of buildings, so that instead of merely studying Indian architecture piece by piece, we now get a good idea of the general effect of the street architecture of that wonderful country.

A matter now causing considerable interest amongst architects is the competition for the costly buildings about to be erected for the War Office and Admiralty in Spring Gardens. On the 17th September last, a paper was issued from the Office of Works containing the conditions, and plan of the site for the new building. The final designs have not yet been completed.

For the coming year the Council have engaged Mr. Willmore to engrave a plate which will form an appropriate companion to "The Loss of the *Revenge*," given for 1881. It is from a painting by the same artist, Mr. Greely, marine painter to her Majesty, representing Sir Wm. Winter in the *Fingard* attacking the starboard wing of the Spanish Armada. While the former scene represents the calm and subdued aspect of a vessel come to rest after a hard fight, and standing at bay, though not conquered, the present affords the spectacle of a fierce battle in the height of its fury. Motley thus describes the scene:

"On August 8th, 1588, the invincible Armada was

Houses at Kensington Court.—In reference to our report of the visit of the Architectural Association to Kensington Court (p. 590 *ante*), we are asked to mention that all the parquet floors on the ground and first floors in the first house, built by Messrs. Holland & Hannen from designs by Mr. J. J. Stevenson, are to be executed by Mr. James F. Ebner, of Clerkenwell-road; likewise all the parquet floors, marble mosaic floors, marble mosaic steps, and terrazzo paving, in the adjoining thirteen houses, built by Mr. Henry Lovatt from the designs of the same architect.

various degrees of maximum pressure, and it is therefore necessary that machines of the description in question should be so constructed that their pressure can at all times be easily regulated.

There are some other points of importance referred to, viz.:-

1. The speed with which the pressure is allowed to be exercised. According to observation, the nature of the material under treatment affects this question, and the machine should allow of its working in this respect being regulated.

2. The machine should have an appliance by means of which the air mixed with the raw material can easily escape during the pressing.

3. There must also be an appliance by which the material treated is brought to the press in as small pieces as possible, whether the same is dry or in its natural condition of moisture.

According to the statement of Herr von Mitzlaff, improved hydraulic presses have been placed in the Trotha-Sennowitz brick-works, and have produced results of an unexpectedly satisfactory character. The raw material is, even in winter, worked in the press, and the bricks are put at once into the ovens. The earth is reduced to small pieces and mixed with the sand or other substance required. From the press the bricks are at once placed in the oven. In the first five weeks of these presses being in operation, 400,000 bricks were made by relatively unskilled workmen.

The press consists of a table, which can be turned, in which there are six pairs of moulds. Of the latter two pairs are always being filled, two are under pressure, and two are being emptied of their contents. This process is automatic in its action. The press delivers twenty-six to thirty-two bricks per minute, according to the nature of the earth under treatment. Every brick is subjected to a double pressure, the first expelling the air and the second compressing the substance of the brick. There are besides two double-action pressure pumps and an accumulator connected with the machine. When once the pressure has been regulated it remains constant. About 8 to 10 horse-power is the amount of motive force necessary.

The bricks produced have well-cut edges, and the lengthy process of drying in the air is avoided; the carrying on of manufacture being thus practicable at all seasons and in all weathers.

EXTENSIVE NEW DOCKS AND RIVER WORKS AT PRESTON.

THE Corporation of Preston are about to commence the construction of spacious new docks, together with the deepening of the channel of the river Ribble, from the quays at Preston to the point where the river falls into the Irish sea, a distance of about twelve miles. The undertaking, which is estimated to cost 600,000*l.*, involves important mercantile interests, so far as Preston is concerned, inasmuch as when the intended works are completed, vessels of the largest tonnage will be able to come up to the quays. The works, which have been designed by Mr. Edward Garlick, C.E. (who has been appointed by the Corporation as engineer to the undertaking), include the construction of a main wet dock, containing an area of forty acres, in the centre of the Ribble valley, between the existing river course and the intended diversion of the channel. The dock will be 3,240 ft. long and 600 ft. wide, having around it 6,565 lineal feet of quay space; a jetty 1,000 ft. in length, and 130 ft. in width, giving an additional 2,000 ft. of quayside. The sill of the dock will be 29 ft. below high water of ordinary spring tides. Four large warehouses, extending the entire length of the dock, are to be erected on the east side. In addition to this main dock, and connected with it, a timber dock of twenty-five acres is to be constructed. The entrance to the main dock from the river will be through a dock basin, 750 ft. long and 300 ft. wide, and thence through two locks, 225 ft. and 325 ft. in length respectively. Near to the entrance to the main dock, but away from the general business of the dock, there will be two large graving-docks, thus providing facilities for shipbuilding, which, during several years past, has been carried on at Preston to a considerable extent in the construction of vessels up to about 1,000 tons burthen. The dock gates will be 66 ft. in width, and these, as well as the coal-

tips, capstans, and cranes for loading and unloading, will be worked by hydraulic machinery.

The diversion of the channel of the river near Preston is not the least important feature of the works about to be carried out, as, in addition to the intended new channel being more direct, about 100 acres of land will be reclaimed. A short distance from Preston the present channel takes a circuitous route. According to the plans, this portion of the channel, for about two miles in length, is to be filled up and converted into "made" land, and in its place an entirely new and straight channel is to be cut, having a uniform width of 450 ft. The channel of the river from the docks to the sea is to be deepened by dredging and scour to 30 ft. below high water of ordinary spring tides, and in order to facilitate the execution of this section of the works training walls are to be constructed, for the purpose of fixing the position of the channel in the estuary. In constructing these walls the rock to be excavated for the formation of the docks will be utilised. Sir John Coode, C.B., the consulting engineer to the undertaking, in a report which he recently presented to the Corporation, after making an examination of the channel to its mouth, and opening into the Irish Sea, states that the deepening of the river and making it navigable for vessels of the largest tonnage, as now constructed, presents much less difficulties than were experienced in the Clyde, and he adds that the Ribble may be regarded as a river which, when once deepened artificially by dredging, and by the formation of training walls, may be relied upon to maintain the improved depth by natural scour, and the influx and efflux of the tidal waters.

Mr. Garlick, the engineer, recommends that the construction of the dock works generally, and the diversion of the river, should be let by contract; but that the deepening of the river by dredging should be carried out by the corporation's own workmen.

COMPETITIONS.

Wesleyan Church, Scarborough.—In the competition for the new Wesleyan Church at Scarborough, the design of Mr. J. Morley (Bradford) has obtained the first premium, and that by Mr. J. Hall (Scarborough) the second. The hon. secretary reports "sixty-four excellent plans sent in from all parts of the country." We can only regret that sixty-two gentlemen have wasted time, patience, and ability in deference to such a cumbrous and wasteful method of obtaining designs.

Swansea Free Library Buildings.—A meeting of the Property Committee of the Swansea Corporation was held on Monday last, when twelve designs for the proposed new free library and art gallery were considered. After a long deliberation, the committee decided to accept the designs of "Goren Donian Grybodaeth," "Morganwg," "Utile Dulci," and "Con Amore," subject to the approval of the council. The matter has been referred to the President of the Royal Institute of British Architects, who has been asked to name some suitable gentleman to go through these four designs, and decide which in his opinion is the most suitable for the purpose.

CONFERENCE MEETING OF ASSOCIATES R.I.B.A.

SIR,—The Council of the Royal Institute of British Architects having granted the use of the meeting-room at 9, Conduit-street, for a special meeting of the Associates, on Wednesday, the 7th of May, at four p.m., as a part of the proceedings of the forthcoming Conference, I should be much obliged if you would allow me to state in your columns that I shall be glad to receive communications from Associates on any subjects of interest to that meeting.

G. RICHARDS JULIAN,
Hon. Sec. Associates' Conference Meeting.

8, Delahay-street, Westminster, S.W.

"Art Applied to Coach-Building."—This was the subject of an able and interesting paper, read on Tuesday evening last by Mr. Henry Julian, of Bolton, at a meeting of the Institute of British Carriage Manufacturers. We hope to print some portions of it in our next.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ITS PRESENT POSITION AND INFLUENCE.

SIR,—In relation to the discussions now taking place respecting the position and influence of the Institute, and the considerations referred to in Mr. Whitcomb's letter to the members of January 5th, 1884, it should be borne in mind that the action of the Council has not always proved conducive to the real interests of the members as a body, though we may assume that their intentions were good in the main, and in some cases the results were beyond their control.

It seems very desirable that new members should be introduced into the Council periodically, to prevent a tendency towards indifference or abuse; and it would be an excellent plan to elect some provincial Fellows now practising in London. The Associates should, in fairness, undoubtedly have more voice in its affairs, and be eligible to serve in more capacities than at present; and perhaps the fees might be lowered with advantage, especially to provincial members.

Reforms in this and similar directions are necessary to prevent disaffection at present existing, which is sure to recur unless facility is given to attach the "rising spirits" of the time, and afford an outlet for their energies. The present threatened establishment of another society is an indication of the need of this, but it is a move in the wrong direction; union is required to unite and concentrate interests and energies, and all the societies and associations throughout the country should be affiliated to the Institute, those in each town or city being branches one of the other.

RESULTS OF ACTION ON COMPETITIONS.

In the recent revision of the "Suggestions" respecting Competitions, advantage should have been taken of the opportunity of using the influence and authority of the Institute to discourage the system as much as possible, instead of which the action of the Council has tended in a contrary direction; this is rather incomprehensible after the exposures in the Committee of Inquiry.

The main object of the committee (which sat for a considerable time) was to reduce the cost and labour to the competitors, and in the "suggestions" issued it is stated that "moderate cost only is intended."

The order of the Suggestions A, B, and C to promoters of competitions ought to have been reversed, and it made clear that simple sketches were sufficient in almost all cases; also that "double competitions" were only applicable in exceptionally large and important buildings. This was pointed out at the time by more than one member, and by the Leeds and Liverpool Societies.

It appears perfectly plain that, unless architects generally, and the heads of the profession in particular, show more respect for, and appreciation of, the value of their own time and labour, the public cannot reasonably be expected to estimate it very highly.

The principle of "sketches" is good in itself; but it should be limited to mere sketches. Mr. Barry missed it altogether at Glasgow, in the application of the principle, by sanctioning two complete sets of drawings: the first being a series in miniature, and the second $\frac{1}{2}$ in. scale, as large (or larger even) than necessary for working drawings, and including a plan of the roof!

It is absurd to work out so much detail before arriving at a decision, and a shameful waste of time and labour; some further change in the mode of procedure is absolutely imperative, as the large number of drawings dictated in these and other cases is more favourable to committees and assessors than to the unfortunate competitors.

Excessive labour and cost have been thus sanctioned by members of the Council, which will serve as a precedent for the future, unless modified under their authority; and it has the disadvantage of being now made compulsory instead of optional as formerly. No important buildings will be obtainable in future without wading through so much rubbish.

It will be remembered that in Mr. Porter's statement of results of twenty-seven competitions in the years 1877-8, under 5,000*l.* in value, the results were:—

Total payments by the profession	£8,968
Cr. commission and premiums	5,777

Actual loss to the profession	£3,191
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And on nine competitions in the same years from 20,000*l.* to 100,000*l.* in amount:—

Total remuneration to the profession	£23,230
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Total payments by the profession	16,350
Office expenses	8,927

For the Glasgow Municipal Buildings, it may be assumed that each set of sketches cost, at a moderate calculation:—

60 <i>l.</i> x 110 sets	£6,600
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Commission on 250,000 <i>l.</i>	£12,500
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And in the recent "Government Offices" competition, say each set cost 100*l.* by 125, 12,500*l.*; or half the amount to be paid to the architect appointed in each case.

In all probability there is sufficient done already to start an expert to arrive at a decision without further enlargement of scale.

The appointment of assessors may be good in principle, but it is not sufficient to meet the evils of the system. It would be more to the purpose if architects of standing would unite in abstaining altogether from public competitions for a term, instead of the present proposal of the "Memorial Committee." Some such drastic measure is needed to put an end to the wild and unseemly game of speculation now in vogue, which has degraded the art of architecture into a system of gambling and lottery, from which some earnest and vigorous effort should be made to rescue it.

A PROVINCIAL A.R.I.B.A.

THE PROPOSED CHANGE AT THE INSTITUTE.

SIR,—I have read with much interest your remarks upon the proposed change at the Institute, having formerly been a Fellow. I resigned upon the subscription being raised to five guineas, just for uniformity's sake, as it was stated at the time. In my case the benefit of placing F.R.I.B.A. at the end of my name amounted to nothing, living 120 miles from London. I have to buy my own library, and the substance of the papers read is always given in your paper.

I remember stating before a large and influential committee that I was a Fellow of the Institute of Architects, to which the chairman,—a very shrewd man,—replied, "Oh, gentlemen, that is the architect's 'trade union'." I am sure architects putting F.R.I.B.A. and Esquire after their name upon big advertising boards, it is not calculated to make people think more highly of the honour.*

No doubt we ought all to belong to the Institute, and I believe there are quite as good men in the country as in London; but you cannot expect us to pay a high subscription for the sake of supporting a library and club for London men, for that is what the present system amounts to. That the Institute does not promote good feeling, the late letter respecting the Public Offices competition proves.

THOMAS S. POPE.

Bristol, April 28, 1884.

COMPETITIONS-MEMORIAL COMMITTEE.

SIR,—It will, we hope, be of some interest to the profession to learn that up to the present time upwards of 1,350 signatures have been received to the undertaking "not to take part in any public architectural competition unless an assessor or assessors of established reputation are appointed to advise on the designs sent in."

We have naturally had several points raised by architects practising throughout the country in consequence of the committee's appeal, though they heartily agree with the reform desired; and our object is to ask you to allow us to state the chief of these and the views of our committee upon them.

1. The objection of "trade unionism" is one which may be urged against all combinations, but without some joint action of this sort no great reform could be carried out.

2. The natural fear expressed by some architects, more especially by those out of London, that they may, by binding themselves, give an undue advantage to those who do not, should, we venture to think, be an additional reason for each individual to join; as without a considerable amount of unanimity success in the direction we are aiming at cannot be assured; but if this support is given, the public will in a short time find that their best interests are served by complying with so reasonable a requirement.

3. It is said by some, that they are not interested, as they do not compete; we ask them, however, to aid those who do, in removing what has long been felt to be a scandal in the profession.

4. It is said that competitions decided by professional assessors are not always satisfactory; but, even if this be so, they go a long way to prove that it is not a considerable step in the right direction.

5. The committee have been asked what course we propose to take in reference to the double competition system. We reply, that beyond suggesting that we consider it should not be adopted for work under 20,000l., we think it is beyond our province to express any opinion.

6. We do not propose to recommend any architect as a professional referee, our duties being confined to sending to promoters of any impending competition the "Suggestions for the Conduct of Architectural Competitions," issued by the Royal Institute of British Architects, and strong recommendations to appoint at once a professional assessor most competent to advise upon the proposed work, and stating the advantages of such a course to the public; and drawing attention at the same time to the list of those who will not compete unless this is done. Any request made to the committee for the appointment of an assessor will be referred back to the promoters, with the suggestion that application be made to

* Certainly not; but the practice referred to appears to be a local one, peculiar to the West of England. We remember noticing such a board before a new building in Exeter, and commented on it at the time.—ED.

the President and Council of the R.I.B.A., or to any well-known architect who would have the confidence of the profession, not necessarily a member of the R.I.B.A., and who is not competing.

This, sir, we think, deals with most of the points that have been raised, and in conclusion we beg to thank you for the great aid you have rendered to this movement, and express a hope that those who have previously signed the memorial, and others who have been waiting to have a further expression of our views, will now, with as little delay as possible, sign the form which has been sent to them, or apply to us for one, which we shall be happy to send, and do whatever else may be in our power.

We may add that we hope to be very materially assisted in our labours by the appointment of local honorary secretaries in all the principal centres throughout the country, many of whom have already agreed to act, and who will place themselves in communication with us, and endeavour in all possible ways to promote the desired reform.

HENRY CURREY, Chairman.

COLE A. ADAMS, } Hon. Secs.
ASTON WEBB, }

RESTORATION AND ANTI-RESTORATION.

SIR,—Does not Mr. Thackeray Turner, in his capacity of secretary to the Society for the Protection of Ancient Buildings, throw a somewhat comical face upon the matter of the St. Alban's altar-screen restoration, by expressing surprise that, as I undertook the work in question, I did not first ask the ninety and five altogether unnoted gentlemen whose names are published as forming the nominal (mind, I say nominal!) committee of the Society whether I ought to be permitted to do so or not?

I have ventured to think the boot fitted better upon another leg; and that what advice was required would be sought for by the other side. It has been so in the days that are passed. It has been my fortune and my pride, from time to time, to carry out work in, or for, more than 1,000 churches; but I have never yet found myself obliged to seek help from the Society. On the other hand, it has applied to me from time to time, and right readily have I afforded any little assistance it has been in my power to render.

As it appears to be the secretary's opinion that it is the bounden duty of a member to blindly fetter himself, I have cleared myself of even a passing suspicion of being enthralled in the fashion he propounds by requesting the removal of my name from the list of members.

HARRY HEMS.

LEAMINGTON SCHOOL BOARD SCHOOLS.

SIR,—In the description of these schools published in your issue of last week (p. 572), we note that the cost of the two schools has been omitted. We should be glad, as competitors, to know the amounts of the accepted tenders, and whether the entire schools are being built. Will you kindly insert this in your next issue, in order that the architects may reply?

ONE OF THE FIRMS WHO COMPETED.

CASE UNDER THE METROPOLITAN BUILDING ACT.

WOODEN STRUCTURES.

On the 23rd ult., at the Lambeth Police Court, before Mr. Biron, Q.C., Mr. Banister Fletcher, district surveyor of West Newington and part of Lambeth, summoned Mr. R. Dudman, of 52, Manor-road, Walworth, for neglecting to give notice of a wooden structure in the rear of his premises.

The defence set up was that the erection was only a small shed used to keep tricycles in, and not a building.

The district surveyor stated that the building was 13 ft. long and 5 ft. 3 in. wide, the roof and two sides being built entirely of wood.

After examining the drawing of the building the magistrate decided that it was a building, and that it was the duty of the district surveyor to require the notice, and made an order for Mr. Dudman to pay a penalty of 10s. and costs.

Books.

Westminster School, Past and Present. By FREDERIC H. FORSHALL. London: Wyman & Sons. 1884.

This bulky volume is an evidence of that curious sort of affection with which "old boys" regard the school in which they have spent, more or less profitably, a few years of early life.

If their own after-career has added nothing to the lustre already attaching to the school's name, they can have the satisfaction of claiming as their own a kind of hereditary share in that lustre. To have been a "distinguished pupil" is something; but to have sat

in the same form with one,—to have fagged for him,—to have been kicked by him,—that is something also. The schoolboy has consolation in the thought—

"Forsan et hunc olim meminisse juvabit."

Probably few except "old Westminsters" will read steadily through Mr. Forshall's book, but for them, at any rate, it affords abundance of palatable food. The personal reminiscences, which occupy the first section, will recall many familiar scenes and forgotten heroes. It depicts the condition of Westminster forty years ago, and has,—perhaps happily,—no parallel among the public schools of the present day. The life was a hard one, but on the whole a healthy one, and the list of great men who, both in modern and in old times, passed through it is long and brilliant. The poets range from "glorious" Dryden to Elkanah Settle; the men of letters include Camden, Locke, Gibbon, and Fronde; and among the men of action there is one—Warren Hastings—whom it would be hard to beat. For more than a century it was quite a nursery of statesmen, and even as late as 1848 there were eight "Westminsters" in the Ministry,—the Premier, Lord John Russell, being one of them. We look in vain through the lists for the name of any architect of great eminence, though the memory of one name honoured in the ranks of the profession is preserved in a peculiar way. At certain irregular banquets held by the seniors in college a cry was common,—*"Bring me a quill."* A "quill" meant a plate whereon to place bones which had been picked, and bore some recondite connexion with some boys of the name, sons of Joseph Gwit, the architect, who were at school in the early part of the century.

As to the school buildings, which form the subjects of five illustrations in Mr. Forshall's book, there is not much to be said. The large schoolroom was part of the old dormitory of the monks of St. Peter's College, and as late as 1799 the walls still exhibited traces of the masonry of Norman or pre-Norman times. The walls were rebuilt in brick in 1814, but the dimensions of the room have been but slightly changed, and are very ample,—length, about 110 ft.; breadth, 32 ft., and height to wall-plate, 24 ft. From this a fine open timber roof rises to a height from the floor of 44 ft. The original dormitory of the Queen's scholars or boarders was the granary of the Monastery erected by Abbot Lillington in 1380; but at the beginning of the eighteenth century it had become somewhat ruinous, and Wren was requested to give a design for a new building. This he seems to have done, but his plan was "revised" by Lord Burlington, an amateur architect of more enthusiasm than ability, and the result has not been a happy one. It is a solid pile of monotonous work, and, however much its Classical style may be in keeping with the studies of its inmates, it is quite out of harmony with its material surroundings. The College hall is fortunately a survival from better times. Originally the private refectory of Abbot Lillington, it has undergone little alteration in the intervening five centuries. A latticed music gallery was added in Queen Elizabeth's time, and until lately the room was warmed by a raised brazier of octagonal shape, which answered its purpose admirably. Mr. Forshall has made diligent use of "Dean Stanley's Memorials" in compiling the historical portion of his volume, and all scholars—whether Westminsters or others—will value the collection of prologues and epilogues which he has made, and which for a century and a half made "the Westminster Play" a link between the past and the present.

A New Subject for Board Schools.—Mr. Paul Q. Karkeek, medical officer of Health for Torquay, suggests in the *Sanitary Record*, in view of the ignorance of the poor in matters relating to sickness and sanitation, that in all schools under Government inspection the elder children should be regularly taught a course of simple lessons on the prominent symptoms of infectious diseases, the dangers to be expected, and how to avoid them; the ways in which infection is spread, and how to prevent it; the common defects in house sanitation, and how to detect them; with the pollution of air, food, and water, and the dangers of damp and overcrowding on the constitution. In short, a simple course of lessons on health, and how to keep it.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

April 18.—6,489, T. Caink, Leigh, Detecting Waste of Water.—6,506, T. Wood, Tunbridge Wells, Cistern-cleaners and Water Waste-preventers.—6,511, G. Greig, Harrogate, Ventilating Apparatus.—6,517, F. Ransome, London, Cement.—6,518, J. Hands, London, Inlaid Tiles for Floor Coverings, &c.
 April 19.—6,537, H. O. Adams, Birmingham, Hearths and Floorings.—6,562, R. F. Bowles, London, Sanitary Stove.—6,564, G. M. Stanfield, Clifton, Corner Clamp.—6,582, J. G. Stadler, Zollikofen, Switzerland, Roofing Tile.—6,589, W. R. Lake, London, Roofing Shingles. Com. by J. Mott, New York, U.S.A.
 April 21.—6,614, H. Pataky, Berlin, Fire-grate. Com. by H. Hempel, Leipzig.
 April 22.—6,632, A. M. Wheeler and W. Warren, London, Dust-shoot for use in Residential Flats.—6,639, J. Mangnall, Manchester, Knobs and their Spindles.—6,656, J. Weller, London, Grates. Com. by A. M. L. Mathioly, l'Isle en Jourdain, France.—6,670, W. R. Lake, London, Valves for Water-closets, &c. Com. by W. Scott, Malden, U.S.A.
 April 23.—6,680, F. W. Hagen, Kingston-upon-Hull, Gully-trap.—6,691, F. W. Hagen, Kingston-upon-Hull, Water-closet Basins.—6,708, F. E. Morris, Colchester, Rack-pulleys for Window-blinds.—6,721, O. Barrett, Leeds, Window-screen-ventilators.—6,727, G. Cuttiburck, London, Water-waste Preventers.—6,732, S. Elliott, Exeter, Glazing Greenhouses, &c.
 April 24.—6,774, T. H. Herberton and R. Pollock, London, Down-cast Ventilator.

SPECIFICATION ACCEPTED.†

April 25.—1,003, H. C. Collyer, London, Supporting and Actuating Venetian Blinds, &c.

NOTICES TO PROCEED

Have been given on the dates first named.

April 25.—6,772, D. R. Clymer, Reading, U.S.A., Construction of Ceilings and Floors of Buildings for facilitating exit therefrom in case of fire (Dec. 18, '83).

April 25.—5,527, J. H. Reynolds, Troy, U.S.A., Ventilators and Chimney-cowls. Com. by A. J. Robinson, Boston, U.S.A. (Nov. 26, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending April 26, 1884.

4,109, J. C. Kent, Bedford, Apparatus for Supplying Disinfectants to Water-closets. (Aug. 24, 1883, price 6d.)

A closed vessel, containing the disinfecting compound, is placed near the basin, and a small pipe leads from the rushing-pipe into this vessel, and another leads from the opposite side of the vessel into the basin. Thus when the flush is effected a small quantity of the water passes through this vessel, absorbing some of the disinfectant.

4,300, A. Skinner and F. J. Rumney, Manchester, Furniture Castors. (Sept. 7, '83, 2d.)

The rim of the oyster has at its lower part a concave shoulder, above which a concave ring is fixed on the leg of the article, and in the space between the two concave surfaces are a series of balls which carry the weight. (Pro. Pro.)

4,305, W. Van Fraugh, London, Apparatus for Cleaning Windows, Walls, &c. (Sept. 7, '83, 2d.)

On the end of a handle is mounted an adjustable frame, in which is secured the cloth or sponge, &c., for cleaning. (Pro. Pro.)

MEETINGS.

SATURDAY, MAY 3.

Architectural Association.—Visit to the Central Technical College, South Kensington. (Mr. Waterhouse, A.R.A., architect.) 3 p.m.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (II.) The Roman Forum. 8 p.m.

Association of Public Sanitary Inspectors.—Discussion of Mr. Rice's paper on "The Public Health Act, 1875, from a Rural Inspector's Point of View." 8 p.m.

Edinburgh Architectural Association.—Visit to Dalhousie Castle and Newbattle Abbey.

MONDAY, MAY 5.

General Conference of Architects.—Opening Meeting. 4 p.m. (For detailed programme see present number of the Builder, p. 625.)

Institution of British Architects.—Fiftieth Annual Meeting (members only). 8 p.m.

Surveyors' Institution.—Discussion on Mr. Chatfield Clarke's paper on "Improved Dwellings for Labourers and Artisans." 8 p.m.

Society of Engineers.—Mr. H. Stopes on "The Engineering of Milling." 7.30 p.m.

Society of Arts.—Mr. J. Norman Lockyer on "Some New Optical Instruments and Arrangements." (Contor Lectures, II.) 8 p.m.

TUESDAY, MAY 6.

Conference of Architects, continued. (See p. 625.)

Institution of Civil Engineers.—Mr. S. B. Boulton on "The Antiseptic Treatment of Timber." 8 p.m.

Society of Biblical Archaeology.—Messrs. Theo. G. Pinches and Ernest A. Budge on "New Texts in the Babylonian Character referring principally to the Restoration of Temples." 8 p.m.

Victoria Institute.—Vice-Chancellor J. W. Dawson, F.R.S., of McGill University, Montreal, on "Prehistoric Man in Egypt and the Lebanon." 8 p.m.

* Compiled by Hart & Co., Patent Agents, 168, Fleet-street.
 † Open to public inspection for two months from the date named.

WEDNESDAY, MAY 7.

Conference of Architects, continued. (See p. 625.)

British Archaeological Association.—Annual meeting. 4.30 p.m.

British Museum (Anglo-Saxon Room).—Mr. J. F. Hodgetts on "Early English or Anglo-Saxon Antiquities." (III.) The Rune. 2 p.m.

Civil and Mechanical Engineers' Society.—General meeting for presentation of report, election of officers, &c. 7 p.m.

Society of Arts.—Mr. C. V. Boys on "Bicycles and Tricycles." (Dr. E. W. Richardson, F.R.S., in the chair.) 8 p.m.

Shorthand Society (55, Chancery Lane).—Mr. Matthias Levy on "Shakespeare and Shorthand." 8 p.m.

THURSDAY, MAY 8.

Conference of Architects, continued. (See p. 625.)

Society of Antiquaries.—(1) Mr. W. M. Wylie on "A Prehistoric Road in Lincolnshire." (2) The Rev. A. W. W. on "A Chalice and Inventory from Hunstanton Church, Norfolk." (3) Lieut. Moore, F.R.S., on "A Supposed British Hearth at Sutton, Suffolk." 8.30 p.m.

Society for the Encouragement of the Fine Arts.—Concert at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 8 p.m.

St. Paul's Ecclesiastical Society.—The Rev. W. Sparrow Simpson on St. Vedast. 7.30 p.m.

Society of Telegraph-Engineers and Electricians.—Mr. Henry C. Mance on "A Method of Eliminating the Effects of Polarisation and Earth Currents from Fault Tests," with Supplementary Remarks and Illustrative Experiments by Mr. Latimer Clark. 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Mr. C. R. Alder Wright, F.R.S., on "Cupro-Ammonium Solution and its Use in Waterproofing Paper and Vegetable Tissues." 8 p.m.

Royal Institution.—Professor Dewar on "Flame and Oxidation." (III.) 3 p.m.

FRIDAY, MAY 9.

Conference of Architects, continued. (See p. 625.)

Institution of Civil Engineers (Students' Meeting).—Mr. A. R. Bennett on "The Electric Light." 7 p.m.

Royal Institution.—Professor Robertson Smith on "Mahomedan Mahdis." 9 p.m.

Society of Arts (Indian Section).—Dr. G. W. Leitner on "Indigenous Education in India." (Sir Lepel Griffin, K.C.S.I., in the chair.) 8 p.m.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (III.) The Palestine Hill. 3 p.m.

SATURDAY, MAY 10.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (III.) The Palestine Hill. 3 p.m.

Miscellanea.

Large Sale of Gas and Water Shares.

Messrs. Fox & Bousfield held an extensive sale of shares in public companies at the Auction Mart, last week, a marked feature of the sale being the decrease in value of shares in the New River Company. The property first submitted consisted of 800 £l. shares in the Northfleet and Greenhithe Gas Company, being a further issue of capital in accordance with the company's Act of Parliament. It was stated in the particulars that the shares would be entitled to a dividend of 7 per cent. as the maximum dividend which the company were allowed to pay. The property was offered in forty lots of twenty shares each, and all the shares were readily purchased at from 126½ to 127½ per lot, being about six guineas per share, or a premium value of a little more than 25 per cent. The next property submitted consisted of New River Company's shares, comprising forty one-hundredth parts of a king's and adventurer's share, together with a few one-hundred-and-twentieth and two-hundredth parts of a share in the same stock; and also twenty-four 1000. new shares. Messrs. Fox & Bousfield have at different periods held sales of the company's shares, and down to last week's sale, the average price realised for the hundredth part of a king's and adventurer's share has been from 950½ to 980½. At the recent sale, however, although there was a large attendance of capitalists, the highest sum obtained was 915½, whilst the larger portion of the lots only realised 800½ and 775½ each. On the 1000. new shares being offered the auctioneer observed that the sum which they had hitherto obtained for these shares was 3800. per share, but at last week's sale the highest sum realised was 3500. per share, whilst most of the lots failed to command more than 3300. each, several lots being sold for 327½ and 328½ per share, showing a decline of about 500. per share as compared with previous sales.

Cyanite.—Captain Shaw, in a letter to the Cyanite Company, says, "I have no doubt that your cyanite would be found most useful in preventing the spread of fire, and I should be glad to see it more generally used on wood, canvas, and other materials in theatres, public buildings, and private houses. I consider that wooden stairs coated with cyanite are, in case of fire, much safer than stone.—I am, sir, your obedient servant, (signed) Eyre M. Shaw."

Lighting.—We understand that the Oratory at Brompton has been lighted by the Sanitary Engineering Company, of Westminster, with the Albo-carbon Light.

The late Mr. James Campbell.—On the 22nd of last month there passed away as he had lived, quietly and unostentatiously, one of the few remaining links of a generation which made for itself not only a name, but added to the greatness of England and the advancement of civilisation throughout the world. We refer to the late Mr. James Campbell, who was for many years an assistant to Mr. George Stephenson, and was taken by the hand by the latter gentleman while working as a common carpenter on the Liverpool and Manchester line; and before many years had passed he was recognised as an engineer of distinction. While engaged with Mr. Stephenson he was employed largely on railways and as a colliery engineer, having charge of varied and extensive works. As resident engineer he had charge of the works of the Ambergate and Rowsley Railway and the Rowsley and Buxton extension of the Midland Railway to Manchester. He it was who undertook the responsibility of carrying a railway tunnel under the Water Tower of the Crystal Palace, and was so far successful in the arduous undertaking that the structure was in no way imperilled, and this after the confident opinion expressed by the leading engineers of the day that the matter was an impossibility. He was for ten years chief engineer to the Staveley Coal and Iron Co., near Chesterfield, and in that position had charge of the extensive works both under and above ground so far as the collieries were concerned. In the year 1876 he retired from active duties, but not to a life of idleness. In the same year, and at the age of seventy-two, he undertook a voyage round the world, and three years later he undertook the responsibility of conducting the first experimental trip of a vessel fitted with freezing machinery for bringing over frozen meat from Australia, viz., the steamer *Strathleven*, the fortunate results of which to this country are now matter of history. For some time his infirmities had to an extent confined him indoors, but always a hard worker and a hard thinker, he was never less busily engaged, and for the last two years he had been engaged as reference engineer by Mr. W. H. Barlow, M.I.C.E., in the construction of the doubling the Belsize Tunnel on the Midland Railway in London. As he had lived so he died, perfectly unassuming, and amongst a large circle of friends his death will be lamented. He was born January 1st, 1804, and had consequently attained his eightieth year.

The Arundel Society.—This society is about to bring out a complete edition of the large illustrated work on Italian Sepulchral Monuments, which has hitherto been sold only in parts, and without the introductory portion. An historical and critical essay, giving a synoptical view of the whole subject, had long been promised by the late Mr. G. E. Street, R.A., but the constant pressure of his professional duties, followed by his untimely death, prevented him from doing more than preparing a collection of notes and rough sketches of monuments as the foundation of his treatise. With the aid of these notes, however, Mr. Perkins, the author of the two well-known works on Tuscan and other Italian sculpture, has now supplied the promised introduction. The entire publication is divided into seven parts, each containing seven plates in permanent photographs from Medieval and Early Renaissance monuments in Italy, chronologically arranged, with descriptive texts from the pen of the photographer, Mr. Stephen Thompson.

The Farnes Museum.—At a meeting of the Council on the 9th inst., Dr. G. V. Poore in the chair, the following gentlemen were elected members.—Right Hon. Sir Charles Dilke, Bart., M.P.; Sir Spencer Wells, Bart.; Sir Thomas Farrer; Sir Henry Thring, K.C.B.; Mr. W. Cornwallis Cartwright, M.P.; Mr. Francis Galton, F.R.S.; Dr. W. Roth, Surg.-Gen. Saxon Army; Mr. Octavius Hansard, F.R.I.B.A.; Mr. Arthur Cates, F.R.I.B.A.; Mr. Chas. Barry, F.S.A.; Dr. Hubert Airey, Dr. C. E. Paget, M.O.H.; Mr. J. Douglass Mathews, F.R.I.B.A.; Mr. Ernest Turner, F.R.I.B.A.; Dr. G. D'Arcy Adams; Mr. Benjamin Baker, C.E.; Mr. Charles Hancock; Mr. Shadworth H. Hodgkin; Mr. A. McMorran; and Mr. Monier Williams. During the past month there have been fifty-one new members elected.

The Cluny Museum.—The celebrated Musée de Cluny is, according to the *Gazette des Architectes*, to be considerably enlarged. The additions will include a hall for a collection of Medieval sculpture. The additions proposed will probably cost about 60,000 francs.

St. George's Mansions, Theobald's-road, Bloomsbury.—The opening out of the new thoroughfare between Hart-street, Bloomsbury, and Shoreditch, has been followed by the erection of several new buildings of a costly character along the line of route. Amongst others are the St. George's Mansions, at the corner of Theobald's-road and Drake-street, near Red Lion-square, which are at present in course of erection by the St. George's Residential and General Building Company. The buildings have a frontage of 70 ft. to Theobald's-road, with a return frontage of similar length in Drake-street. They contain six lofty stories, the two elevations being faced with red and stock brick, and Portland stone and terra-cotta for dressings. The principal elevation is that in Theobald's-road, each floor on the east and west sides of this frontage having bay-windows with Portland stone shafts. The ground-floor and basement, each containing an area of 5,000 ft. are intended to be let for business purposes. The suites of chambers on the upper floors will contain three and four rooms each, fitted with baths, water, and every other convenience. Mr. Worley, of Great James-street, Bedford-row, is the architect, and Messrs. E. Lawrence & Sons, of the City-road, are the contractors.

Sale of a Building Estate at Chiswick. On Friday in last week Mr. Robert Reid offered for sale at the Auction Mart, a freehold building estate, known as Sutton Court Lodge, situated at Chiswick, comprising an old-fashioned detached residence, with pleasure-grounds and gardens, together with 19 acres of grounds. The auctioneer, in introducing the property, pointed out that in consequence of the large number of villa and other residences which were at present being erected in the locality, building land was constantly increasing in value. According to the price which building land in the neighbourhood at present commanded, he estimated the value of the estate at 20,000. The property was submitted in three lots, the first lot offered being Sutton Court Lodge itself, with the pleasure-grounds and meadow-land attached, containing 16 acres. The first offer made was 8,000, and on 10,000, being reached the auctioneer observed that although the sum offered was little more than half its value it would be sold if no further advance was made. By advances of 100l. at each bidding, 10,800, was reached, at which sum the property was sold. A plot of market-garden land attached to the estate, containing one acre, was next offered, and sold for 930l., and another plot, containing two acres, realised 900l., the entire estate producing 12,000l.

Sale of the Guildford Paper Works, Lambeth.—Last week Messrs. Farebrother, Ellis, Clark, & Co. offered for sale at the Auction Mart, by order of the Court of Chancery, the extensive manufacturing premises known as the Guildford Paper Works, situated in Guildford-street, between York-road and Belvidere-road, Lambeth, near to Westminster Bridge. The premises were described as comprising a spacious building of four floors, together with a large foundry, and an extensive range of stabling for thirty-eight horses. The buildings are in the form of a quadrangle, with a large plot of ground in the centre, the whole occupying an area of about 35,000 superficial feet. The property was stated to be held on lease for a term of forty-four years from June, 1879, at a ground-rent of 375l. per annum. The property was submitted at the upset price of 10,000l., which was at once bid, and no advance on this sum being made, it was sold at the price offered.

Civil and Mechanical Engineers' Society.—This society held its annual dinner on Wednesday evening at the Holborn Restaurant, Mr. Twigg, the President, in the chair. In returning thanks for the toast of the President, Mr. Twigg made some excellent and judicious exhortations as to the importance of strict integrity among the profession of engineers, who, as he observed, were entrusted with the expenditure of other people's money to so large an extent. Mr. Fung, of the Chinese embassy, who is a member of the society, in responding, in excellent English, to the toast of "East and West," observed, that while diplomacy, in which he was concerned, "brought Governments together," engineering did more, in that it "brought peoples together,"—a very comprehensive summing-up of the social influence of the profession.

West Bromwich Sewage.—A Local Government inquiry was held at West Bromwich on the 23rd ult., by Mr. J. T. Harrison, M. Inst. C.E., as to an application by the Town Council to borrow 53,100l. for the purpose of carrying out their low level sewerage. The borough surveyor, Mr. J. T. Eayres, Assoc.-M. Inst. C.E., engineer for the works, explained the scheme, and a favourable report is expected. There was no opposition. The main outfall works, in course of construction, are approaching completion.

Watford, Herts.—The Local Board of Watford have instructed Messrs. Bailey Denton, Son, & North, of Whitehall-place, to prepare plans and specification for the sewerage and sewage disposal of New Bushey, Herts., a town increasing in population and within easy reach of the metropolis, but at present without any other means of disposing of its refuse than by cesspools. The works are to be commenced forthwith.

Manfield (Notts.).—Mr. R. Frank Vallance, architect and surveyor, Manfield and Nottingham, has been appointed surveyor to the Manfield Improvement Commissioners. The vacancy was caused by the death of their late surveyor, Mr. B. G. Goodacre, who held office for upwards of twenty years.

Fenny Stratford.—A stained-glass window has been placed in the west end of Fenny Stratford Church as a memorial to the late vicar. The window is of four lights, and contains figures of The Evangelists on a rich grisaille background. Messrs. Warrington & Co., of Fitzroy-square, London, carried out the work.

TENDERS.

For erection of premises at Holborn-circus, E.C. Mr. F. Chambers, architect:—

	Red Mansfield Front.	Portland Stone Front.
Holland & Hannen	£16,420	£15,370
W. Brass	14,960	14,020
Ashby & Huxner	14,993	14,093
J. Greenwood	14,686	13,933
Wagstaff	14,639	13,907
Collis & Son	14,536	13,928
Lawrence & Son	14,459	13,691
E. Conder	14,333	13,844
W. Shurmer	13,986	13,094
J. Grover	13,843	13,094

For bar fittings and counter at the Ship and Billet, East Greenwich, for Messrs. Truman, Hanbury, Buxton, & Co. Messrs. Williams & Son, architects, 2, Ludgate Hill:—
Jackson & Todd £169 10 0 |

Schluter (accepted) 149 0 0 |

Accepted for manufacturing and erecting the gas and steam cooking apparatus, for Messrs. Crisp & Co., drapers, Seven Sisters'-road:—

H. & C. Davis & Co., Camberwell £409 10 0 |

For alterations to the Spread Eagle public-house, Whitecross-street, Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India terrace:—

Staines	£1,106 0 0
Shurmer	1,152 0 0
J. & H. Mills	1,089 0 0
Jackson & Todd	1,069 0 0
Drew & Cadman	1,031 0 0
Tusk	970 0 0

For alterations to the Old Axe public-house, Hackney-road, Messrs. Wilson, Son, & Aldwinckle, architects:—

Shurmer	£830 0 0
Staines	807 0 0
Drew & Cadman	600 0 0
J. & H. Mills	590 0 0
Jackson & Todd	540 0 0
Tusk	490 0 0

For the erection of house at Ealing, for Mr. Thos. Lilley, Mr. J. W. Chapman, architect. Quantities by Messrs. J. V. Goodchild & Son:—

Higgs & Hill	£3,580 0 0
Lawrence	3,436 0 0
Oldrey	3,435 0 0
Pack Bros	3,342 0 0
Adamson	3,325 0 0
Penny	3,220 0 0
Rickett	3,188 0 0
Nye	3,170 0 0

For the erection of house, &c., 31, Seward-street, St. Luke's, for Messrs. Levin Bros. Mr. J. E. Saunders, architect. Quantities by Messrs. Osborn & Russell:—

Clark & Bracey	£1,363 0 0
Little	1,307 0 0
Steel	1,254 0 0
Pack Bros	1,219 0 0
Woodward	1,200 0 0
Richardson	1,198 0 0
Brace	1,181 0 0

For additions to the Cottage Hospital, High Wycombe, Mr. Arthur Vernon, architect:—

Loosley	£209 0 0
Hunt	166 0 0
Harris (accepted)	160 0 0
Lacey	160 0 0

For making and fixing fittings to new post-office, Wellichborough, Mr. E. Sherman, architect. No quantities:—

J. Elder, Hayes	£195 0 0
Kingerlee, Banbury	170 0 0
G. Henson, Wellichborough	142 10 0
J. Underwood, Wellichborough	141 0 0
J. Leete, Wellichborough	138 10 0
Hudson & Stevens, Wellichborough	123 10 0
B. Archer, Northampton	125 0 0

For enlargement of schools at Webber-row, Southwark, for the London School Board. Mr. E. R. Robson, architect:—

Williams & Son	£9,795 0 0
Luthey Bros	9,750 0 0
Bangs	9,745 0 0
Fritchard	9,636 0 0
Shurmer	9,631 0 0
Reading	9,482 0 0
Wood	9,294 0 0
Dowds	9,277 0 0
Kirk & Randall	9,093 0 0
Smith & Sons	9,151 0 0
Marland	9,135 0 0
Hunt	9,093 0 0
Jerrard	9,003 0 0
Touque	9,091 0 0
Holloway	9,043 0 0
W. Oldrey	8,996 0 0
Grover	8,986 0 0
Hart	8,854 0 0
C. Wall	8,701 0 0
Stimpson	8,573 0 0
W. Goodman	8,574 0 0
Wall Bros	8,547 0 0

For making-up Regent, Wellington, and King streets—Kettering, for Local Board. Quantities by the surveyor Mr. R. W. Johnson:—

J. Brown, Northampton	£1,794 15 6
Smith & Co., Leicester	1,652 8 4
G. V. Henson, Kettering	1,416 0 0
J. Underwood, Wellichborough	1,409 4 8
C. F. Henson, Kettering	1,394 15 0
B. W. Ward, Leicester	1,386 7 11
J. C. Neal, Kettering	1,332 0 6
A. Barlow, Kettering	1,276 0 0
N. J. Payne (accepted)	1,214 17 6

For building Harrow-road Mission Hall and House, for the Trustees of the West London Congregational Union, Harrow-road. Mr. Rowland Plumble, architect:—

Butcher	£9,740 0 0
Longmire & Burge	4,590 0 0
Ashby Bros	4,563 0 0
Stanley G. Bird	4,500 0 0
G. Shaw	4,459 0 0
Patman & Fotheringham	4,462 0 0
Goodman	4,389 0 0
E. Nightingale	4,369 0 0
W. Oldrey	4,288 0 0
Holloway	4,100 0 0
Allen & Son	3,500 0 0

For rebuilding premises after fire in Newgate-street, for Messrs. Faudel, Phillips, & Sons. Mr. Thomas Chamberlain, architect:—

R. Conder (accepted at a schedule of prices).
(No competition.)

For building premises in Holywell-street and Wyche-street, for Mr. McSheehan. Messrs. Francis, architects, Falmerton-buildings, E.C.:—

R. Conder (accepted) £3,747 0 0 |

For alterations to the Jane Shore public-house, Shoreditch, Messrs. Wilson, Son, and Aldwinckle, architects:—

G. Lusk	£237 0 0
Staines & Son	239 0 0
J. & H. Mills	266 0 0
Shurmer	234 0 0
Wood	220 0 0

For alterations to the Yorkshire Grey public-house, Whitechapel, Messrs. Wilson, Son, & Aldwinckle, architects:—

Shurmer	£225 0 0
Staines & Son	218 0 0
G. Lusk	199 0 0
J. & H. Mills	199 0 0
Wood	145 0 0

For repairs and decorations at No. 56, West Cromwell-street, South Kensington, for Mrs. Angle. Messrs. Elbette & Cobb, architects:—

R. Perkins	£287 10 0
J. Williamson	283 0 0
H. Baylis	227 0 0
Steel Bros	199 0 0

For erection of new premises at Lower Norwood for the London and County Banking Company, Limited, Mr. Horace Cheston, architect:—

Mortar	£4,929 0 0
T. Rider & Son	4,888 0 0
T. Boyce	4,880 0 0
Bowyer	4,792 0 0
J. Perry	4,738 0 0
W. Shurmer	4,680 0 0
Higgs & Hill	4,678 0 0
Spencer	4,415 0 0
Taylor, Croydon (accepted)	4,290 0 0

For alterations at the Lewisham Bridge Schools, for the London School Board. Mr. E. R. Robson, architect:—

Wood	£3,005 0 0
Larks	2,902 0 0
Outwells	2,873 0 0
Patman & Fotheringham	2,867 0 0
W. Bangs & Co.	2,849 0 0
W. Grover	2,840 0 0
W. Shurmer	2,847 0 0
Goodman	2,833 0 0
Wall Bros	2,826 0 0
Fritchard	2,826 0 0
Atherton & Latts	2,815 0 0
Smith & Son	2,808 0 0
Kirk & Randall	2,800 0 0
S. J. Jerrard	2,779 0 0
E. C. Howell & Son	2,762 0 0
Holloway	2,637 0 0

For alterations and repairs to the Hercules Pillars public-house, Great Queen-street, Long Acre, for Messrs. J. Carter Wood & Co., the Artillery Brewery, Victoria-street, Westminster. Mr. John Calder, architect:—

Mr. E. Edward Crutcheley, Albert Chambers, Victoria-street, Westminster:—	
Falkner	£235 0 0
Arford	375 0 0
King & Son	330 0 0
W. Stilling (accepted)	295 15 0

For the erection of new ragged school and mission house
Fox-court, Gray's Inn-road, Holborn, for the committee.
Mr. George Fagg, architect:—
Borsley £1,475 0 0
Fulman & Tollerkingham 1,353 0 0
Williams & Son 1,327 0 0
Dixon 1,271 0 0
Adamson & Sons 1,181 0 0
Webber 1,087 0 0

For the erection of a pair of semi-detached villas on the
Camden Park Estate, Acton, for Mr. Ainalie Harwood.
Mr. Alfred Wright, architect and surveyor, 180A,
Brompton-road:—
F. Bray £1,700 0 0

For the erection of a block of school buildings and
appurtenances on a site at Plashet-lane, Upton, E. to be
known as the Upton Cross Schools, for the West Ham
School Board. Mr. J. T. Newman, architect, 2, Fen-court,
E.C. Quantities supplied by Messrs. Curtis & Sons:—
D. D. & A. Brown £9,200 0 0
Mages & Co. 9,150 0 0
G. J. Hoskings 9,072 0 0
B. E. Nightingale 9,052 0 0
Joadyna (too late) 8,925 0 0
Heard & Son 8,858 0 0
W. Grear 8,644 0 0
J. Morter 8,475 0 0
A. Reed 8,378 0 0
Holloway 8,380 0 0
J. W. Hobbs 8,029 0 0
Priestley & Gurney 7,922 0 0
J. Brickell 7,900 0 0

For re-seating, &c., St. Nicholas Church, Tooting
Graveney, S.W. Quantities by Mr. E. G. Jarvis:—
Yellow Pine. Red Deal.
J. Howard, Lower Mitcham 2,910 8 0 £744 0 0
G. Proctor, Woolwich 602 12 0 537 4 1
W. Berridge, Lower Norwood 590 9 0 543 18 6
A. Scott, Balham 554 5 0 559 0 0
T. Gregory, Clapham Junction (either £537) 0 0
J. Everal, Great Malvern 530 17 0 543 8 0
J. Elliott, Tooting (either £479) 0 0
F. Smith, Coleman-street, City 411 10 0 421 10 0
W. Robinson, Devoe-road, Tooting 440 0 0 455 0 0
T. Jenkins, Clapham 435 3 0 416 8 0
Higgett & Brown, Earlsfield-road 428 10 0 399 10 0
Oldridge & Son, Kingston Hill (either £423 15s. 6d.) 0 0
Lorden & Son, Upper Tooting 392 9 0 347 9 0
J. Dickenson, Battersea 323 3 0 297 3 0
Pring Bros., Merton (£302 0) 0 0

For certain plastering work to be done at the Imbecile
Schools, Darent, Kent, for the Managers of the Metro-
politan Asylum District. Messrs. A. & C. Harston,
architects, 15, Leadenhall-street:—
Gumbrell £517 0 0
E. Proctor 308 0 0
J. Stride 254 0 0
S. W. Hawkins 238 0 0
C. A. Spencer 227 0 0
J. B. Potter 220 0 0
Wall Bros. 199 0 0
Folham Bros. 198 0 0
D. Barwell 180 0 0
Barter & Bickley 171 0 0
T. Lane 168 0 0
W. Suflee, Gravesend (accepted) 138 0 0

For road-making, bridge work, and fencing to the roads
of Long Reach Marshes, for the Managers of the Metro-
politan Asylum District. Messrs. A. & C. Harston,
architects, 15, Leadenhall-street:—
R. B. Stephens £5,348 0 0
Bottoms Bros. 3,500 0 0
Wall Bros. 3,175 0 0
S. Chafen 3,140 0 0
G. Roots 3,125 0 0
R. & E. Evans 2,274 0 0
Hubbard & Ellingham 1,892 0 0
Cooke & Co. 1,882 0 0
Killingback 1,872 0 0
Beadle Bros., Erith (accepted) 1,668 0 0

For the erection of a boundary wall at the site of
Convalescent Hospital, Gore Farm, Darent, for the
Managers of the Metropolitan Asylums District. Messrs.
A. & C. Harston, architects, 15, Leadenhall-street:—
Nightingale £1,835 0 0
Bottoms Bros. 1,735 0 0
Rowland Bros. 1,600 0 0
Wall Bros. 1,380 8 8
Beadle Bros., Erith (accepted) 1,376 0 0

For continuation of Park-road and constructing two 6 ft.
brick culverts and bridges and diverting portion of Fynn's
Brook, for the British Land Company, Limited, on their
Estate at East Barnet. Mr. Henry B. Michell, sur-
veyor:—
Newell & Robson, Kensington £2,550 0 0
C. Killingback, Camden Town 2,500 0 0
F. W. Keeble, Regent's Park 2,468 0 0
T. G. Dunmore, Hornsey 2,399 0 0
J. Bloodfield, Tottenham 2,376 0 0
W. Harris, Camberwell 2,373 0 0
J. Pizey, Hornsey 2,357 0 0
J. Jackson, Leyton 2,345 0 0
F. Wilson, Walthamstow 2,128 0 0
Peall & Sons, Bromley Common, Kent 2,098 0 0

For new house to be erected at Newmarket for Mr. Jno.
Platman, architect:—
Simpson & Son £698 0 0
Smith 690 0 0
King 688 0 0
Denon 650 10 0
Kerridge & Shaw (accepted) 647 0 0

For the erection of a house and offices, to be known as
Camp Hill, at Emery Down, near Lyndhurst, Hampshire,
for Major Ward Jackson, Mr. W. H. Mitchell, architect,
Southampton:—
Dyer & Sons, Southampton £1,988 0 0
J. Crook, Southampton 1,844 0 0
Stevens & Sons, Southampton 1,820 0 0
Hayter, Lyndhurst 1,814 0 0
H. J. Sander, Southampton 1,793 0 0
Fayre Bros., Lyndhurst 1,763 9 0
J. W. Rowland, Southampton 1,841 0 0

For alterations and additions at 1, Great Queen-street,
Westminster, for Mr. C. Windle. Mr. J. H. Davies,
architect, 1, Great Queen-street, Westminster:—
J. King £73 15 0
R. Braley 54 0 0
J. Smith 52 0 0
A. Pemberton 45 0 0

For new schoolroom and additions to Westmoor Villa,
Hereford. Mr. W. W. Robinson, architect, Hereford:—
W. Bowers & Co., Hereford £890 0 0
Beston & Hodges, Hereford 880 0 0
W. Cullis, Hereford (accepted) 680 0 0

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The Builder.

VOL. XLVI. No 2127.

SATURDAY, MAY 10, 1884

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What the Architect Does for the Country.

O endeavour to assign a definite value to the services rendered to the country by the architect may well be thought, at first sight, a fanciful, if not an impossible, speculation. Nevertheless there do exist statistics which throw strong light on the subject.

We must, in the first place, exclude, as not capable of numeric valuation, any reference to the ennobling functions of art, to the moral and educational effect produced on a people by the silent teaching of the monuments of the past, or of the splendour, elegance, or comfort of contemporary architecture. No calculus has yet been invented by which the value of these functions can be determined. But it is otherwise when we regard architecture from a lower, though still a very truthful, standpoint. From this materialistic point of view the function of the architect is to provide for the housing and shelter of the people; to provide for it, that is to say, as far as regards design, arrangement, and superintendence of execution. As to this, the third volume of the Census of England and Wales for 1881 furnishes a certain amount of information, to the analysis and arrangement of which a short time may be devoted with some utility, we hope, to the public service of the country.

Out of the 26 millions of inhabitants of England and Wales in 1881 (accurately speaking 25,974,439 on the day of enumeration), 43·10 per cent., or 11,187,564 persons, are returned as workers, either by head, hands, or both. They are arranged under five classes, and a proportionate number of orders and sub-orders. The balance, called the "indefinite and non-productive class," consists to the amount of 67 per cent. of females. A portion, 10½ per cent., consists of males under five

years of age; and, if we were to extend this latter category up to the age of fifteen, the 10½ would be raised to 35 per cent., accounting, in this division alone, for a large proportion of the non-workers. Thus, roundly speaking, the whole male population of the country above fifteen years of age may be regarded as occupied either in professional, commercial, manufacturing, or agricultural industry; the male non-workers among the total number of the population being replaced in the category of toil by workers of the female sex.

Of these 11½ millions, nearly, of working bees, the persons directly occupied in providing for the housing of the people form the respectable proportion of 7·3 per cent. But to the 786,660 persons who are enumerated in the census as "working and dealing in houses, furniture, and decorations," a further and very large contingent must be added from industries distributed under different heads. Thus the 28,870 quarriers in stone must be chiefly engaged in preparing materials for the mason and for the builder; and out of the 559,769 general labourers a large proportion must get their living out of building operations. If we consider the number of those unspecified workmen to equal that of the regular tradesmen, even without attempting to assign the proportion of the 663,263 persons engaged in conveyance who are occupied with the carriage of building materials, we shall have a total of nearly 1,600,000 souls, or rather more than one-seventh of the industrial population of the country engaged in the building trade. In this number, moreover, are not included those workers in mines and in metals whose labour is a necessary preliminary to that of the locksmiths, fitters, and furniture makers, who are returned under those special heads.

This great army of workmen is under the control of 6,898 architects, independently of any aid that the latter (who are classified as "artists") may receive from 5,394 land, house, and ship surveyors, or from 7,124 civil engineers. This allows an architect to superintend about 230 workmen, independently, as before said, of carriers and of workers in the primary stages of products that are subsequently perfected as house fittings. If we link the surveyors with the architects, we obtain upwards of 13,000 persons engaged in architectural design and superintendence, being equal in numbers to about one-fourth of the clerical

profession, one-third of the legal profession, and one-fifth of the medical profession.

According to statistical returns, the increase in the value of house property, between 1840 and 1880, was 1,371,000,000*l.*, or at the rate of 34,275,000*l.* per year. This does not allow of the expenditure of much more than 2,600*l.* under the direction of each architect and surveyor per year for new buildings; 5 per cent. on which does not produce a very lucrative income. But draughtsmen and pupils are, no doubt, included in the census returns, which goes some way to redress the balance. And if we regard the architect not merely as engaged in providing for new buildings, but as exerting a certain care and control over the general problem of the housing of the people, we find that each of the professional men above indicated has, on an average, to attend to the housing of two thousand persons. On the same broad average, a medical man is required for every 4,000 persons; a clergyman for every 5,000; and a lawyer for every 6,000. We must bear in mind the double function of the architect, as affecting at the same time production and maintenance, to account for the higher rate of demand that is thus made on his service, per 1,000 of the population, than in the case of the other professions cited. The civil engineers are somewhat more numerous than the architects, the respective numbers being 7,124 of the former to 6,898 of the latter. But the annual increase of one part of the work of the civil engineer alone, viz., railways, has been at the rate of nearly 18,000,000*l.* per annum, or half the increase of the value of buildings; while the vast interests connected with mines, ironworks, collieries, stationary engines, and machinery of all sorts, afford employment for the profession of the engineer, of which the civil is not distinguished in the census from the mechanical branch. Of mining engineers the number is 2,231.

Chief in numeric importance of the brigades of the great army of industry, with reference to the housing of the people, are the carpenters and joiners, who amount to no fewer than 235,017, or nearly one in fifty of the whole of the industrial population of the country. Bricklayers are only about half as numerous, counting 125,055; and masons follow hard after, being 97,432 in number. The craft which comes next in importance, being, indeed, more numerous than the masons, are the

painters and glaziers, of whom there are 99,676. Plasterers and plumbers together make up 65,960; the total of these trades, together with builders, slaters, tilers, and paperhangers being 666,738. Furniture and fittings occupy 101,066 persons; and house-decorators, 18,856,—making in all 786,660 persons returned as “working and dealing in houses, furniture, and decorations.” The persons engaged in agriculture—who are 1,278,624; the miners and mineral workers, 1,277,592; the workers in textile fabrics, 1,053,648; and the persons engaged in conveyance, 663,263—approach in numeric importance the building trades. The persons working and dealing in machines and implements, who are 267,976, are fewer in proportion than might have been anticipated. The persons working and dealing in food and lodging approach pretty closely to those occupied with houses and furniture, being 629,371. The persons working and dealing in dress (who are distinguished from the workers and dealers in textile fabrics) are 981,105. Thus, as far as can be gathered from the numbers of persons employed, dress costs considerably more than housing, while food requires for its provision as many persons as are engaged in the united industries of building, textile work, and dress, all taken together.

The largest group of all those into which the population is divided, is what is called the domestic class, if it is compared with any divisions of occupation of similarly distinct character. Grouped together as a whole, indeed, the occupations ranked under the head of the industrial class engage nearly one-fourth of the entire population, of which what is called the “indefinite and non-productive class,” before referred to, form 56·90 per cent. The primary divisions given in the Census may be thus comparatively stated:

	Per cent.
1. Professional class	2·50
2. Domestic class	6·94
3. Commercial class	3·77
4. Agricultural class	5·36
5. Industrial class	24·53
6. Indefinite and non-productive class	56·90
	100·00

The very small proportionate percentage of the agricultural class is one of the most striking features of this *conspectus*. In 1831, according to the statement of Sir Robert Kane, in his work entitled “The Industrial Resources of Ireland,” the respective proportions of the population were:—

	Great Britain.	Ireland.
Employed in agriculture	28·2	65·7
Employed in trades and manufactures	42·0	17·4
Employed otherwise	29·8	16·9

In 1871 the number of persons employed in agriculture in England and Wales was 1,561,024, including gardeners and persons occupied about animals. In 1881 the corresponding numbers, instead of being some 10 per cent. more, had fallen to 1,383,184, a decline of 177,840 persons, or more than 11 per cent. in actual numbers, coming down, as above shown, to only 5·36 per cent. of the entire population. Thus the persons occupied in the building industry now outnumber, by between 10 and 12 per cent., the roll of those on whom, but for the ministry of commerce, we should have to depend for the provision of the food of the entire population.

Another special peculiarity of the work of the architect and of the trade of the builder, is thus forced upon our attention. This is its permanence; permanence, that is to say, so long as any particular stage of civilisation is permanent. Domestic architecture is thus at once the outcome and the measure of the national wealth, using the fine old English word in its true meaning of well-fare. With stable institutions, the annual increment in the numbers of a nation requires proportionately a somewhat larger increase in the provision for housing. An addition of a number of cubic feet of house-room exactly proportionate to the increase in the numbers of the people may be said rarely, if ever, to occur. There will be either a gradual

increase in the size, beauty, and architectural excellence of the architecture of a people, or, *per contra*, a decline. A sense of order and security, and the practice of lucrative industry, become permanently reflected in stone and brick, among one race, at a time when, within a few hours of travel, the abodes of another race, more ancient, it may be, in civilisation, as well as more gifted by nature with many of her noblest endowments, are degenerating into ruinous hovels. Eminently is architecture sensitive to the true law of civilisation. Very slightly is structural progress or decline affected by the great panacea of the half-taught *doctrinaire* of modern times, viz., legislation. It is not within the power of votes, given either at the hustings or in Parliament, to effect much for architecture, unless it be such a legislation as waits upon national requirement, or as stands as a sentry to prevent the permanent injury of urban growth by the overhaste to grow rich. Legislation cannot enforce taste, any more than it can create wealth; and it may be said without any hesitation that it is rather by increasing to the utmost the sense of security and unpaired calm, than by the effecting of any manner of change, that the statesman will make any mark save a disastrous one on the contemporary architecture of a country.

Statistics are, too often, and for too many people, a dreary and forbidding province, alive with painful recollections of the never wholly mastered multiplication table. But statistics, in the hand of a master, are instinct with a romance of their own. Apart, however, from that, their value, as substituting a definite for a vague conception, is of a very high order. Is there not a difference between such general statements as,—“there can be no doubt that the building trade is a very important member of the commercial and industrial interests of the country,”—and the statement that, week after week, its operation is crystallising some 700,000l. worth of labour in the form of houses and monuments, churches and halls, markets and shops, docks and harbours? And when we add the engineering works, this process goes on at the rate of considerably more than a million a week. That is a definite measure of the importance of the building craft.

No less instructive is the reflection that, counting by months, there is a larger demand for the products of industry made by the non-working than by the working portion of the population. It is, indeed, consistent with the old ideas of the order of society that such should be the case. Take it how we like, while the number of the truly idle who are capable of work must be very small, the number of women and children who are returned under one or another of the productive classes is unduly large. In the East, and we conclude in the savage life of the West and of the South, the men are reckoned as one-fifth of the population. It is true that much of the drudgery of domestic life is thrown upon the women, in such cases. It is the women who draw water, who grind corn, who tend the young, who discharge, to a considerable extent, the functions usually performed, among the nations of Western Europe, by beasts of burden. But for what is regarded as the occupation of men,—fighting, hunting, and whatever humble attempts at agriculture may be added to pastoral occupations,—the men are needed. In savage life, then,—to which some persons hold that we are on our way back,—the working population of England would form 20 instead of 43 per cent. of the population. The resulting 23 per cent. shows the extra resources that civilisation affords to national industry.

Another reflection follows from the consideration of the preceding figures. It is one to which a more minute dissection of them gives a greater significance. That is, the intimate dependence of public welfare, and of the happiness of the masses, on peace, security, and absence of harass and of menace. Among the industrial classes,—those who minister to wealth and luxury alone,—jewellers, goldsmiths, dealers in feathers and fur, in silks and satins, in linen and lawn and cambric, are comparatively few. If we add

poulterers, and fishmongers, and confectioners, and wine merchants, and those who serve the tables, or the stables, or the homes of the wealthy and easy classes, we still do not reach more than, perhaps, 5 per cent. of the industrial classes. On the other hand, those whose services are absolutely necessary to life,—bakers, butchers, brewers (shall we say?)—are not much more numerous. The food industries are only credited with 514,000 persons engaged in these various processes. It results that the great mass of the working population follow callings of which the prosperity depends on the public sense of security. The man who is ready to lay out a large sum of money in building a house, will put it off till next year if he finds that strikes are likely to occur in the building trade. So it is with everything of which the execution is not limited to time. When times look bright, not a day is to be lost; when they look dull,—wait till next week, next month, next year. But every week's delay means a pinch to so many families. Here to us is the great lesson of the Census,—the dependence of public welfare on public order, security, and content.

Hence it is that when war, or pestilence, or domestic commotion disturbs the order of the State, the industrious classes are the first to suffer. To regard closely the nature of the occupations of the industrious classes is enough to “teach the act of order to a peopled kingdom.” Only when this is maintained do “merchants venture trade abroad”; only then do our great urban hives teem with “the singing masons building roofs of gold, The civil citizens kneading up the honey, The poor mechanic porters crowding in their heavy burdens at the narrow gate.” So only “may a thousand actions, once afoot, End in one purpose, and be all well borne, Without defeat.”

THE ROYAL ACADEMY.

THE Academy Exhibition of 1884 is one of considerable and varied interest. The painting, however, which is admittedly the central work of the year, the President's “Cymon and Iphigenia” (276) just fails to command that consensus of admiration which is aroused only by a complete and unquestionable success. After looking through the illustrated pamphlet on the making of the picture to which we referred the other day, the result is a trifle disappointing. The original model of the figure of Cymon, as engraved, conveyed well the idea of a commonplace youth suddenly taking in a new idea of what beauty meant; but the Cymon of the painting is a sentimental youth, not at all answering to the poet's description, and he is in part awkwardly hidden behind the sleeping figures on the right, which would in any case impair the expressiveness of pose of the original model. Iphigenia is a fine figure, in very deep sleep, and this expression of deep sleep is intensified by the attitudes of the attendant figures, who are really the most thoroughly successful portion of the work. The swell of the hip of the principal figure is surely exaggerated beyond nature, certainly beyond the requirement of beauty. The prevalent tones of the figures and drapery are exquisitely harmonious, though hardly those of any possible open-air scene; this one can allow for, as Sir F. Leighton's art is essentially ideal, not realistic; but a tree at any rate must be a real tree, and these trees are very much like scenic trees. The artist has, however, raised the subject above the vulgarity with which it has often been treated; he has aimed at giving the hallowing influence of intellectual beauty, instead of painting a satyr leering at a naked figure; and for this let him have much thanks.

The work which most completely fulfils its aim in this exhibition is again Mr. Orchardson's. “Mariage de Convenience” (341) is a moral painting which in its almost cruel satiric force reminds one of Hogarth, though in a different enough manner. Much canvas is covered, for a scene with only two figures, and we like no more than before Mr. Orchardson's peculiar prevailing tone; the two opposed figures, the prematurely old and *blasi* husband

and the young, full-blown and sensual wife, are most brilliantly and pitilessly contrasted; a contrast intensified by the solid propriety of the butler, who pours out the wine which neither cares to touch, in well-acted unconsciousness of the situation. The painting represents about the worst phase of the evil it satirises; the two personages are about equally unworthy of sympathy; but if we look at painting as a means of pointing a moral, this must be recorded as a work of exceptional success.

Mr. Millais's principal contribution seems like two separate paintings combined in one frame. It is entitled "An Idyll, 1745" (347), and represents a drummer boy in the English uniform of the period playing the fife to a small audience of three Scotch girls, seated in a nook in a wood. On the left is the mass of red and white uniform of the player, painted with almost raw realism, on the right the figures of the listeners seem to be under another light, while the sentimental expression of their faces is in the strongest contrast to the matter-of-fact countenance of the player. This part of the contrast is of course natural and effective, but seems to be an absolute want of relation between the component parts of the work which renders it as a whole rather perplexing and irritating, and suggests the idea that the military musician was painted first as a special study, with no original reference to what was to be added to the composition subsequently. Mr. Millais's portrait of Mr. Henry Irving (372), painted for presentation by the artist to the Garrick Club, will form a notable addition to the collection of historically interesting, but in many cases artistically feeble, theatrical portraits which adorn the club. It is a side face, half-length, very refined in execution and character; perhaps a trifle flattering. A more powerful portrait, in Mr. Millais's most downright style of realistic portraiture, is that of Mr. Fleetwood Wilson. Besides these, this artist only exhibits one other work, the portrait of "Miss Scott" (331), a Philadelphia lady.

Mr. Seymour Lucas, who is one of the three painters who have been "purchased under the terms of the Chantry bequest," has painted nothing better than "After Culloden" (881), a scene in a smith's shop, where, on the left, an English officer and his party enter, and the sturdy inhabitants seem disposed to resent the intrusion with the weapons of their trade. The man who, to the right, faces the military party, is really grand in his character and pose, and yet not out of keeping with his surroundings. A gaily-caparisoned horse, tethered on the right, indicates that his rider, of whom the soldiers are in search, is not far off. On the same wall, in Gallery VIII., are two other military scenes, the "Wallenstein" of Mr. Crofts (873), and "The Guards at Tel-el-Kebir," by Mr. Woodville (866). The latter interests us not at all. In the former Mr. Crofts has repeated a *motif* in composition which he has used rather regularly, the principal figure riding up to the front amid an array of soldiers and other lookers-on. Mr. Crofts was wonderfully successful in his treatment of Marlborough in this way two or three years ago; the principal figure asserted itself as "the man." We can hardly think he has equally realised Wallenstein. The figure on horseback, taciturn and self-controlled as he seems, is too trim and quiet-looking for that brilliant, unscrupulous, and, in some respects, brutal military adventurer. For another very striking battle-picture we may go back to Gallery III. and look at Sir John Gilbert's picture of "The Morning of the Battle of Agincourt" (258), a remarkable study of the conditions depicted in Shakespeare's well-known lines.

Mr. Tadema's large work, the largest, we think, he ever painted, "Hadrian in England" (245), represents a supposed visit of this Emperor to a Romano-British pottery. The picture is oddly composed, and repeats a frequently-employed receipt of the artist, of bringing in a figure close to the spectator, in movement from one portion of the scene to the other. In this case it is an "operative" carrying specimens up a stair; on a kind of gallery

above are Hadrian and his suite, the Emperor a little milder and more effeminate in appearance than the busts of him seem to justify; below we see, under the stairs, the *atelier*, the men and women in which appear a little like dolls, from want of atmospheric perspective to give them scale and distance. The brilliancy and realism of the costumes and accessories are as usual in Mr. Tadema's work; and, to say truth, it requires all this to carry off the awkward composition, or want of composition, of the whole. In the same room is Mr. Pettie's "The Vigil" (359), a painting of a Mediaeval knight watching in the church the night before taking his vows. He holds his sword aloft before the shrine, kneeling on the pavement of the empty moonlit cathedral; the expression is as far earnest as Mr. Pettie can be earnest; the amount of canvas expended over the church, the architecture of which is poor and poorly painted, is very disproportionate. This picture has been bought with the Chantry funds; we will not say undeservedly, but it is a work of rather high aim which falls short of its aim. Whether this is better than having a low aim and fulfilling it, let the philosophers settle. Of Mr. Pettie's other large work, "The Site of an Early Christian Altar" (410), the less said the better.

Mr. J. W. Waterhouse has made a real success in "Consulting the Oracle" (559), where a female priestess leans nervously down towards the mouth of a human head suspended on the wall, watched by a circle of equally nervous women, within a dimly-lighted room. It is difficult to settle what is the intended locality or nationality, nor is this of importance to the effect of the work. The picture is one which would hardly have been painted had not Mr. Tadema gone before; but it is no mere imitation of his style, and it may be welcomed as marking a success which has been achieved by patient and conscientious work, improving every year. "Sand Digging, North Cornwall" (916), by the same artist, shows that he has no mind to confine himself to one manner or one class of subject in painting.

Mr. Poynter has probably been too busy with his work for St. Paul's to send large paintings to the Academy; his "Diadumene" (368) is a very pretty, refined little nude study, framed in the midst of an interesting architectural scene, reproducing among other things some mosaic-covered columns of unusual design, for which data, we believe, exist. Mr. Calderon's decorative panels, "Cherries" and "Currants" (462, 588), for a dining-room, representing damsels picking those fruits, are neither the one thing nor the other, neither decorative nor pictorial. Among the painters of ideal and what may be called classical subjects of this kind, Mr. Albert Moore, on the other hand, knows exactly what he means to do; his "Reading Aloud" (416) is purely decorative, exquisitely so; there is hardly a trace of special expression, it is true, in the faces of the three figures, but in line and grouping, in colour and design of accessories, they form something so harmonious to the eye as to be a positive pleasure. Smaller replicas of two of the figures are in the Grosvenor Gallery and the society of water-colour artists. This is not an art which appeals to the emotions; it is superficial intellectually; but it is perfect as far as it goes, and therein lies its charm. Other figure pictures, as well as landscape and sculpture, we must return to at another time.

NOTES.

NEXT week, we understand, Lord Stratheden and Campbell will bring forward a motion in the House of Lords for the appointment of either a Royal Commission or a Parliamentary Committee to inquire into the subject of smoke abatement or prevention, and to take evidence as to the best means, scientific and legal, whereby the production of smoke may either be prevented or materially diminished. The main object is to bring what may be called "domestic smoke" under the same legislative control as smoke from mills and manufactories, or, at all events, to put the producer of such smoke under the dilemma of having either to

prevent smoke or to pay for the privilege of producing it. There is little doubt that public opinion is now in a state to favour legislation on the subject, provided a sufficient body of scientific evidence is collected which will satisfy the public that the end is practically attainable. In this respect the proposed Committee or Commission of Inquiry will supply the means of condensing into one concise body of evidence the extensive and varied information on the subject already in existence, and will form what may be termed the necessary bridge to legislation. The possible methods of dealing with the subject may be grouped under two heads, viz., special fuel, or special grates or appliances. The former principle would be less complicated, probably, in its working, and more equitable in its incidence on rich and poor, though there would be considerable initial difficulties in relation to vested interests. The adoption of special grates or mechanical regulators of air supply, &c., is more easy to initiate, but would present formidable difficulties in detail, especially as regards the poorer districts of London, in regard to the large total of expenditure which would be necessary to provide for carrying it out. We have no doubt, however, that once the practical possibility of having smokeless fires is demonstrated unmistakably to the public mind, the legislative difficulties will be surmounted.

THE new Archaeological Museum at Cambridge, in connexion with the Fitzwilliam Museum, was opened on the 6th. Among those present were the Vice-Chancellor, who presided, Sir F. Leighton, Mr. Russell Lowell, Mr. E. A. Freeman, Mr. Burton, Prof. Sydney Colvin, &c. Mr. Lowell, in a speech marked by his usual happiness of manner and matter, suggested the possibility that, mixed race as we were, the opening of such a museum in Cambridge would stir in some one an ancestral vigour, some hereditary quality or faculty which should make him into an artist. We gave an account of the building (of which Mr. Basil Champneys is the architect) and of its origin and intent some little time back (*Builder*, Dec. 1, 1883), and shall shortly give some illustrations of the interior, showing part of the arrangement of the casts. As a collection of comparative sculpture the gallery stands quite alone in England, and is only excelled by that of Berlin. The building is an exceedingly simple one, the object being to provide house-room for the casts and antiquities, and for a lecture-room and library, &c. with strict regard to economy, and therefore little could be done in the way of architectural effect. The collection of casts, of which we shall have more to say, was got together mainly under the supervision of Professor Colvin, the retiring curator, and this portion of the establishment is now under the care of Dr. Waldstein, who succeeded Professor Colvin in his office of curator to the Fitzwilliam Museum, of which the sculpture gallery is a dependency. The general and local archaeology is under the charge of Baron von Hügel.

In the Supplement to the *Builder* which we give this week will be found full reports of the proceedings of the seventh General Congress of Architects, which was opened on Monday afternoon, when Mr. Horace Jones, the retiring President of the Royal Institute of British Architects, received the members and visitors attending the Conference. The real beginning of the business of the Conference was deferred to Tuesday evening, when there was a rather thin attendance to hear Mr. Cates's paper on "The Relations between Architect and Contractor." The paper, though embodying much interesting information, led to a discussion chiefly in one direction, and little that was new was elicited. The languor of the debate was appreciably relieved by the lively speech of Mr. Chas. Lucas, of Paris. The Conference met again on Wednesday morning, when there was a much larger attendance to hear Mr. Blashill's able paper on "The Tenure of Land for Building Purposes," which was followed by a very good debate. The special meeting of Associates, held in the afternoon, to consider

questions affecting the position and privileges of that important section of Institute Members, was crowded, enthusiastic, and unanimous; and while some speakers indulged in a little banter of the "archaic" provisions of the Charter, there was, we were glad to note, an exceedingly healthy tone of loyalty to the Institute pervading the meeting. Some of the foremost speakers in favour of the reforms proposed urged that while reasonable concessions to the Associates would be to the advantage of the Associates, they would be far more advantageous to the Institute, as tending to "solidarity" and *esprit de corps*. More than one speaker was heartily cheered as he referred, in terms of unequivocal deprecation, to the proposal for the establishment of a new architectural society, and the only reference to the proposal which was not in deprecation of it was received with chilling silence.

Or the drawings which have been exhibited in the ground-floor room at Conduit-street this week, those by Street are the most instructive in regard to the production of clear intelligible detail drawings, and in regard to the realisation of the spirit of Gothic architecture by the modern architect, or by those who still hold to that as the highest aim of modern architecture. Burges's drawings are deficient in clearness and intention, in comparison with Street's, and there is a vein of eccentricity and oddity about some of the sketches, which, however "spirited," as the phrase goes, are not such as can be held up as models. In this respect, Viollet-le-Duc's sketches are quite above the others; they represent exactly what architectural sketching of details should be: clear and concise representation without labour, and by broad and well-defined handling. Taken generally, there is more of modern applicability in the Viollet-le-Duc drawings than in those of the two English architects. Viollet-le-Duc was an exceptional example of a man who ardently studied Mediaeval art without becoming a Mediaevalist. His detail designs represent a great deal of Mediaeval excellence translated into his own forms. Some of the wrought-iron details, if compared with those among Street's "Law Courts" details, show to decided advantage; they are more original and designed with more freedom of line. In some of the geometrical drawings for large works, however, Street is shown at his very best, as well as in his many details, mouldings, &c. There is a good example of what we mentioned in an article written at the time of his decease, his habit of drawing the mouldings for all the caps of the piers of a church on one sheet of paper, all alike in general dimension, but all slightly varied in detail. This one sheet is quite a study for the young student in the designing of mouldings.

It is not, however, quite fortunate, considering the present condition of public opinion in regard to architects and architecture, that so much should have been said at the Conference meeting on Wednesday, in honour of the uncompromising Mediaevalism of Street and Burges. Unless architects are prepared to regard architecture more from the point of view of to-day, they will be more and more left behind or on one side by public opinion, not altogether that of the "Philistine." Mr. Beresford Hope, with the natural partiality of a warm friend of the late architect of the Law Courts, spoke of Street's uncompromising adherence to his Mediaeval architectural faith as peculiarly honourable to him. Adherence to convictions is always honourable to a man's principles, but not necessarily to his judgment. Critics of another school would perhaps say, and not without reason, that Street had been consistently blind to the use, spirit, and requirements of the age and the purposes for which he was building, and we must entirely demur to the dictum of Sir Gilbert Scott, quoted by Mr. Aitchison in reference to Burges, that "an able artistic architect can surely make a good plan, while no amount of skill in mere planning can, in itself, enable a man to produce a noble building." The latter part of the sentence is perfectly true; but as to the former, though

one cannot prove a negative theoretically, the fact remains that those who are called artistic architects very often have not made good plans; whether from indifference or incapacity one cannot predicate, but the result is equally inconvenient either way, for those who have to live in or make use of the buildings.

At this juncture, when the Conference of Architects is engaging the attention of our readers, it may be of interest to mention the following particulars of the first meeting of the Institute. It was on Thursday, the 8th May, 1884, that Professor Donaldson addressed a circular letter to several well-known architects, inviting them to attend "at Mr. Rainey's rooms," 14, Regent-street, on Tuesday evening, the 13th May, 1884, and at that foundation meeting fourteen attended, namely:—Messrs. P. F. Robinson (in the chair), Seward, Kay, Barry, Gwill, Lee, Cresy, Fowler, Parker, Kendall, Bellamy, Goldcutt, Rhodes, and Donaldson,—the order of precedence here given being that recorded in the minutes. The first annual meeting was held on Monday, 4th May, 1885, when twenty-three fellows and five associates were present, including Sir Charles Barry, J. B. Papworth, Decimus Burton, and others, of whom Professor Donaldson is the sole survivor.

The first stone of the restoration work at Peterborough Cathedral was laid on Wednesday, the Earl of Carnarvon officiating as pro-Grand Master of the Freemasons, in place of the Prince of Wales, who was to have laid the stone. There was a "special Grand Lodge" formed at the Fitzwilliam Hall, and a procession thence to the cathedral. After the ceremony, which did not differ in its formalities from most others of a similar nature, a luncheon was provided in a tent near to Fitzwilliam Hall. As elsewhere notified, we shall give next week a measured drawing of one bay of the cathedral arcade, showing the deviation from plumb and the means taken for bandaging up the pier; and we shall also be able to give a plan of one of the piers as built, showing the extraordinary style of jerry-building which might be carried on in a great structure in (to adapt a well-known Hibernianism) "the so-called Middle Ages."

We are recognising more and more the need of providing open spaces for those who are compelled to live within our ever-growing cities. In time, perhaps, we shall also learn how best to utilise our few surviving gardens and disused burial-grounds. One consideration seems to have been overlooked in dealing with open spaces, and that is the fickleness and often the inclemency of our climate, and thus the use of such places for air and exercise is very much restricted. Why could we not have in our parks some adaptation of the Italian piazza or colonnade, for we are quite as much in want of shelter from rain and wind as the southerners are from sunshine? Such buildings, besides providing suitable protection for men, women, and children in bad weather, would be the proper home for the bare-headed statues whose forlorn condition in the streets and squares of London often moves our compassion. There would be abundant opportunities for skilful design and appropriate decoration, and there are plenty of architects in the present day who might be trusted to give us something better than the refreshment-bars of a suburban tea-garden. Again, by applying a slightly different treatment to disused burial-grounds, we should not only render them more useful and attractive, but we should also be able to dispose of a valid objection often urged against the present mode of treating the memorials of the dead. It must be admitted that the ordinary headstone,—cold, angular, and grim,—does not harmonise with its new surroundings, and hence,—in defiance of justice and the Society of Antiquaries, it is not unfrequently buried or ruthlessly carted away. But nothing could be simpler than to transfer the records of the graveyard to the walls of the cloister, and thus secure for them a far more extended existence. They could be arranged alphabetically or chronologically, as might seem most expedient,

and Old Mortality could study them in sunshine or in storm without experiencing any of those difficulties by which he is now beset. If at Stepney or Whitechapel we had a humble imitation of the Pisan *Campo Santo*, would it necessarily be profaned?

On Monday evening Mr. Shaw-Lefevre moved that the second reading of the Hyde Park Corner Improvements Bill be discharged, in order that a Bill on this subject might be introduced into the other House of Parliament, which, after some consideration, was agreed to without a division. We have more faith, on the whole, in the Upper House than in the Lower in matters of taste; however, we shall see. The same evening Mr. Lowther, in asking a rather frivolous question of the First Commissioner in regard to a chimney-pot on the Wellington arch, was a little more sarcastic than he was probably aware of, when he inquired whether the Royal Academicians had not recorded an objection to this feature as "contrary to all canons of proportion"; but Mr. Lowther's unconscious satire hits, not the Academicians, but the members of Parliament and other outside critics, who, whenever they want to find fault with anything, talk about "canons of proportion." Have any of the persons who use this phrase the slightest idea what they mean by it?

We have received a circular from the Society which has called itself by the rather unhappy name of the "Earth to Earth" Society, headed "Reasons against Cremation," and accompanied by a pamphlet containing a reprint of various articles and letters in the *Times* in reference to Mr. Seymour Haden's proposals for interment, which are known to our readers. The paper of "Reasons" we consider in some respects a very weak and foolish one, and likely to do little good to a cause to which, however, as we have before said, we are by no means opposed. All that we say on behalf of the cremators is this, that an increasing number of people are beginning to look favourably on that method of disposing of the remains of their deceased friends; that some very high medical and sanitary authorities recommend it; that it has been decided to be legal under certain conditions; and that it is time that the Government recognised these facts and put the system under formal licence, so that it may be carried out, when desired, with decorum and without abuse. The only practical paragraph among the "reasons" is that in regard to "the medico-legal difficulty" arising in cases of suspecting poisoning, the importance of which no one ought to overlook. As a specimen of the sentimental reasons given, we may quote this:—"Because the sacred utterance from the Book of Genesis with reference to the origin and physical end of man has for four thousand years been interpreted to be a divine oracle enjoining the burial of the dead." We might as well revive the injunction against gathering sticks and cooking on the Sabbath day.

If the successive issues of Dr. Baumeister's *Denkmäler des Klassischen Alterthums* equal the first number, which has just appeared, the work will be a marvel of varied excellence. It is undertaken, as the editor states, in the interest, not of specialists, but of the general educated public who need for reference a cheap and handy *répertoire* of classical archaeology. It is intended to include,—1. The history of classical art in the various branches of architecture, plastic, painting, music. 2. Mythology, so far as illustrated by art. 3. Private life of the ancients. 4. Portraiture of historical persons. 5. Coins, from the historical as well as as artistic points of view. 6. Topography of all important classical sites, e.g., Rome, Athens, Pompeii, Mycenae, Troy, Syracuse, &c. 7. Organisations of classical armies and fleets. 8. Palaeography. The number which has already appeared contains admirable articles on Achilles, Adonia, Adrastus, Ajax, Actæon, with numerous illustrations from vase-paintings and bas-reliefs, some not easily accessible elsewhere; a full dissertation on ancient ploughing (Ackerbau); portraits of Alexander

the superintendence of Mr. A. Waterhouse, A.R.A., architect. The foundations were executed by Messrs. Munday, and the contract for the superstructure was undertaken by Mr. H. Lovatt, builder, of Wolverhampton, the cost of the building being 70,000*l*. In the basement are also the apparatus, boilers, and machinery for heating and ventilating the whole building, which have been executed by Messrs. J. L. Bacon & Co. The entrance-hall and principal staircase form the central feature of the interior of the college; these are encased internally in Burnmantoff's faience ware by Messrs. Wilcock & Co., of Leeds, and present a very attractive appearance. The entrance-hall and principal corridors on the ground and first floors are paved with marble mosaic paving by Messrs. Burke & Co. A large view of the front elevation to Exhibition-road, which has a frontage of 300 ft., together with a ground-plan and a general description of the building, will be found in the *Builder* of January 5th last.

ON CATHEDRAL PLANNING AND SOME CATHEDRAL PLANS.*

We are scarcely free to-day from the charms of the Middle Ages, the earnestness and affection that have characterised the revival of Mediaevalism by the great men whom some of us have been privileged to know before their work was done, possess great attractive force, though, perhaps, now falling short of infectiousness as we move away from them down the stream of time, and become more and more involved in our own struggle of life.

The gentle influences of culture, and that breadth of sympathy which characterises our age, were gradually regaining for the hitherto despised and neglected Gothic architecture that share of the affection which all true artists entertain for earnest art, of whatever epoch or people, which was hers by merit. When the Tractarian movement, with its revived Church orders and ceremonies of the Middle Ages, suddenly invaded the province of architecture, and filled the Gothic styles and arts into an extraordinary popularity, a popularity strong enough to blind the eyes of architects to the beauties of all art that was not Gothic.

Happily architecture at present is without the immediate prospect of such another intrusion, and it is rather in fear of the reaction which invariably follows such sudden invasions that I wish to draw attention back to our cathedrals, not for a fresh dissertation on their origin and development, or for an exposition of their various parts and services,—for these have been so fully dwelt upon, one might almost say exhausted, in spite of their deep interest, by those men to whom reference has been made,—but to observe them as works of architecture, pure and simple, trying to ascertain, apart from the delightful association of their history, what artistic lessons we may derive for our benefit.

Architecture being an art (as well as the science that supplies a want in the most skillful way), the greatest achievements of the architect are those in which, inspired by love to his art, he has striven solely to accomplish the noblest and best work, as in the more abstract sister arts of painting and sculpture, above and apart from all subjective considerations, though he may have the highest subject for his exercise,—the planning of a cathedral.

A little consideration will show us that there are three principles that rule all cathedral plans. Firstly, the cruciform plan; secondly, that emphatic element of plan, the stone vault (remember, the vault of a cathedral is seen on plan to the greatest extent); and thirdly, and closely connected with the vault, is the principle of nave and aisles,—that is, a central aisle and an indefinite number of side ones.

I shall be unable to-night to deal with the great question of vaults, or how far they actually are responsible for cathedral plans, as we find them; but propose to regard the plan as a work of fine art, complete in itself, treating of the relative proportions of its parts, and their harmony one with another. This brings us at once to that which we have said is the first element we find in all cathedral plans, viz., the cruciform.

Here I will observe that in dwelling upon what has been done in the past and the invariableness of plan that is so apparent, I am far from desiring to appear to forbid any

departure in the direction of originality for the future. Our future cathedrals, now that we have the plans of the world before us, are too large a subject to be even referred to now, though it would furnish a prophet who was daily impressed with the possibilities of genius, with an almost inexhaustible theme. The Latin cross is the root common to the plans of all cathedrals built west of Byzantine influence. From the earliest days when Christianity ripened into sufficient strength to adapt existing buildings to her use on to the Middle Ages, when nations vied with each other in making the cathedrals of their land triumphs of architecture and treasure-houses of all the arts, devoting to their construction and adornment enormous treasure, and not even sparing trouble to obtain the help of architects and men of genius from foreign lands, down to our own days, when we build cathedrals under such strangely different circumstances, with means obtained often in the smallest quantities and by the greatest exertions. Over this long period the Latin cross has held its own as the basis on which the cathedral is to rise. Its reign (as far as the Western Empire is concerned) has been undisputed; architects, and all on whom the origination of a church of any magnitude devolved, seem to have submitted their plans to it without a murmur.

The tremendous revolution of taste which recreated all arts at the Classic Renaissance in the fifteenth century, left undisturbed the ancient plan. The most thorough revivalist of principles and details made his earnestness for his art second to his adherence to this tradition. When the Renaissance style, which began by affecting small Mediaeval ornaments, had spread throughout the entire system of the edifice, had shaken off all Gothic ties, and become really original, the reign of the cruciform plan remains stable. We see this remarkably illustrated in the three plans prepared for the rebuilding of the old basilica of St. Peter at Rome, by Bramante, San Gallo, and Michelangelo; each one departs further from the Gothic types, till Michelangelo succeeded in carrying out his boast, that he would raise the Pantheon upon the top of the Temple of Peace (the largeness of idea and grasp are characteristic of the true admiration he possessed for the Classics,—a rather different spirit and method of reviving bygone styles than that to which we have been accustomed in this century); but the cruciform remains the plan of St. Peter's, and of all the Renaissance cathedrals.

It is the same, to the evident trouble of the architecture, in Sir Christopher Wren's design for a Protestant cathedral of St. Paul, as it is also in the present building, erected for a more elastic ritual; we find it in Les Invalides of Mansard, in the Ste. Geneviève of Soufflot, and in our own times it holds its own in spite of the originality that is imported into all branches of design by the competition system.

We have before us a series of buildings, the work of the most civilised nations of the world, the growth of a period of over 1,500 years, which, though they are bound by strict but almost intangible bonds to a particular scheme of plan, and were built for an almost uniform service, are most diverse from one another. Varied and wonderful as are the beauties and aspects of nature which tell of an Infinite Creator, they are scarcely more varied or beautiful than the works of man, who alone of all His creatures is endowed with creative faculties by the divine power of design. The variety of cathedral plans is astonishing, and the variety in that variety, of almost all architectural forms, is equally remarkable, as a glance at the ground-plan of either Lincoln or Ratisbon cathedrals, as examples, will show us. Besides the many square proportions given in the nave and transepts, polygonal and circular forms are represented in the chapter-houses and chapels, vistas of the cloister alleys give relief to the impressions produced by the colonnades of the interior, the smaller parts and details of the choir to the larger features of the rest of the building, and so on in varying contrast.

Having glanced at the fact that the adoption of the cruciform plan has been and is universal, we may next consider what reasons present themselves to account for this.

The first is that it is the result of a definite tradition that the shape of the cross of Christ should be the foundation of the buildings erected for the use of His church,—a tradition that has derived additional force from an unbroken string of precedents. Second, that it

was adopted and used for its undoubted convenience of arrangement. And the third, that its artistic merits are strong enough to account for the fact in question.

I am inclined very strongly to be of the opinion that the first-suggested reason has had very little to do with the point we are considering. Among other reasons, if the tradition of the necessity of the actual foundation of the material church being the form of the cross had such weight as some would have us believe, why was it not extended to all churches instead of only being applied to large ones and cathedrals? There is too great a tendency to make the outward and visibles of religion do the duty of the inward and spiritual, and to this tendency, wrong as it is, the value given to the tradition must be due. Again, if it was considered proper that the cross should be so important and of such moment that the plan must be conformed to it, its moment and importance would be made more forcible and real to the worshippers who needed impressing, and to whom only the elevation of the building appeared in which the cross only appears as an ornament and plays no fundamental part in the design. And we find, as I have noticed, that Protestant churches built in times when such symbols and traditions were warmly disowned, adhered to the same plan, which would not have been the case if any known superstition attached to it. Firmly as I believe that the Cross of Christ is the starting-point of all real religion, and that the future of mankind is indissolubly bound up with it, I am compelled to disconnect it with the cruciform planning of cathedrals.

The second reason, that of the convenience of its arrangement for congregational worship, no doubt had not a little to do with the popularity of the plan, but these conveniences were so persistently disregarded (with isolated exceptions of course) in the arrangement of the churches for service that it cannot have been for this reason (though other nineteenth-century echoes might object), that its use is universal. Observe the fine position in the crossing for the focus of the service. The congregation can be grouped all round in manageable detached bodies in the nave and transepts, with the singers behind in the choir, all being well able to see what is going on. It may be remembered that Mr. Street expressed his firm opinion at the time of the alteration and removal of St. Paul's screen, that under the centre of the dome, at the crossing, was the proper place for the Communion-table. Were this arrangement generally adopted our cathedral naves would become integral parts of the church and not be used on rare occasions only.

However, the cathedral builders instead of making the best use of the plan, out off the choir and chancel by enclosing them with screen walls, not in the centre under the lantern, but away by themselves, and the table is pushed away in front of them into the mystery of distance. A notable exception is St. Peter's, at Rome, where the altar is in its best place, but this cathedral, owing to its vast piers, must be unusually defective in congregational comfort, and, in all probability, it was done for the last of the three reasons which we have now to consider.

Thus we are driven to the conclusion, and a not unwelcome one, that the cruciform plan owes its adoption to its artistic merits and capabilities. Its invaluable to us our Gothic cathedrals we are all conscious of. The Renaissance and Classic architects, who could afford to lose sight of Gothic architecture as an art and regard it as a barbarism, knew that they could not do without its artistic help. It is in vogue nowadays, perhaps for the sake of a little tradition, more convenience, and a little art. Or more likely still, the fact that the Goths used it is sufficient for us without troubling much further.

English architects seem to have grasped with a firm hand the artistic qualities of the cruciform plan. We have Lincoln Cathedral as an example to-night,* and perhaps it might be difficult to find one more complete in itself, or more typical of our national peculiarities. As a mere ground-plan it is a work of fine art, well proportioned and interesting, with beautiful forms employed about it. The foot of the cross is sufficiently deep to balance its great length, being formed by the two western towers, and transepts; these latter are of little or no use to

* See lithographed illustration of various cathedral plans.

* By Mr. A. Beresford Pite. Read before the Architectural Association on the 2nd inst., as elsewhere mentioned.

the nave as transepts; both are closely screened off, and used for the independent purposes of a morning chapel and a consistory court. They have less still to do with the elevation, being only of the same height as the side aisles; but, as we shall see, they have a distinct architectural value on plan.

The nave has seven bays, the two westernmost ones being narrower than the others, originally, without doubt, because it was built from the choir to meet the older Norman work of the front,—observe the Norman nave as seen between the towers was narrower than the present one,—but these two narrower western bays bring the transept vaults, of equivalent width, into harmony and connexion with the side aisles, and are very beautiful specimens of groining. The dimension of these two nave bays governs the projection of the transepts, which we feel to be the just one, as it is base enough to balance without rivaling the great crossing. Remember, if we were dealing with a cross in upright elevation, the base would bring the cross on to the ground-line, which carries the eye away beyond the projection of the arms. The screens which divide the nave from the chapel and consistory court are original work, not later additions; notice their value to the whole plan; they carry the nave at its normal width past the transepts, till it butts against the towers. Though the transepts only effect a junction with the side-aisle vaults, and do not pass the main arcade, you will see by a look at the plan how the nave would have been shortened and its proportion to the whole lost, besides the creation of a western rival to the great transepts, had these low stone screen walls been omitted from the plan.

For the sake, therefore, of its hidden beauty, and also for that of the architect, who brought the older building into union with his, with such consummate skill as to make a perfectly-proportioned plan out of two incongruous parts, we trust that these screens may yet escape the hands of "unbroken vista" lovers. Before we leave the west end observe how artistically the octagonal turrets turn the corners of the front; they are poised in an unusual way, having but little projection on the front, and considerable at the sides and back. This may be merely because the front pre-existed of a fixed width, which did not agree with the dimension that governs the western transepts.

In all probability, one of ourselves, a modern architect, would have made our transepts extend just a trifle more, so that those pinnacles should stand at the exact angle of the building. It seems to us to be the right sort of thing to do, but then the valuable "clay" which they exercise on the plan would be lost; as they stand they furnish us with fixed points from which we can comprehend the scheme of the base. It will be seen that this is not exaggerating the importance of accidents, or of features that may have been designed without any relation to the plan, only for their primary value to the front in elevation, when we turn to other examples and find the same results obtained by similar means.

Peterborough has a small plan with a very simple outline, as there is distinctly no feature to interrupt the cross; it is in this simple completeness unique, and contrasts remarkably with the plan we have been just considering. Its proportion as a whole is very good. If there is a fault, it is that the upper part of the cross is a trifle too long; half the width of a bay of the Lady-chapel might be spared.

It is to be observed that in nearly all English plans whatever may have been the original length determined on, subsequent alterations have pushed the building eastwards, generally with the happiest effects, as this otherwise inordinate extension of the upper part was made proportionate by such successful expedients as choir-transepts, or by a diminution of width in the presbytery, or by a more considerable one in the Lady-chapel beyond; also by the accentuation of the main crossing with the same purpose in view as at Ely and Winchester.

The western transepts, which form the *raison d'être* of the Peterborough façade, are like those of Lincoln in one respect, being of little projection in proportion to their depth, their dimension being the width of the side aisles.

They are divided from north to south by the wall which gives recess to the front and produces a very beautiful effect on plan. It reduces the western transepts to a width which makes them a base or plinth to the cross. At

Lincoln the base of the cross is formed by the square subdivided masses of the towers. The western transepts, as we have seen, counterpoising the greater transepts with the entire length of the church, the screen walls purposely preventing the foot or plinth of the cross from being realised in order to preserve the effect of the nave. The Peterborough nave is long enough, and the transepts consequently can become not merely an external counterpoise to the other masses of the building and be partly absorbed by the nave, but have a definite relation to the idea of the cross, as its foot. The total depth is just as necessary to the whole, and what is superfluous to the plinth is cut off by the cross wall, and becomes the glorious (the term is not too strong) recessing to the arches of the façade. This is the secret of the mystery of the front. Anything but a hollow sham having no relation to the whole, it is in fact the result of a masterly and beautiful plan. The towers which bound the front are delicately and subtly stepped forward, with almost the effect of a curve, and form the lower feet from which the cross rises firmly and gracefully, the broad splaying of the arches and the recesses behind aiding this impression; the later porch which projects beyond is fortunately cut off on plan by these recesses. Peterborough is the only cathedral plan I know that can be looked at in upright elevation with an entirely satisfactory result.

Salisbury, though on a smaller scale, is a plan of similar proportions and scheme to Lincoln, but without the western transepts. It was built a short time after the nave of Lincoln, in 1220. It is a double cross, having transepts of the same relative projection, and there is but little difference in the proportionate lengths of the choir and presbytery. The scheme of the cloisters and chapter-house is also similar, but they are in a position which the exigencies of the site did not permit at Lincoln, on the south side of the nave,—the more usual position. To a certain extent, perhaps, this position may give a finish or balance to the western end of the cathedral, on the south side, but something seems needed on the north. The porch would scarcely supply the need, or be important enough for the position. The length of the nave without being interrupted needs the balance and base that the western transepts give to Lincoln.

A comparison between the two cathedrals in these particulars is the more justifiable, as both the west fronts are designed on the same principle, being façades, distinct architectural compositions complete in themselves, like framed pictures, with corresponding turrets at the ends. These turrets are not pitched on the intersection of the front and side, on "the correct angle," but are placed as terminations to the front, though they have not enough projection in spite of this, on the plan, to furnish us with the points that the Lincoln turrets do, and we consequently miss its completeness and beauty in this respect. A visitor to Salisbury feels that there is a lack of interest at the farther end of the nave, especially after turning away from the choir, it seems too long a walk. The very fine old stained glass in the western windows is a strong attraction, doubtless, but cannot atone for the architect's apparent lack of resource in allowing his nave to become monotonous. It cannot be that he was unwise enough to design that this impression should be produced, to increase the effect of his west front, *four de force*, awaiting one beyond the welcome door. It must be remembered, in criticising Salisbury, that it is practically the work of a single mind and generation, being one complete erection,—at all events, as far as the plan goes. This is scarcely the case with any other of our cathedrals of Medieval age.

We will not stay to consider at such length further plans, having taken our types. We have only to notice variations or developments.*

Entertainments for the People.—Miss Emma Cons is throwing much energy into her management of the Royal Victoria Coffee Hall, and, besides providing "variety" entertainments on other evenings of the week, has arranged for a series of ballad concerts on Thursday evenings during May, which will be conducted by Madame Mina Gould and others. M. Lubinoff, a Russian tragedian, is arranging for some costume recitals in June.

* To be continued.

THE STUDY OF EARTHQUAKES.

The following is extracted from a paper on this subject, read by Mr. H. Lefevre, at the Royal Aquarium, last week:—

Notwithstanding the frequency of earthquakes, and although we have at our disposal accounts of many thousand instances of such disturbances of the earth, there still remains a great deal to be done before we can thoroughly understand the real nature of the phenomenon, together with its effects and relations with other natural phenomena. It is only within the last few years that this study has made any steps in advance, but this progress is of so important a character that we may hope soon to arrive at a solution of some interesting questions in this chapter of natural history.

From the impression produced upon our senses, and from its mechanical effect, three different kinds of earthquakes are distinguishable.

1. The disturbance or vertical shaking movement of which the shock is from below upward.
2. The disturbance or horizontal concussion with a lateral shock.
3. The undulating movement during which the ground oscillates as if it were agitated by waves.

By a few examples, let us give, in the first place, an idea of the mechanical effects of these phenomena. In 1783 an earthquake took place in Calabria,—the summits of the mountains in many places disappeared and their outline became distinctly changed, and their outline became the fallen ruins, which enclosed the valleys as with barricades; houses were hurled into the air as if projected from a mine; the paving stones of the streets flew through the air like balls from a cannon: while at Rio Bamba, in 1797, the bodies of the dead were torn from their tombs; several hundreds of persons were thrown into the air and their dead bodies fell upon the summit of a lofty hill on the opposite side of the river. In Chili a flagstaff of enormous size was seen to be deeply imbedded in the earth, having been violently wrenched out of its place. As regards the undulating movement here are some examples, descriptions of which have been given and authenticated. Some trees were bent so much that their branches were broken by striking the ground, while at a distance could be seen through the long avenue of trees the progressive march of the wave. In 1811 Missouri forests were observed to oscillate like cornfields beaten down by a storm. In 1870, at Battang, in China, the ground was moved at first like the sea in a calm, and in another moment like the ocean when lashed by a hurricane.

On the 26th of March, 1812, the ground at Caracas resembled a boiling liquid. On the 7th of June, 1692, at Port Royal, Jamaica, men were hustled about, thrown one against another, and grievously injured. Earthquakes are occasionally accompanied by cracks or rents in the ground, which either remain open, or almost in a moment close again, as at Port Royal in 1692, when people were seen to be swallowed up in the fissures, and in some instances hurled up into the air, crushed and mutilated. In the earthquakes before referred to, in Calabria, houses, with all their occupants and contents, disappeared in chasms, some of which instantly again closed over them, while others remained open. At Lisbon the entire quay, on which thousands of the terrified inhabitants had taken refuge, suddenly sank beneath the waters of the Tagus, to an unfathomable depth.

The same classification into concussion or shocks and undulating movements is quite as applicable to those faint tremulous rumblings we read of, which are scarcely perceptible to the senses, as to earthquakes on a grand scale, which cause such frightful disasters.

Let the earthquake be ever so violent, or ever so slight, whether it be attended by a shaking or by an undulating movement, by a single shock, or whether consisting of several in succession, it is in general accompanied by a prolonged quivering. As regards quiverings of the earth perceptible to the senses, if we employ instruments sufficiently sensitive we almost always, and almost everywhere, trace them to some perturbations which are either slight shocks of earthquake, or the reverberations of some far distant, or are, in short, due to external causes of some kind.

Earthquakes are more violent in the superficial strata than in strata that are deeper; that

is probably due to the fact that the former are more elastic, owing to the absence of external pressure. At the bottom of the shafts of mines, tunnels, &c., one hardly feels them; indeed, they are often not felt at all. The shock is transmitted very differently, according to the density of the strata; thus, along thick layers of alluvium or detritum the disturbance appears to travel with the same difficulty as the vibrations of sound travel along sawdust.

On the other hand, in the localities whereon a compact mass of rock a thin movable layer of earth reposes, the latter shakes and vibrates exactly as sand does on a table when a piano is played. Thus at Lisbon the ravages were greater in the strata than the alluvial stratum is than at Berlin and Breslau where the strata is thick, and where earthquakes are very seldom perceived, and when they occur are uniformly slight.

It often happens that the same shock is felt very differently in localities situated under identical conditions, and quite close to each other. One house is overturned, whilst its neighbour remains untouched (as, for instance, in Syria, in 1837). In other cases, on the other hand, the same effects are experienced over a great extent of country. Thus, on the 16th of November, 1827, every place situated between Ragota and Sapaya, throughout a length of 1,500 kilometres, was destroyed in the same manner. In 1856 the whole of the countries bordering on the Mediterranean, from Syria to Corsica, were shaken; while the Lisbon earthquake was felt, it was said, over a very small area. This was so with a shock which in March, 1879, threw out of their beds the inhabitants of Louthall Glaris, which extended to the eastward scarcely as far as Renos, and was not felt at all either to the north of Glaris or in the southern portion of the valley of the Upper Rhine. It appears that it is sometimes valleys and sometimes mountains which limit the extension of earthquakes; but the number of shocks which have traversed an entire Alpine chain is by no means small.

The shock of earthquake is propagated with a velocity of from 350 to 500 metres a second. In some exceptional instances this rapidity rises to 800 metres, or is diminished to 150 metres a second. This average is about the same as the average velocity of sound, which is 340 metres a second.

Earthquakes are also felt on the water; a ship is shaken as if it were upheaved, her moorings are unfastened or detached, her masts broken, while no extraordinary movement of the water is observable. At other times, on the contrary, sometimes for several minutes and for some hours after the shock, the most frightful bores or upheavals of the sea are seen, which, being caused by the earthquake, ravage the submerged coasts and are frequently transmitted to an immense distance. It was by a wave of this kind that Lucia was totally destroyed in 1724, not a single inhabitant surviving the disaster! Ships were thrown over the walls and the ruins of the city, and hurled a distance of three miles from the shore into the interior of the country. Lakes, in the very heart of continents, are also sometimes violently agitated. Nearly the whole of the Swiss lakes were thus affected by the Lisbon earthquake, and their waters rocked about just as when water in any ordinary basin is shaken.

Some accidental phenomena frequently accompany earthquakes; for example, subterranean noises. These noises have been compared to thunder, to the clanking of iron chains, to rolling or rumbling noises deep down in the earth.

These subterranean noises are occasionally heard at the very moment of the shock. They often precede or follow it. Cases can also be cited remarkable for eruption of gas and smoky vapours, with peculiar odours, or fountains of liquid mud or water leaping up through openings in the ground.

It is not infrequent to find the atmosphere very highly charged with electricity; at other times electric lights are perceived, and the magnetic needle is seen to be in agitation.

Earthquakes are rather more frequent during the nighttime than during the day, and in autumn and winter more so than in summer. The influence of the position of the moon appears to be insignificant, though not altogether nugatory.

There are often earthquakes without any eruptions, and also very violent eruptions without any earthquakes of importance. The Alps

also, which are really an earthquake zone, present no trace of volcanic action. The most violent and the most extensive earthquakes on the surface of the globe are in general unconnected with volcanic phenomena.

THEORY OF EARTHQUAKES.

Questions relating to them, and how to solve them.

If we desire to ascertain the cause of an earthquake, we must above all things determine the point of departure which we call the "focus." To localise the "focus" of certain earthquakes, their position, their depth, their relation to the local structure of the strata of the earth, has been labour of the last fifteen years. Down to the present time these methods have been employed to arrive at this result.

1. To determine the focus by studying the degree of intensity of the shock, as it is evident that the intensity of the shock is uniformly stronger near to the focus than at a distance from it.

2. To determine the focus by studying the exact time at which the shock occurs, as it is manifest that, when there is an earthquake, the disturbance of the ground commences in the focus itself, and that it spreads itself gradually to a distance.

EARTHQUAKES IN GREAT BRITAIN.

History informs us that volcanoes existed in the Hebrides and Wales. Earthquakes, indeed, appear to be more frequent here than is generally thought. Up to 1858 no fewer than 255 shocks have been recorded, to say nothing of those that have passed by unnoticed by reason of their slightness. According to a list as early as the year 974 there is a note of an earthquake, and in 1101 William of Malmesbury relates that all England was terrified "with a horrid spectacle, for the buildings were lifted up and then again settled as before." Thirty-two years later many houses were overthrown and flames issued from rifts in the earth; and in 1185, according to Holinshed, "stones that lay couched fast in the earth were removed out of their places, houses were overthrown, and the great church of Lincoln rent from the top downward." On the 12th September, 1275, St. Michael's Church, in Glastonbury, was destroyed by an earthquake, and in 1361 there was a similar visitation. So frequent were shocks in her time that Queen Elizabeth caused a special form of "earthquake prayer" to be issued. There is an unconfirmed tradition that in the fifteenth century Lyme Regis was nearly destroyed. On Easter Monday, 1580, the great bell at Westminster and the bells of the various churches were set jangling; the people rushed out of the theatres in consternation; and the Templars, leaving their suppers, ran out of the hall with their knives in their hands. Part of the Temple Church was cast down, and some stones fell from St. Paul's, and two apprentices were killed at Christ Church. On the 8th of September, 1692, the merchants were driven from 'Change, and the streets filled with a panic-stricken crowd of swooning or wondering people. In 1750 there were so many shocks that White's was kept busy betting on the events, Grub-street publishing pamphlets regarding them, and quacks selling pills "good against the earthquake." Five years later the Lisbon earthquake agitated the waters of the fish-pond at Peers Pool, in the City-road, and as late as 1852, 1859, 1860, 1863, 1868, and 1871, various local shocks have been recorded; while only last year a slight tremour was felt in the southern counties. Indeed, there is an area within sixty miles of Comrie, in Perthshire, which, as the seismometer in the tower of the parish church and the numerous reports in the annals of the British Association amply demonstrate, is rarely at peace, though the shocks are so faint that they require the aid of delicate instruments for their detection.

The connexion which might exist between earthquakes and the sun and moon was worked out by Mr. Perry, and his results examined by a commission appointed for the purpose by the French Academy of Sciences.

It was supposed by Mr. Perry that the sun and moon executed an attractive force upon the crust of the earth, just as it does upon the waters of the ocean, and cause it to swell until, meeting with resistance, the formation of fractures resulted, and hence the production of earthquakes.

By different analyses, and comparing them with the motions of the moon amongst other

results which were arrived at, he came to the conclusion that earthquakes were more numerous when the moon was in perigee than when in apogee. Is it likely that the attractive power of the moon is so great that it could draw up the crust of the earth beyond its elastic limits? We know what it can do with water; it can lift up a hemispherical shell 12,000 miles in length, about 2 ft. or 3 ft. higher at its crown than it lifts the earth, even supposing the solid crust to be lifted one hundred times the apparent rise of the tide. Is it likely that a hemispherical arch 12,000 miles long, when it is raised 200 ft. at its crown, could by any possibility suffer fracture?

If an arch is 12,000 miles in length all that we here ask is, whether the materials which compose the arch are sufficiently elastic to allow themselves to be so far stretched that the crown may be raised 200 ft.

The result which we should arrive at is apparently so obvious that actual calculation seems hardly necessary.

Mr. W. S. Chapin since then has conclusively shown that the earthquakes taking place in Japan, to the extent of over 1,000 years, are in utter discordance with this theory.

Foremost among all workers in the study of Seismic Science, we have had Mr. Robert Mallet, C.E., and Mr. Perry of Dijon; the labour of the former of these workers has been carefully examined and criticised by the British Association, and the latter by the French Academy of Sciences.

Up to comparatively recent times we have had, in an elaborate and exhaustive series of reports prepared by Mr. Robert Mallet for the British Association, an epitome and masterly co-ordination of all the facts which have been accumulated and the results obtained in the department of seismic science since very early times; with the results of these reports, which are founded upon varied analyses of over seven thousand recorded earthquakes, no doubt most of us are familiar; the results, we find, do not bring us to the threshold of positive knowledge, and they are chiefly negative in their nature, and the main reward of toil, so far, is the having cleared away the rubbish and shown us the road in seismic science above which the sign "no thoroughfare" is written.

The following letter from Mr. J. S. Green, Yokohama, was read at the meeting:—

"Sir,—To confirm my present observations, which have given me two curves of approximately true earthquake motion, and to be able to state definitely what these actual motions are, I am now anxiously waiting for about three more good shakes. One feels as anxious as a fisherman who is waiting for his float to bob. Earthquakes are no doubt very alarming, and when they shake down chimneys they are likely to be regarded as dangerous and unpleasant visitors. If, however, you could only persuade all your friends to go in for seismographs, I think they would derive from them a pleasure never anticipated. Those who lost their chimneys would, when they reflected upon the advantages which accrue to science when the nature of the movement that caused the fall of the chimneys has been studied, wish they had twenty more chimneys in readiness for an immediate repetition of the shock. Besides endeavouring to obtain the true motion of any earth particle, I have for special reasons been endeavouring to obtain records of the smaller shakings. By the use of a special form of microphone, when it is properly placed, it is not difficult to detect any movement, however slight, of the earth's crust. My microphones are buried in pits round about the house. Precautions have been taken to keep out insects, otherwise the tramping of a beetle would register as an earthquake. The pits must also be dug at a distance from a roadway or path, otherwise every step of persons passing, even if six yards distant, will be indicated by the recorder.

If several microphones were placed round about a house, not only would they be useful as seismographs, but they would indicate the creeping of an approaching thief; and lying in bed with a telephone to your ear you might count the number of steps as he approached towards your bedroom window. This hesitation would be indicated in the pauses between the steps, and you might thus have a basis upon which to speculate as to the temperature of your visitor.

Excluding beetles, thieves, and unexpected visitors, it would seem that for some time before the occurrence of a "shock" the telephone gives signs that the earth is cracking as if under an increasing strain; these indications continue for uncertain periods, but they have been distinctly noticeable before the last few earthquakes. It would seem that the power of resistance of the earth before any surface movement is felt is very great; but at last, like a bending stick, it suddenly breaks, and the jar gives the vibrations what we call an earthquake. If

these "crackles" can be detected we shall then have the means of approximately foretelling when the consequent crash is at hand. This, I think, has already been roughly indicated; but before making positive statements on this subject my present observations must be verified by repetitions.

J. S. GREEN.

This letter was read showing the application of microphones and telephones to the discovery of earthquakes.

SCULPTURE AT THE ROYAL ACADEMY.

I.—"GODIVA": BY C. B. BIRCH, A.R.A.

We propose giving some illustrations of the leading works of sculpture in the Royal Academy, sculpture being the art which, among the plastic arts, is most nearly allied to architecture and most often employed in close connexion with it; and we are further moved to this by a feeling that sculpture, in the Academy exhibitions, receives far less attention than from its importance, as perhaps the most intellectual of all the arts, it merits. If any further reason be required, we believe that not a few of our readers and subscribers will be very glad to have these illustrations.

We commence accordingly with the group which we think most people will admit to be the prominent and leading sculptural work of the year, Mr. Birch's "Godiva," on which the artist may be congratulated on having achieved a really fine and expressive treatment of a subject which has been, unhappily, terribly vulgarised by artists of all denominations. The heroic sacrifice of the lady in the old Coventry legend (the historical accuracy of which, by the way, one of her descendants has called in question recently) has been the excuse for every dandy who wanted a title for a "nude study"; and even artists of higher calibre have treated it as a mere opportunity for the display of figure drawing. Mr. Birch has risen to a higher conception of the subject. His "Godiva" is no mere nude nymph, but a woman of high feeling and queenly dignity. The head, rather large in proportion to the body, emphasises this character, and the expression of the face, from whatever point of view we take it, is exceedingly fine and pathetic. A beautiful touch of expression is given by the attitude of the right hand laid on the horse's neck, not prone, but with the palm turned upwards, as if in supplication or appeal. The horse is very finely modelled, and the two group well together; the unity of the composition being assisted by the broad mass of the drapery serving to unite the vertical and horizontal lines of the figure and the horse.

The interest of our illustration will not be lessened by the fact that it is a facsimile of Mr. Birch's own drawing, kindly made expressly for our pages.

OLD LONDON BRIDGE AND ITS APPROACHES.

No building in England seems formerly to have impressed foreign visitors to this island with such astonishment as did "Old London Bridge." Wonderful as it was in reality, the description of it, written by a Roman ecclesiastic, who saw it in the sixteenth century, almost equals the marvels related in the voyages of Sir John Mandeville, and we need scarcely say greatly exaggerates its grandeur. Amongst other things he describes the bridge as being a mile long, 100 ft. high, and crowned with palaces and churches. Although, of course, this is an exaggeration, yet it serves to show what a very remarkable impression this edifice must have left upon the mind of the writer, who, be it remembered, had seen the architectural glories of Italy and those of the "Eternal City." It is fortunately possible for us to recall the appearance of the ancient bridge during almost every period of its existence; the great difficulty, however, in making a restoration of it, is to avoid anachronisms, and to be certain that the various buildings shown were all in existence at the same epoch, for the changes and alterations were very frequent, owing in a great measure to the numerous vicissitudes which befell this structure, especially from fire and tempest. The first stone of "Old London Bridge" was laid in the year 1176, and it was completed in 1206. The architect was a parish priest, who is known as Peter of Colechurch. Whatever defects there may have been in the way of construction, however much the architects and engineers of the last cen-

tury, and even of the present day, may have sneered at his primitive ideas of engineering science, yet Peter of Colechurch did what probably no man ever did before or since his time,—that is, he built a bridge of stone, nearly a thousand feet long, over a great tidal river, which lasted nearly seven centuries. The bridges erected by his eighteenth-century critics in London have all disappeared, and, if we may judge from the experiences of the past few years, there is little to lead us to suppose that any of the bridges erected in our day are likely to last for even one-third of the time. Although in later times the bridge was covered with houses, yet, as originally erected, the only buildings upon it were two gateways, one at either end, and the double chapel erected upon the eastern portion of the centre sterling. Probably no other buildings of any kind were erected until the close of the fifteenth century. From this time, however, the bridge came by degrees to assume the appearance of a street with breaks at intervals. At the middle of the sixteenth century these intervals between the houses were reduced to three. During the fourteenth century a tower with a gateway beneath it stood upon the seventh pier from the Surrey side, and upon this tower the heads of traitors who had been executed for high treason were exposed. In 1577 this tower was taken down, and the heads and limbs of the traitors were removed to the gate at the Southwark end of the bridge. This Southwark gate appears to have been either partly or entirely rebuilt at that period, and the magnificent structure called "Nonesuch House" was erected on the site of the ancient tower. What was the precise object for which "Nonesuch House" was erected, whether it was a Royal palace or was intended as a residence for the Lord Mayor we are unable to say. It is stated by some writers to have been composed of timber, wrought and carved in the Low Countries, and floated piecemeal up the Thames. To judge from the representations of it, it must have borne a strong resemblance to the timber houses in Hildesheim and other towns in the north of Germany. Between the Southwark gate and Nonesuch House stood another very remarkable house, which was adorned with semicircular bow windows and crowned by a battlement. That this building was of considerable importance may be gathered from the fact that its foundation-stone was laid by the Lord Mayor in state, in the year 1577. Probably this building served the same purpose as the present Bridge House.

The pier upon which Nonesuch House stood was connected with the next pier to the south, not by an arch, but by a drawbridge, and this drawbridge has given rise to much controversy; for, as London Bridge had nineteen piers, some people maintain that it should be described as possessing twenty arches, but others more correctly maintain that a drawbridge could not be reckoned as an arch, and that, therefore, it could only be described as possessing nineteen arches; and this is the view taken in a singular old poem by John Leland, entitled "Kykneion Asma," or the "Song of the Swan," a translation of which is given in the Chronicles of London Bridge, 1827. The passage we refer to is as follows:—

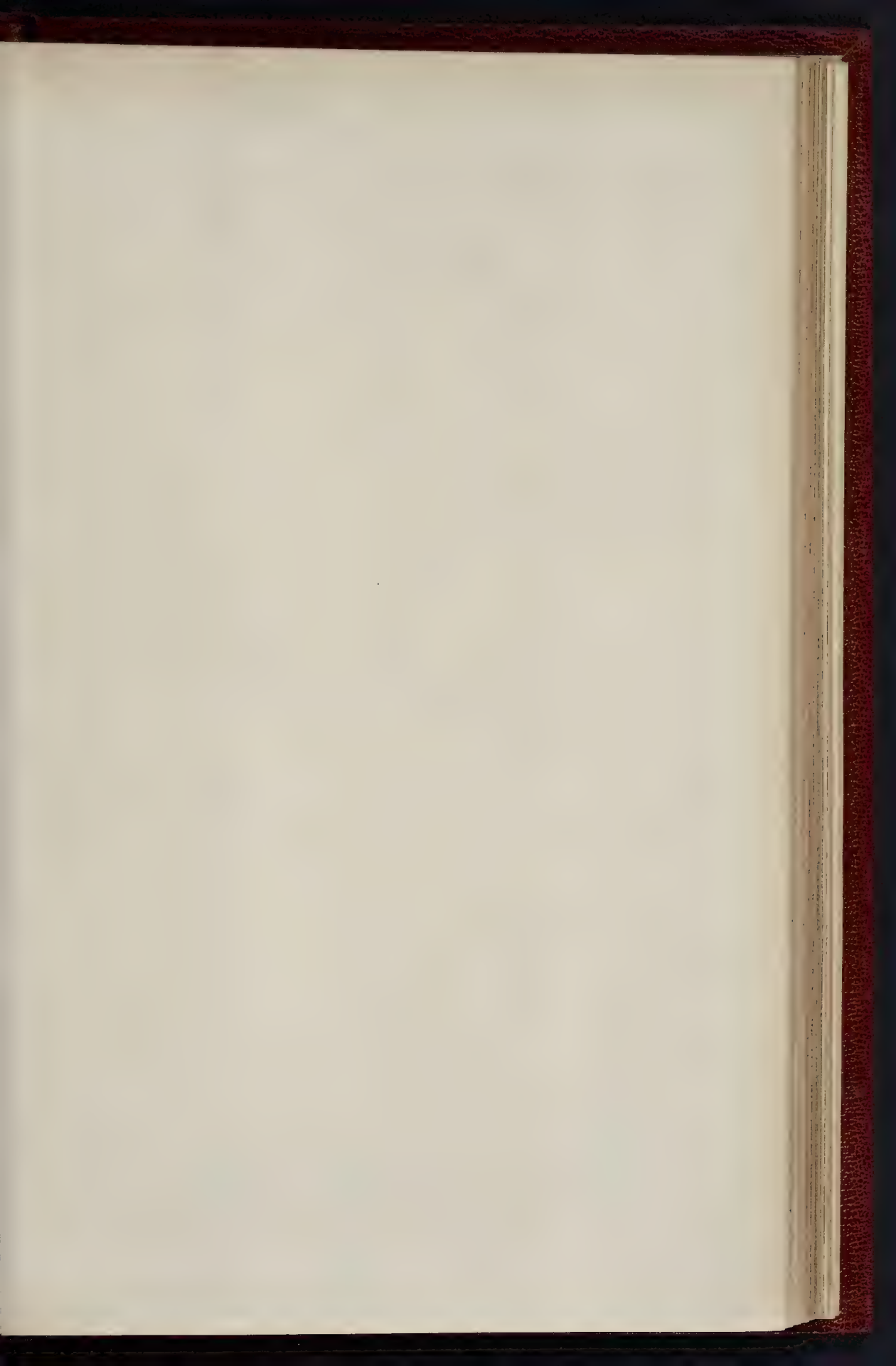
"The streaming river bears us on
To London's mighty Babylon:
And that vast bridge, which proudly soars,
Where Thames through nineteen arches roars,
And many a lofty dome on high
It raises towering to the sky."

The greatest defect of Old London Bridge was the immense obstruction to the water-way, caused by the piers and projecting sterling. Some idea of this may be gained from the fact, that although the bridge was 926 ft. long at low tide, when the water did not cover the sterling, the "water-way" was reduced to 194 ft., and an inquiry into the dangers attending the navigation of the old bridge shortly before its destruction reveals the fact that, although the water at low tide was 10 ft. deep, under the central arch it was sometimes only 18 in. deep a few yards "below bridge." The fall of water at the obb of the tide was often as much as 8 ft., and at "full flow" must have been equally great in the opposite direction, so that the river could only have been navigable for large barges within about an hour or so of high tide. The Thames watermen became very expert at what was called "shooting the bridge"; that is, taking a boat down the cataract without either upsetting it or going under water. The term

"shooting the bridge" has remained in common use, although it does not now convey the idea of danger, which it formerly did. Our view represents the bridge at "slack water." The existing ancient views of London Bridge are very numerous; those in the Grace collection have been carefully described in the *Builder* of April 12th, 1879, page 390. The earliest is an illumination dated 1419. The most important alteration which London Bridge underwent was in 1759, when the great centre pier was removed and replaced by an arch, and the houses on the bridge were removed. Attached to the approaches of London Bridge were several buildings of considerable interest. At the London end stood the Church of St. Magnus, which was destroyed by the Great Fire in 1666, and was subsequently rebuilt by Wren, and on the opposite side of the road were erected the first London waterworks; they seem to have possessed a lofty and picturesque tower, and to have dated from about the year 1588. At the Southwark end were the corn-mills, the Priory and Church of St. Mary Overy, and Winchester Palace. The Church of St. Mary Overy, now called St. Saviour's, is still a remarkably beautiful building, though it suffered terribly from the neglect of the seventeenth and eighteenth centuries, and still more from a disastrous "restoration" commenced in the year 1830. In speaking of this most mischievous work, we do not wish it to be understood that we intend to throw any blame upon the first architect employed,—the late George Gwilt. If his advice had only been followed, we should not have now to lament the destruction of the nave, the bishop's chapel, and the chapel of St. Mary Magdalene; and it is entirely owing to him that the destruction was not even more complete, for the architectural "authorities" of those days had even condemned the beautiful Lady-chapel and altar-screen. The portions of the church restored by Gwilt are well preserved, though his own work, as might be expected from the age in which it was done, is feeble and wanting in spirit. But of some of the works executed by other architects employed to complete the restoration! it would be impossible to speak too severely. The magnificent old nave, with its exquisite porches and interesting wooden vaulting, was simply pulled down to the ground and rebuilt in what was called "the neat Gothic taste!" The exterior of the transepts, though less objectionable, bears no kind of resemblance to ancient work of any period or style. The bishop's chapel, which was so ruthlessly destroyed, projected from the east end of the Lady-chapel, and was erected during the fourteenth century; it appears to have received its name from having been the burial-place of Launcelot Andrews, bishop of Winchester. The chapel, or church, of St. Mary Magdalene joined the south aisle of the choir, and consisted of a nave and two aisles; it was good, though very plain, perpendicular work, and was the only portion of the church which was not vaulted; it must have added enormously to the picturesque quality of the building, and its useless destruction must for ever be a matter of regret. Within its walls were interred, in Henry the Eighth's days, the mortal remains of William of Wykeham (the second), Bishop of Winchester. The remains of the old priory gate, and a large crypt running north and south, probably forming the lower story of the dormitory building, existed some forty years back, but the monastic refectory was destroyed more than a century ago. It is said to have possessed a roof very similar to that of Westminster Hall, and had a louvre in the centre, and a large window at the east end, in addition to those at the side, which of course proves that it was parallel to the church. Separated from the priory of St. Mary Overy by a small creek, called St. Saviour's Dock, was Winchester House. It possessed a noble hall, portions of which were in existence as late as the year 1850. The walls were of immense thickness; hardly a vestige of this building, however, now exists. A small portion of it was recently discovered and duly measured and drawn, in the course of some building alterations, and this we shall shortly illustrate. Attached to Winchester House were a chapel and cloister; and it also possessed a large well-wooded park.

Edinburgh Architectural Association.

Owing to the absence in Germany of Dr. Ferguson, his lecture on "Electric House Fittings" is postponed until further notice.

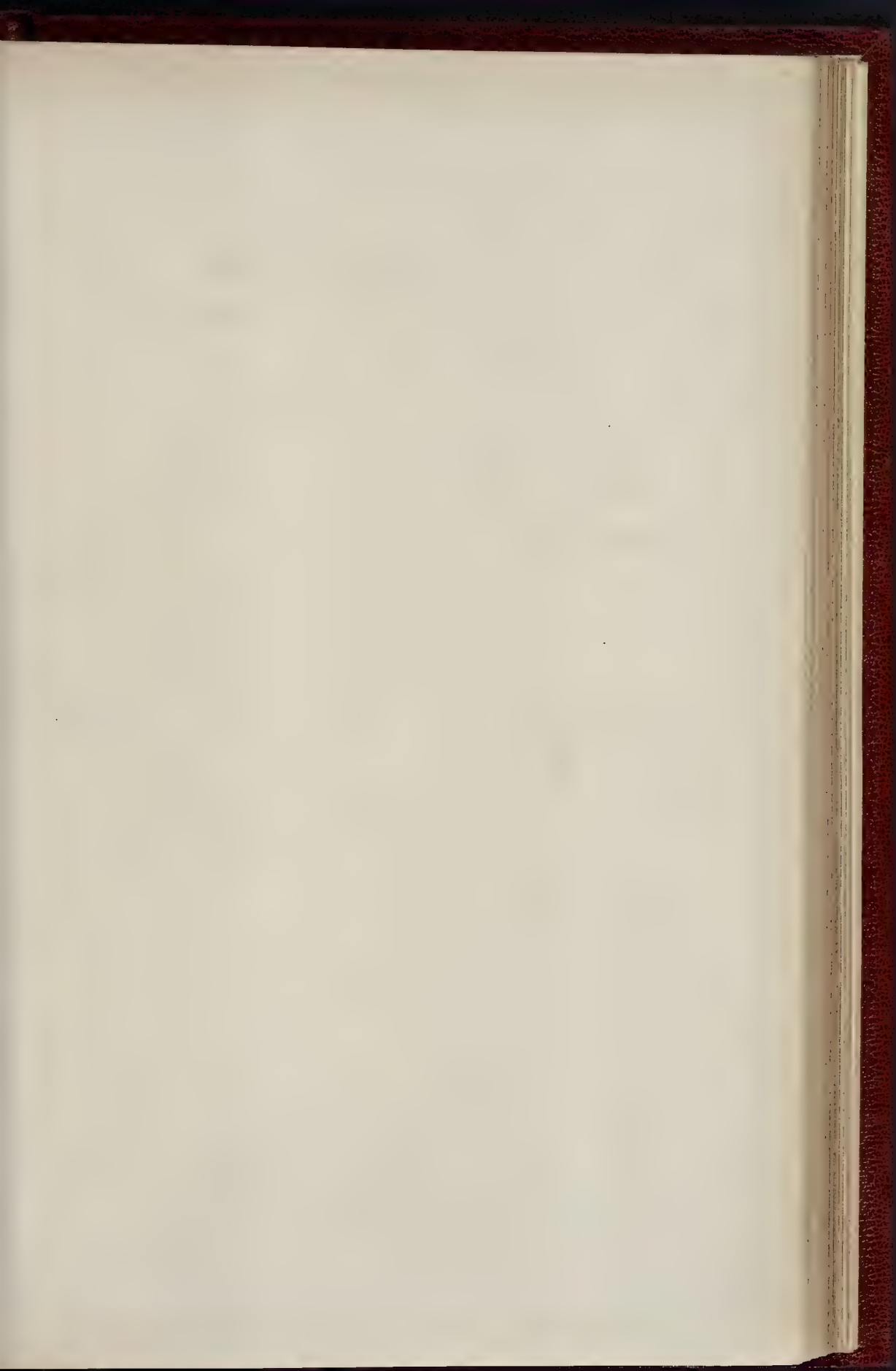


Architectural floor plan of the Palace of the Grand Duke of Lithuania. The plan shows a large central courtyard (Courtyard) surrounded by various rooms and structures. Key features include:

- Central Courtyard:** A large open space in the center.
- Rooms and Structures:** Numerous rooms, including a large hall (Hall), a library (Library), a chapel (Chapel), and a kitchen (Kitchen).
- Entrances and Gates:** Several entrances and gates are marked, including the main entrance (Main Entrance) and a gate to the courtyard (Gate to Courtyard).
- Defensive Features:** The plan shows a fortified structure with walls and towers, typical of a palace or fortress.
- Orientation:** A compass rose is located in the upper right corner, indicating North (N) and South (S).

The plan is detailed with architectural symbols and labels in Latin, providing a comprehensive view of the palace's layout and structure.

CATHEDRAL PLANS
ILLUSTRATING PAPER READ AT THE ARCHITECTURAL ASSOCIATION,
BY MR. A. BERESFORD PITE.



THE BOULDER, MAY 10, 1864

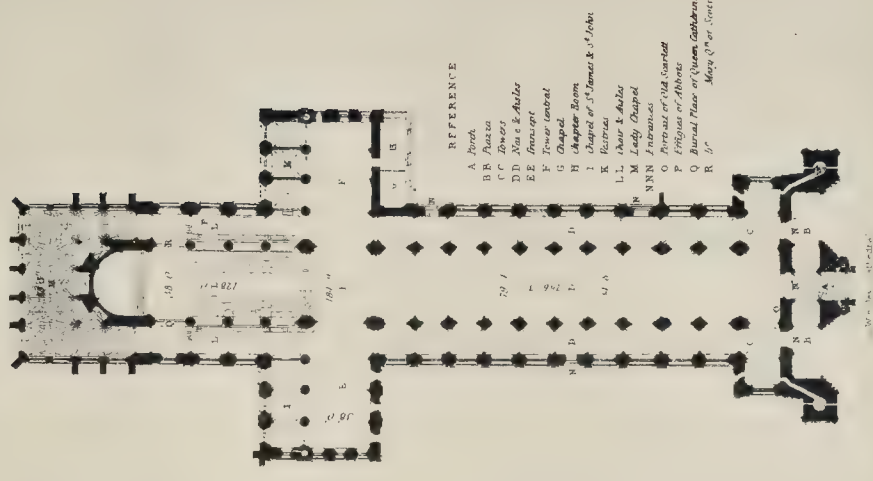




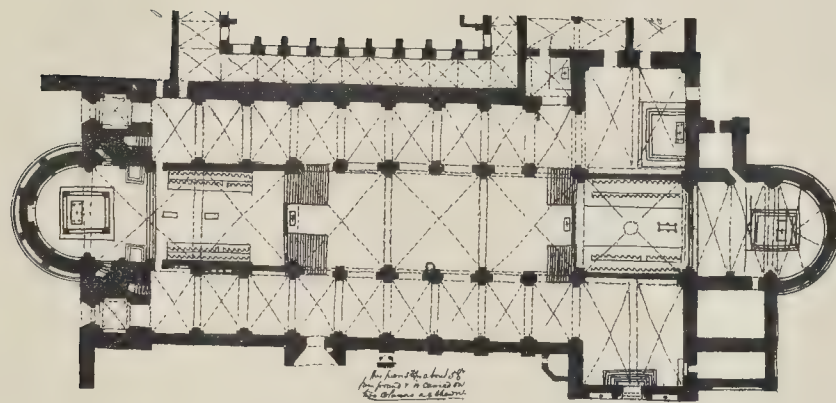
SCULPTURE AT THE ROYAL ACADEMY.

NO 1 LADY GODIVA: MR. C. B. HERT, A.R.A. SCULPTOR.

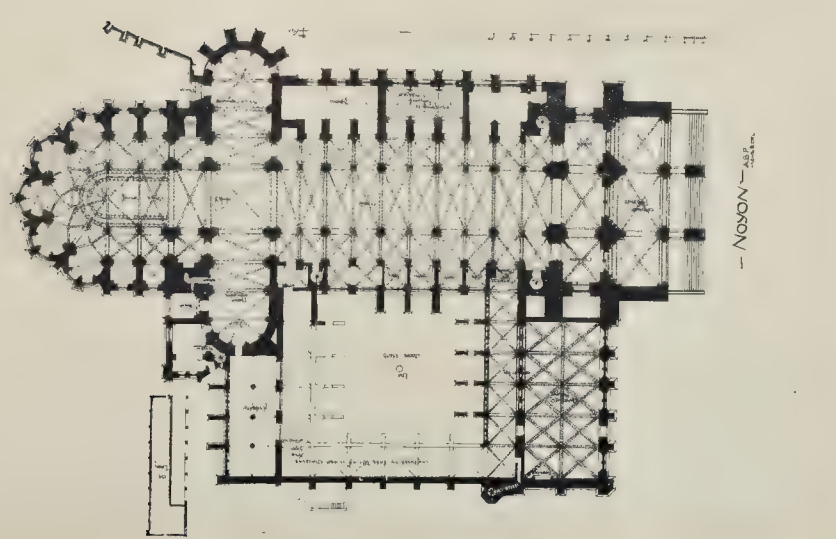
From an Original Sketch by the Artist.



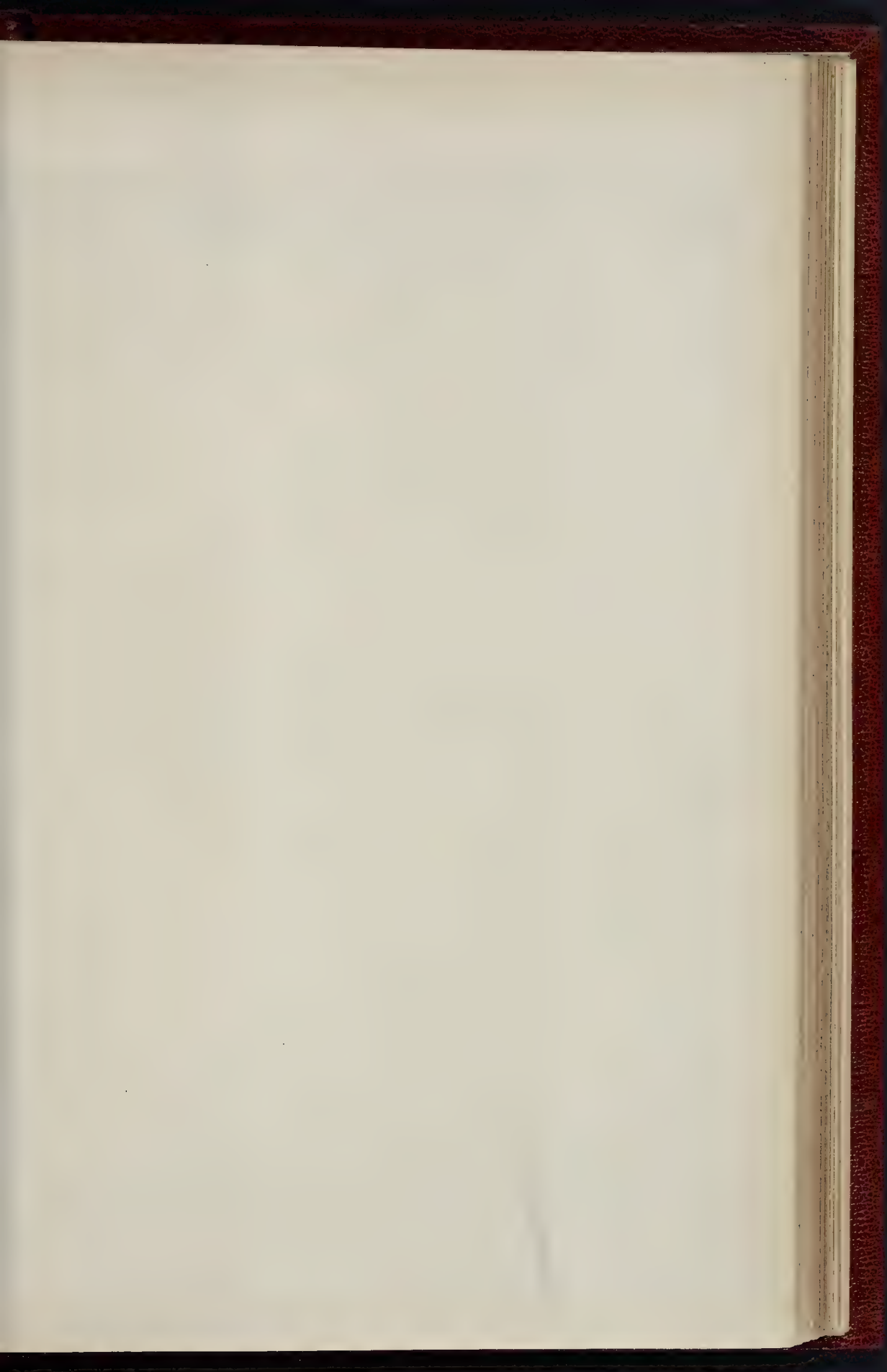
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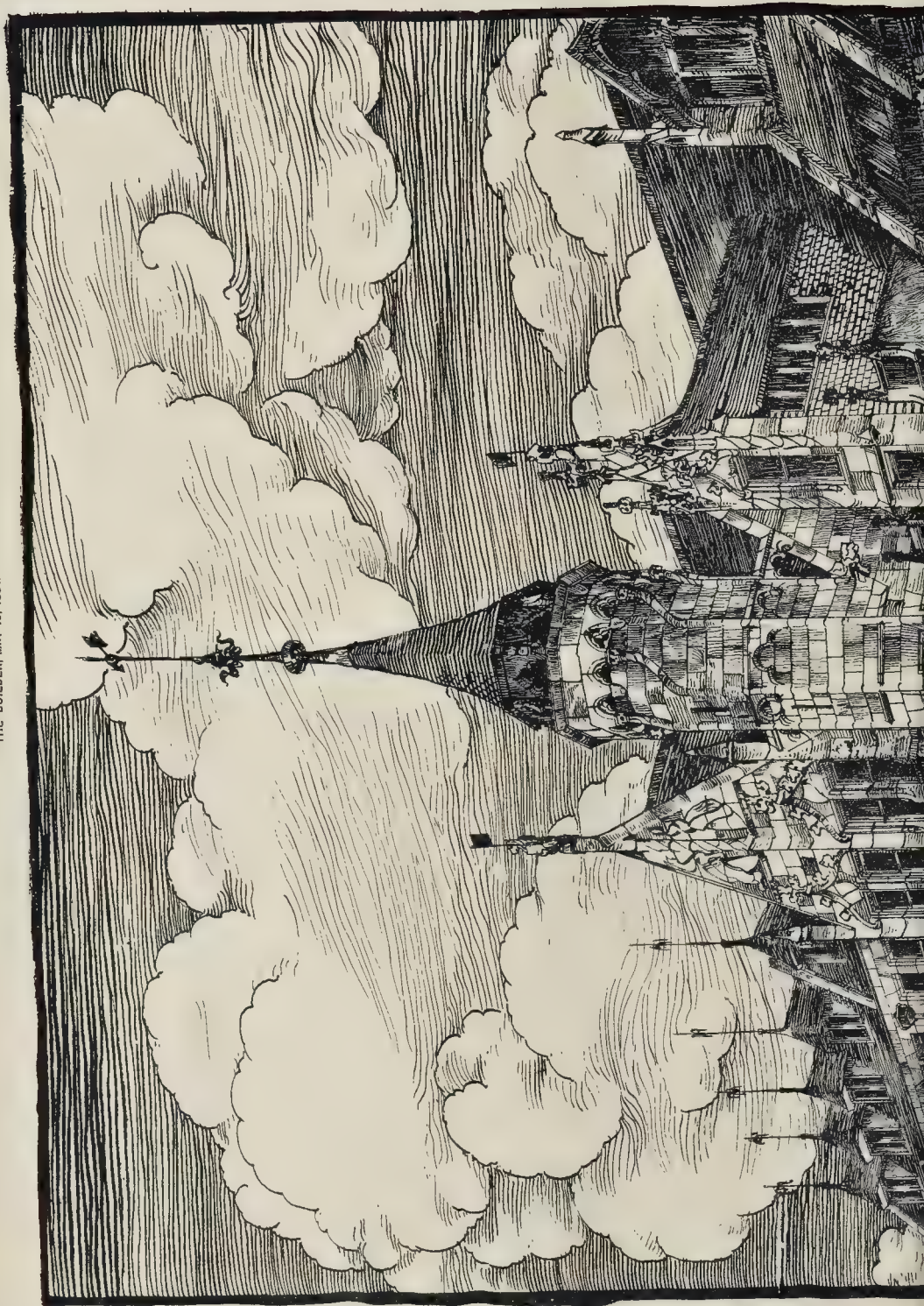
BAMBERG—H. W. K. MARTIN, MENS. & DEL.



8 Castle St. Holborn London E C



THE BUILDER, MAY 10, 1884.





C. F. Keil Photo Lith. & Printer

A. Baresford Pte. Co.

NEW WAREHOUSES, WOOD STREET, E.C.

Engineers & Builders, London, E.

MESSES. J. AND J. BELCHER, F.R.I.B.A.
Architects.

MESSRS. RYLANDS & SONS' NEW PREMISES, WOOD-STREET.

The illustration furnishes a view of a portion of the premises being erected by Messrs. John and John Belcher, for Messrs. Rylands & Sons, Limited, in Wood-street. These buildings have also extensive frontages in Philip-lane and London-wall, which have been in course of erection since the great fire at Christmas, 1882.

Owing to light and air complications, the height of the premises in Wood-street is arranged at different levels. Advantage has been taken of this to form a central feature, and artistic grouping by the introduction of a turret and projecting clock, which break up the sky-line and mark the position of the principal entrance. The fronts are being executed in red Mansfield stone, and the whole of the work carried out by Mr. F. W. E. Braid, of 6, Beaufort-street, Chelsea, and the carving by Mr. T. W. Seale, of 42, Thurlow-street, East-street, Walworth.

THE ARCHITECTURAL CONFERENCE.

(Continued from our Supplement.)

STREET, BURGESS, AND VIOLET-LE-DUC.

In the discussion which followed the reading of the three papers by Mr. Beresford Hope, Mr. Aitchison, and Mr. Wethered,

The President (Mr. Christian) remarked that all those present would heartily join in passing a vote of thanks to Mr. Beresford Hope for his great kindness in drawing up the paper. It was quite exhaustive of the subject. By the death of Mr. Street they had sustained a loss which they could not all fail to lament. The only exception he could take to the paper was that in it Mr. Street was credited with the restoration of Carlisle Cathedral, which he (the Chairman) carried out. The only work which Mr. Street did in regard to the restoration was the erection of a roodloft, and also, the Fraternity. He had no observations to make in regard to the other parts of the paper, but he was very glad to find that Mr. Beresford Hope stood up so stoutly for Mr. Street with respect to the Law Courts, of which so much had been wrongly said.

Mr. Aitchison observed that he could not allow so eloquent a paper as that which had just been read to pass without saying a few words. Had he had an opportunity of analysing the paper beforehand he would have been prepared with something more to the purpose, but he would endeavour to state the sentiments which had been evoked by the very brilliant tribute which had been just paid to the great Frenchman. No one could feel more than he did that M. Viollet-le-Duc was one of the most extraordinary men of his generation. He appeared to have combined a rare talent as an architect with that science and constructive instinct which were to be found in very few persons. A countryman of his was present, M. Chas. Lucas, who, he hoped, would say a few words on that occasion.

M. Charles Lucas, addressing the meeting, said:—"Monsieur le Président, Messieurs,—Je demande la permission d'exprimer tout l'intérêt que j'ai pris à entendre les trois éloges qui viennent d'être prononcés, et je désire rappeler brièvement les souvenirs qu'ils ont réveillés en moi. M. Street, était bien connu en France, ne serait-ce que par l'Eglise américaine de Paris et le beau projet qu'il envoya au Concours de l'Eglise Notre-Dame de la Treille, à Lille, et je me rappelle la visite qu'il me fit faire en 1878, de sa grande œuvre alors en cours d'exécution, vos New Courts of Law. Quant à Burgess, j'assistai, à ce même voyage de 1878, à la fête toute intime qu'il donna à quelques amis pour l'inauguration de son habitation, et là, à même ses cartons d'études, dans cette demeure si personnelle, j'ai pu apprécier toute sa verve de dessinateur, toute son originalité d'artiste. Mais, Français, je veux surtout vous remercier du grand honneur qui vient d'être rendu, dans cet Institut Royal des Architectes britanniques, à un maître français, à Viollet-le-Duc, un maître très-discuté, même en France, mais qui a laissé deux livres imprimés, à "Le Dictionnaire de l'Architecture," et de le "Dictionnaire des Arts du Moyen-Age."

Professor Kerr said it seemed to him that the three papers which had been read, taken as a group, were calculated to elevate and improve their minds more than any contributions that he had ever before heard presented to that Institute. Differences of opinion sank into insignificance before such an eulogium as had been delivered in either case by the eloquent speakers and writers who had taken for their subjects their distinguished friends Street and Burgess, and their equally—he did not say more—distinguished friend, Viollet-le-Duc. He felt that they were mostly men of business whom he saw surrounding him, but when they came to that room on such an occasion as the present they were shut out of the vulgar and sordid world. He had listened with particular pleasure to the eloquent and dignified periods of Mr. Beresford Hope, whose language, when he chose to make it so, was always especially pleasing, especially practical, and especially suitable to the subject under discussion. They had also listened to their dear friend Mr. Aitchison, who was always so exceedingly pleasant in every way. While Mr. Beresford Hope exalted the character of their dear friend Mr. Street,—for they might use that term in regard to him,—Mr. Aitchison spoke to them in his felicitous way of his friend and their most amusing companion, Burgess, who had left them, and they found in Mr. Wethered an enthusiasm which raised them up to the grandest thoughts, and it seemed almost a profanation to ask any one to do more than to say, as he did, that the subject of the papers was beyond their discussion. He was proud of the Institute, and he hoped they would benefit by what they had heard that night.

Professor Kerr then announced that the Lord Provost of Aberdeen was present, and expressed a hope that he would address a few words to the assembly.

The Lord Provost of Aberdeen (Mr. James Matthews, architect), said he could assure them that if he had believed his name would have been so prominently brought forward, he should have thought several times before he had ventured to put in an appearance on that occasion. He would say, however, that he had experienced a treat which did not often fall to his lot, situated as he was in one of the Northern towns of the Kingdom. It was not often that he could be present at those meetings, or he would be a regular attendant. He looked back with pleasure to the few years that he spent in London in his youth, and he might say he was proud of having been in the two offices in which he spent the greater portion of his time in London. He was in the office of their esteemed friend, Mr. Donaldson, and it was with a feeling of great pride that he referred to the fact that when he came to London as a poor clerk, Professor Donaldson took him into his office. He looked back with much pleasure to that time. He had seen him in Scotland since, and Professor Donaldson had not forgotten the poor young man whom he had assisted and befriended. The next office he was in was that of Sir George Gilbert Scott, and he was several years with him, sitting next to Mr. Street. He spent those years there not only with pleasure but with profit. He had been long removed from this centre of everything that was great, but he had often felt, though he had no reason to complain of any want of success in the northern town where he resided, that it would have been a satisfaction to him to have spent his days in London. He felt it a high honour to be raised to his present position in so important a town as Aberdeen, with its 110,000 inhabitants, and he felt that this honour reflected on the profession. He believed he should be able to exert some influence in obtaining an important Improvement Bill for Aberdeen, and he sincerely hoped that he should be able to do something for the town which would leave its mark, during his three years of office.

Mr. R. Phené Spiers, F.S.A., observed that he should have occasion in the paper which he was to read on Friday, to say a few words with respect to Mr. Street, and he, therefore, would not further refer to him on the present occasion. Of Mr. Burgess he had an intimate knowledge, and he had enjoyed the immense advantage of his teaching. Long before he was an Associate he had frequent conversations with him as to the course he should adopt. From a close and intimate acquaintance he was one of the few who had influence with Mr. Burgess. The numerous works published by him would exercise greater influence than per-

haps those of any other architect of the present day or century. He also knew M. Viollet-le-Duc, and had the pleasure of staying with him a few days at his château. M. Viollet-le-Duc had one sorrow in that he was not able to influence French architecture so much as he could have liked. The traditions of the Academy were too powerful for him, but he had a great number of subscribers among the French students, although they did not see their way to reproduce his ideas. Mr. Spiers concluded by moving a vote of thanks to Mr. Beresford Hope, Mr. Aitchison, and Mr. Wethered, for their papers.

Mr. J. P. Seddon begged to second the resolution, and he did so with hearty zeal. They had had a great treat that evening. The three men of whom they had heard so much were men of rare qualities, which placed them among the most distinguished men of the age. The subjects had been treated in a most admirable manner by the respective writers. They had had the dignified characteristics of Mr. Beresford Hope, the charming manner of Mr. Aitchison, and the great enthusiasm of Mr. Wethered. It was a great satisfaction to him to be able to say that he, like Mr. Spiers, had known all three men. With regard to Mr. Burgess, he was his intimate companion; he loved the man exceedingly, his fun was unbounded, and one point which was very noticeable was his great generosity to the other members of the profession. He was always ready to give those who asked for it the benefit of his knowledge of medieval architecture. The style which those three men had learned and taught was not fashionable now; they were drifting to another style; but it was not by forgetting the glorious structure of the Middle Ages that a new art was to be formed.

The Chairman, in closing the discussion, said he was sure they had had a most charming evening, and also a most profitable one. He quite agreed with what had been said on the subject by Professor Kerr. It had been one of the most enjoyable meetings he had been present at for a very long time. They had had the reviews of the careers of three of the most powerful workmen of this century. Street, as they all know, was a giant in his day; Burgess was hardly less an one, for he was one of the most thorough men of his day; and, as for Viollet-le-Duc, there was hardly anything he did not make himself acquainted with in architecture. He was master of almost all that science and art could teach him. These papers had been so excellently shown in them, as to be thoroughly refreshing, and he was sure they would, by acclamation, give their most hearty thanks to the composer of each of them.

Professor Kerr said there was one formality which had been forgotten on Monday evening, and which he would endeavour to supply by moving the following resolution:—

"That this meeting desires to offer to Professor Donaldson their congratulations to himself personally on the interesting occasion of the fiftieth anniversary of the foundation of the Royal Institute of British Architects, in which he took so important a part."

They all knew how kind and friendly Professor Donaldson had been to all who had ever come in contact with him. On one occasion, when about to start for Italy, he went to him for a letter of introduction. He found his manner quite charming, and the letter he gave him proved of the utmost importance to him.

The Chairman put the resolution, which was carried by acclamation.

VISIT TO GUILDHALL.

ON Tuesday morning the members and visitors assembled in the old Council Chamber, Guildhall, at 10.45 a.m., where they were received by Mr. Horace Jones, the City Architect. Here was displayed a large coloured interior perspective drawing of the new Council Chamber, and other drawings. Mr. Horace Jones conducted the members to the new Council Chamber, which he described. He said it was a twelve-sided chamber, planned on the principle of the ancient chapter houses, for acoustic reasons. A circular chamber would prove too much of a speaking or whispering gallery, that would destroy the effect intended, viz., that of enabling every speaker to be distinctly heard. He next gave some general descriptions and details, which were practically the same as those given in the *Builder* of a few months ago,

when we published a double-page view of the interior (December 1st, 1883).

We may, however, recapitulate to some extent. The dimensions of the building, as shown by the drawings, are as follow, viz.:-

External diameter	ft. in.
Internal diameter (within screen)	78 0
Corridor in clear	54 0
Internal height from floor to dome	9 0
Bitto to top of lantern	81 6
External height to vane	100 0

The entrance for the Lord Mayor will be from the dais at the eastern end of the Guildhall, and his chair will be placed at the east side of the chamber, and on his right and left will be seats intended for the twenty-five Aldermen and also for the two Sheriffs, the Recorder's chair being immediately at the Lord Mayor's right hand. Sitting accommodation for all the commoners (206 in number) is provided, the seats being ranged concentrically on a rising stage, giving each member his own definite seat, as is now the case with the Aldermen in the Court Room. The arrangement for taking divisions will be for the "Ayes" to go out at the door on the Lord Mayor's right, and the "Noes" at the door to his left, the numbers being taken by the tellers situated at the two turnstiles, the members returning to their respective seats by the western doorway, and passing the bar of the Court. Immediately in front of the Lord Mayor (and at a lower level than his chair) will be placed the table for the officers. In the centre of the chamber will be a table for the exhibition of plans, papers, models, &c., and immediately opposite to the Lord Mayor will be the City Seal and the bar as at present, with considerable additional space for petitioners. The entrances for the Lord Mayor and Aldermen, for the members of the Common Council, and for the public, will be all distinct. The members will enter at the west side from the corridor which now leads to the present Council Chamber. The accommodation for the public will be provided in the gallery; they will have access to this gallery by stairs perfectly distinct from the members' entrance. Though doorways are provided, these would not be opened unless under special necessity. The corridor surrounding the Council Chamber will afford convenient space for members to converse with one another without disturbing the business of the Court, from which it is divided by a glazed screen. Accommodation for the Press will be provided in the gallery over the Lord Mayor's chair. The floor under the Council Chamber will afford good office accommodation, and in the centre of this lower floor will be the access by a staircase to strong rooms situated in the basement. The elevation of the exterior of the building is of a style to harmonise with the Guildhall and Library.

The corridor which surrounds the chamber will, it is believed, afford a ready means of control over the temperature and ventilation of the Council Chamber itself, for if the temperature of this corridor is maintained at from 59 to 61 degrees, no great difference should be felt between that temperature and the temperature of the Council Chamber itself (especially as the use of gas will probably be eventually avoided), thus affording a means of introduction for fresh warm air into the chamber without appreciation of unpleasant draughts. The dome being of two thicknesses will prevent the solar heat affecting the temperature of the Council Chamber, whilst at the same time affording a ready means for the extraction of vitiated atmosphere, and for which, as well as for the introduction of fresh air (warm or cold), mechanical means are provided. Ventilation is also provided round the sides of the lantern. Mr. B. E. Nightingale is the builder.

The statue of George III. (said to be Chantry's first statue), at present in the old Council Chamber, would, Mr. Jones said, be removed to the new Council Chamber, as shown in the illustration referred to. The members next adjourned to and inspected the library, reading-room, museum, and committee-room, where they were introduced to the librarian, Mr. Overall, who described these portions of Guildhall, and said there were lying on the table some ancient books and manuscripts, and particularly, the original map of London, by Aggas, which objects of interest were minutely inspected by those present. The whole party then proceeded, under the conduct of Mr. Gruning and Mr. J. Douglas Mathews, to the new Stock Exchange, Old Broad-street.

VISIT TO THE NEW STOCK EXCHANGE (EAST ADDITION).

A LARGE number of visitors subsequently assembled in the new reading-room of the Stock Exchange, which occupies the greater portion of the ground-floor next Throgmorton-street. Here they were received by Mr. John J. Cole, the architect of the building, who explained the working drawings. The ground plan consists of large octagonal hall, which is 68 ft. span, and covered with a large circular dome of iron and glass 70 ft. diameter clear, and 52 ft. from floor to the springing, giving a total height of 110 ft. to top of cupola. Mr. Dawney, C.E., of London Bridge-house, has constructed the ironwork to dome and trusses, and supplied the other constructional ironwork. Mr. Cole said the new Stock Exchange was rendered necessary through the old one proving inadequate.* The old Stock Exchange contained about 8,000 superficial feet, and the new one about the same quantity, so that when the two were added together, which it was intended to do by pulling down the east wall of the old Stock Exchange, the two would become one large hall of 16,000 superficial feet. The present contract is undertaken by Mr. George Shaw, builder, of Westminster; and the amount of the contract is £80,000, exclusive of granite to piers and portion of excavation. Mr. Richard William Payne is the clerk of the works, and Mr. Miller principal foreman to the contractor. The walls of the building throughout are constructed with best Gamlingsay gault stock bricks in Portland cement. The piers and pendentives are built in blue Staffordshire bricks and Portland cement, and bonded with hoop-iron each course. The whole of the external walls, where not of stone, are faced with white glazed bricks. The external dressings are of Portland stone. The pilasters, angle quoins, and frieze to north front are of Shap granite from Messrs. Feunings quarries. The whole of the internal granite has been supplied by Messrs. Fraser & Son, of Broadford Works, Aberdeen. The interior of the large hall, which attracted much attention from the visitors, is faced up to main cornice with polished Pavonazza marble, built in as part of the work in 2 in. and 4 in. thicknesses alternately. The pendentive are faced with Aubigny stone up to upper cornice. Besides the large hall, the ground-floor contains two transepts, 22 ft. wide each; two side aisles, 15 ft. wide each; two semicircular apses, vestibule, members' washing and reading rooms, post-office, and other offices, the whole being approached by the principal entrance from Throgmorton-street, and two other entrances from Old Broad-street. The principal entrance is lined with a deep granite plinth or dado, and polished Plymouth marble above dado to Portland stone cornice; the ceiling here is panelled in Portland stone resting on cast-iron ornamental girders. The walls of the vestibule and small lobby are lined with Ippelen marble plinth, and Plymouth marble dado 4 ft. high, and from dado to ceiling with Sicilian marble. The ceiling is executed in Hitchens' patent plaster finished in Martin's cement. All the other ceilings throughout, where of plaster, are also finished in Martin's cement. The steps and landings in front entrance, and to principal staircase, are laid first solid Craigleith, then 1½ in. loose Craigleith treads for easily replacing when worn out. The staircase walls are lined with light Ippelen marble dado, and Pavonazza marble above the same to cornice. The ornamental cast-iron balusters by Messrs. Cooper & Son, of 121, Drury-lane, are surmounted by a mahogany handrail.

The total area of the new Stock Exchange on ground floor is 16,000 superficial feet. We understand the east wall of the old Stock Exchange will shortly be taken down on the completion of the new hall to unite the two buildings. Besides the principal staircase there are other staircases leading to the settling-room and to the settlement departments, the former covering the area under the large hall, and the latter occupying the second and third floors of the north building. The principal staircase leads to the large committee-room, secretary's offices, manager's room, and other offices. The visitors having returned to the reading-room, unanimously passed a vote of thanks to Mr. J. J. Cole, who, in replying, expressed the hope that, when the new Stock Exchange was com-

pleted and the buildings united, they would all come again and see the effect. In Mr. Payne's, the clerk of the works, office was shown a quantity of pottery, which, together with coins and other Roman relics, were discovered on the site by Messrs. Brass, when excavating for portion of the foundations.

VISIT TO THE UNDERGROUND RAILWAY.

THE visitors next proceeded to the works of the Inner Circle Completion Railway. The progress making with this remarkable piece of engineering from Mansion House Station to the Tower is very rapid, the tunnel having for some time been completed. The laying of the rails and the building of the stations are the remaining work to be done. These are advancing by noticeable strides even from day to day; and in a short time the trains will pass along the subterranean way. The history of how that way has been made will be very interesting to others than engineers. The whole distance runs under the busiest centre of the largest and busiest city in the world, and it is claimed that all the many operations of construction and excavation have proceeded without serious injury to any one or interruption of business or traffic. Portions of the line have passed through quicksands and former river beds; other portions under lofty warehouses and stately edifices; others under streets through which the movement of vehicles and pedestrians never ceases from morn to night. The whole of the shops and houses in Cannon-street have been underpinned and the concrete supports carried down 30 ft. on and into the tertiary clay. The old Wall-brook has been carried under the tunnel into the Low-Level Metropolitan Sewer: the former district sewer from Walbrook to King William-street has been divided and flows in two culverts, one on each side of the new railway, and the City sewer running towards London Bridge has also been rebuilt at the lower level required by the exigencies of the line. All the branches and house-connections required have been duly made: gas mains and water mains have been held up by timbering for a time and then built up to supported from below. And all these subterranean operations have proceeded for the thousands upon months without cognisance by the thousands of inquisitive minds who have ceaselessly passed over the workers below. The general dimensions of the underground tunnel are 26 ft. 3 in. in width; 21 ft. 8 in. from centre of the concrete invert to the soffit of the arch; and 18 ft. is the distance between the centre of the covered way and the plane of the rails. The general system of execution, as, for instance, in Cannon-street, where the course of the line and the street corresponds, has been to cover over the road with planking; then to dig a trench on either hand and put in the side walls; next to build the arch over on wood framing resting on the undisturbed ground; afterwards to excavate the solid earth; and, finally, to construct the concrete invert with its longitudinal central drain. The same fundamental system, modified by circumstances, has been adopted for other requirements.

The most extraordinary proceeding in the whole of the undertaking has been the undermining of the colossal statue of King William IV. and the construction of the tunnel below without removal or disturbance. The weight to be dealt with was no less than 170 tons, and the statue now rests entirely upon the crown of the arch of the tunnel. The old foundations of the pedestal of the statue,—round in form,—stood right in the path of the railway, and were composed of lime-concrete filled in upon the ancient inequalities of the ballast ground. The east and the west sides of these foundations were cut away, and two rectangular legs of Portland concrete, 9 ft. by 4 ft. in section, were built in from beneath the stone pedestal down to the London clay at a depth of 40 ft. The support of the statue being thus transferred, a heading was driven through the top of the central portion of the old foundations and the crown portion of the tunnel-arch built through and upon the excavation. This being done, the upper parts of the legs were similarly excavated, and the corresponding crown portions of the arch turned over. The side walls being erected the lateral portions of the tunnel-arch were constructed and made good with the central portions. All obstructions to the course of the line were then cleared out of the way, the thick-

* For notes on the history of the Old Stock Exchange see Peter Cunningham's "Handbook of London."

ness of the supporting crown of the arch being eleven rings of brickwork, or rather over 4 ft. in thickness. Another remarkable undertaking was the carrying of a skew arch under the lofty warehouses in St. Thomas Apostle. Here four concrete pillars were made to support the buildings, the side-walls of which were first cut out to admit the execution of the central section of the arch; lateral portion of the arch being subsequently built up to it. The traffic in the streets generally was, of course, kept from interference by the laying down at nights of sections of wood planking after the common practice of contractors. But there is nothing of the kind on record to compare with the magnitude of the undertaking, and the despatch used in the case of the fore court of the South-Eastern Railway and Hotel. The railway traffic could not be permitted to be barred, and the only interval available was that between the despatch of the Paris night express and the time of starting the early morning trains. Three hundred men and all the materials were got ready for the occasion; and, so soon as the Continental train had left on its journey, the workmen commenced simultaneously over the whole area. The stone paving was removed. Timber banks were placed at the proper distances on the ground, and thick planking was laid and crossed over them; and, when the station doors were opened in the morning, the fore-court was paved with wood, and the engineer's requirements accomplished. The upper world being thus shut out from the lower world the contractor went on his subterranean way in peace and isolation. Headings were driven under this paving-roofing, and struts were put in beneath the timbers. The burrowings in the earth went on and galleries were formed for the intercommunications of the workmen. Pits were sunk to the depth required for the pillars to support the future iron roof of the underground station; blocks of Bramley Fall stone were lowered down into place for these foundations; the iron pillars themselves followed. Iron girders were brought in, and these are being lifted into position by hydraulic jacks working still upon the top of the solid ground in the galleries beneath the wood paving of the forecourt. These girders as placed are being riveted up to the iron pillars and connected with the supports upon the side walls. So the underground station is being built underground, embedded in the solid earth. Visitors now wander amongst deep iron plates and iron pillars, some still embedded, others more or less exhumed; and as the earth is excavated more and more of the finished station becomes revealed. The general operations in the execution of the stations are similar in every case, and all are advancing well towards completion. That at Fish-street-hill is almost ready, Seething-lane is two-thirds advanced, and Cannon-street is half done. All the stations are of the same type, being entirely underground, about 350 ft. long, with rows of iron pillars parallel with the platforms supporting the roads, warehouses, and edifices above. In width they are from 50 ft. to 70 ft. The booking-offices will be light buildings, above ground, except in the case of Cannon-street, where there will be an ornamental staircase, leading direct into the subterranean station, which will be immediately below the front or street boundary of the courtyard, formerly occupied by a flight of steps and a row of pilasters. The tunnel and the stations form together a continuous covered way, the ventilation of which will be provided for on the same principle as in mines, by two powerful fans, to be worked by steam-engines. The one being under the house No. 8, Cannon-street, and the other in Little Tower-street. Lofty brick shafts in each instance will be erected, and will throw off the steam from the locomotives, and the contaminated air high above the tops of the adjoining houses. The engineers of the line are Sir John Hawkshaw and Mr. J. Wolfe Barry; the resident engineer is Mr. Seaton. The contractor is Mr. T. A. Walker, of Westminster, for whom the work is being conducted by Mr. Wardhaugh, whose extensive experience in the execution of former sections of the Metropolitan Inner Circle Railways has been of the greatest value. At the rate of progress which is making, there is good prospect of the opening of this great undertaking not being much, if at all, delayed beyond the month of July next, as originally contemplated.

VISIT TO THE ROYAL ARCHITECTURAL MUSEUM.

A VISIT was made to the Architectural Museum and School of Art, Tufton-street, Westminster, on Wednesday afternoon. The visitors were received at 2 p.m. by Mr. J. P. Seddon, who read a paper giving a general and chronological description of the principal objects of interest there, commencing with the beautiful marble reliefs from the ruins of one of the ancient capitals of India, situate in the desert of Rajpootana, circa 1100, presented to the Museum by Sir Bartle Frere. Mr. Seddon rapidly referred to the many objects exhibited, and pointed them out to the visitors. He drew special attention to the collection of Venetian and Veronese casts presented by Mr. Ruskin, and said "those who would read the 'Stones of Venice' should first come here and see the casts." Mr. Andsley proposed and Mr. Lucy W. Ridge seconded a hearty vote of thanks to Mr. Seddon, and also to Mr. Randall Druce, the curator, who subsequently read a paper on the progress of the School of Art in connexion with the Architectural Museum, and on schools of art in general.

We have thus brought our report of the proceedings of the Conference down to Wednesday evening. Of the Visits made on Thursday and Friday, and of the papers and discussions at Friday's meetings, we will give a report in our next.

ART APPLIED TO COACHBUILDING.

This was the subject of an interesting paper read at the Westminster Town Hall, on the 30th ult., by Mr. Henry Julian, of Bolton, before the members of the Institute of British Carriage Manufacturers. We quote a few passages:—

A carriage is a highly complex production. From one point of view it is a piece of mechanism; from another, a work of art, and is good or bad, a success or a failure, as it possesses the characteristics of the latter: then it must follow that a coach-builder and an artist should have gifts and qualities of the same order and cultivate them by the same means; that is, he should have a hand made deft by practice, capable of doing the finest and most delicate work, and an eye educated for proportion, form, and colour. If this be so, and I think no one will doubt it who knows anything of the art, no coach-builder can produce the highest results who has not made himself conversant not only with the principles of construction, but also with those of art. No one denies that the first demands study and experience, but there are very many who think that they have an intuitive knowledge of what is fitting and beautiful, and therefore that it would be a waste of time on their part to study what has been done by the potter, the sculptor, and the artist, with the view of transferring the graceful lines and harmonious colours of vase, statue, or picture to their work, and yet to attain to efficiency in the one demands less time,—a lower standard of mind than the other. An artist or a sculptor is not the product of a day, he is eminent only in proportion to the time and thought he gives to his work, and what is necessary to him is necessary to us. A word or two will make this self-evident. The three essentials of a work of art, are proportion, form, and colour, and these are the essentials of a good carriage. A knowledge of them does not come by intuition. They are inseparable from experience, culture, and taste. The eye must be educated so that it shall detect at a glance when one part is too large for another, and when one part, not only is, but looks strong enough for the weight it has to bear. This seems very simple; but were it as simple as it looks, it would not be violated as often as it is. Sometimes we see a quarter panel out of all proportion too large for the door, and rockers unusually deep to admit of the upper panels being shallow, with a view of producing a light appearance, but in reality giving prominence to a part that should be concealed as much as possible. At other times, the neck of the boot so narrow as to awaken the feeling of insufficient strength in that part, and a seat so top-heavy that it looks as if it got there by mistake.

It is no uncommon thing to see seats and swing bars that strike you as being too heavy, and tongue pieces and runners as too light to give

any support to the wheel-plate, and blocks and fellow-pieces so deep that you are forced to conclude that the carriage-maker worked by the rule of thumb. Occasionally we see springs made of such narrow steel that the number of plates have to be doubled, thereby decreasing their elasticity and increasing their liability to overlap and break, and wheels of such slightness as to suggest extreme frailty and danger to the occupants of the carriage. No one will doubt that these are defects,—defects that detract considerably from the appearance of a carriage, and that would not be tolerated in the work of a man of sound judgment and good taste. If a carriage be not of good proportion, all the finish that may be lavished upon it afterwards cannot condone this defect. It is as offensive to the educated eye, as a badly-drawn figure in a picture, however brilliantly it may be painted. Unfortunately, proportion is not a thing that can be settled by compass and rule. It is purely a matter of experience and taste. If a man cannot see it for himself,—you cannot always show it to him by saying it lies here or there. Proportion is perfect balance of parts,—when the eye is satisfied, and you cannot detect the relationship that one part bears to another, then you have proportion,—proportion that is as true as it is beautiful.

Beauty of form, that is, graceful, flowing lines, or what we call "unbroken sweeps," are as essential to a carriage as they are to a vase or bust. Until lately there was a wide-spread idea in the trade that drawing was not an essential accomplishment for all. It was even assumed that a body-maker could do his work satisfactorily without it. No doubt he could do it soundly, and if supplied with a full-sized drawing of the side elevation, could make a body without any very noticeable defects; but a large number of masters cannot draw, and do not, or cannot, afford to keep a draughtsman, and to expect under such circumstances that men without a knowledge of drawing can produce what is either graceful or beautiful, is to expect an impossibility. The hand that cannot trace a beautiful curve cannot make one. You might as well expect the colour-blind to out rival a Turkish carpet or a Moorish scarf. A knowledge of drawing,—fresh and mechanical,—is indispensable, for without it truth, grace, and beauty are unattainable. No doubt all do not possess the necessary gifts; but many possess them unknowingly, and nothing but trial will prove who has them and who has not. We cannot afford to let this class of talent run waste. At best it is not an unlimited quantity, and we must conserve and develop what we have, if our products are to be as remarkable for beauty as they are for constructive skill.

Very few of our customers know anything of the construction of a carriage,—they are influenced by the general effect; that is, they are pleased with a carriage as it realises their conceptions of ease, grace, and harmony. Then it is important for us to discover how this end may be attained. Above all, I should say, by paying strict attention to form; that is, by taking special care in designing a carriage that one line shall spring naturally from the other, and that all the lines, when combined, shall be graceful and flowing; that no part shall have more than its due amount of prominence; and that all ornament shall be subordinated to fitness. Short, broken lines destroy the feeling of unity,—that the design was the outcome of one mind. Unnecessary structural members are contrary to the fundamental principle of art,—that nothing is beautiful that does not serve some useful purpose,—and unnecessary or over-elaborate ornamentation destroys the feeling of repose essential to harmony. In this respect, I think English carriages superior to all others. Let any one examine a series of foreign designs from, say, ten years back to the present time, and he will see that the characteristics of the older ones are short, broken, contorted lines, defective proportion, a tendency to over-elaboration, particularly in the seat-stays, steps, wheel-irons, and pump-handles, and that these characteristics have grown less and less pronounced,—that is, these designs have become more assimilated to the chastened and simple elegance of a high-class English carriage. I do not mean to say that all English carriages are perfect. I have seen now and then monstrousities on two and four wheels made in England. I mean the carriages made by men of experience, ability, and good taste, and I boldly assert that their carriages have no equals in the world.

I confess that we are not so far ahead of some nations as we used to be.

The trimming and painting of carriages have changed little in forty years. The colours and their arrangement were much the same then as now. The darker shades of green, blue, and brown predominate at present and have predominated for some time. These colours in rep, cloth, leather, or silk, whether in the plain or fluted style, can at best be made to produce only negative results, and perhaps that is the reason why they are adopted so widely; for the lining of a carriage should be treated as a background for a lady's toilet. I do not say this is the idea that always influences the coach-builder in producing, or the lady in ordering a carriage; but that it has operated on both unconsciously I have no doubt, and that this taste for sombre colours is based upon a sound principle, that anything showy, — anything that might produce a violent and perhaps a disagreeable contrast, must be avoided. But are dark green, blue, or brown the best for this purpose? when they are it is more a matter of chance than of selection. It would not be easy to find a colour that would be a suitable background for peacock blue, bright mauve, or London smoke without marring the appearance of that part of a carriage which should be remarkable for good taste.

Coach painting has for a long time been at a standstill. It is no better and no worse than it was fifty years ago. Heraldry, that might have developed into something worthy of the name of art, owing to a stupid tax, is dying fast. Straight lines, of varying width, that often cannot be seen ten yards off, are universally accepted as the *ne plus ultra* of carriage decoration. In no other branch of manufacture would such decoration be tolerated. It is mechanical and conventional in the narrowest and most objectionable sense of the words. Surely no one believes that this must continue so,—that in straight lines we have exhausted all the possibilities of carriage decoration. I know that there are difficulties in the way, and that not the least of these is cost; for a pound less or more often causes or prevents a sale,—and we shall have to overcome prejudice and custom,—discover what will most readily adapt itself to our work,—retain delicacy of hue and brilliancy of effect when varnished; but that it can be done successfully and artistically, may be seen in Japanese lacquered articles. Their japanned work is quite as brilliant, more durable and beautiful than our painting, and admits of decoration that rivals nature in freshness and purity of tint. Here we might get some valuable hints. The process is very similar to our painting. Each coat of lacquer is rubbed down with charcoal, a finer kind being used for each consecutive surface, and the last coat is polished with the ash of deer's horns, applied with a soft leather.

We have given to our carriages the essentials,—proportion and form; but they still lack the crowning element of colour,—colour artistically applied. That must, in a large measure, be done by our painters, and if by them, their work must be the outcome of culture, skill, and taste. These qualities are only found in perfection in those who have mastered the principles of decorative art, and who know by experience how these principles may be most effectively applied. Such men are few, more, I have no doubt, from want of opportunity than from want of talent. It will be for our art-classes to develop what is latent in the rising generation of painters. Directed by men who know our needs,—stimulated by examples of the best work done by other branches of art-manufacture,—encouraged to break through the trammels of tradition, and free to give expression to their own thoughts, the result would be a style of decoration that would give to our carriages a value higher than that accorded to convenience and comfort,—that value which the refined of all ages have given to objects that harmonise with their sense of the beautiful.

Wimbledon.—A new Congregational church has been opened at Wimbledon. It has a spire 140 ft. in height. The building, which is of Godalming stone facing with Bath stone dressing, has been erected from a design by Mr. W. D. Church, architect, South-place, Finsbury. Mr. E. C. Ackermann, of Wimbledon, was the builder, and the cost will be about 6,000*l.*, including extras and fittings.

MR. HODGETTS' LECTURES AT THE BRITISH MUSEUM.

THE two last lectures delivered by Mr. Hodgetts at the British Museum are so intimately connected with each other that we have preferred noticing them together to giving a detailed account of each.

In the lecture on the "Rune," the intention of the lecturer was to show that notwithstanding certain similarities between the Græco-Phœnician alphabets and the Teutonic Futhork, there was no evidence of copying from one by the other, nor was the similarity greater than might be expected in expressions of thought in signs by members of one great family. The fact being that both Futhork and alphabet are descendants from a common stock long since extinct. Properly speaking alphabets were never invented, but had become evolved from ideographic systems long passed away, which in their turn were the daughters of some still more perfect system of representation of thought by sound, the result of a perception by man in an early stage of his history on the globe, of the congruous relation between mind and matter, which was the soul of the early myth.

The circumstances that the fundamental number of characters in the most ancient Futhork is the same as that of the letters of the early Greek alphabet, viz., sixteen, was duly pointed out, and the resemblance between the Roman B, R, and I, and the Scandinavian characters for the same sounds were dwelt upon at some length in proof of the assertion that they both were descended from a common parent. The name of each letter in the Old Norse, German, and Anglo-Saxon systems was next investigated and shown to be identical in all the Teutonic series, of which the English Futhork was the most complete, and farthest from the classic models.

There were, in this very perfect system, forty letters, by which the sounds of our copious language could be well rendered, while the more meagre Roman alphabet is quite inadequate to our wants. The peculiar wealth of vowel sounds, in which we are so rich, found an exponent in the Runes, which, besides their initial value as letters, had a mystic or inner life which had to be recognised as well. Thus the Rune for T represents the head of a javelin, which is properly called *gdr*, but it is the attribute of the god Tyr, for the initial of whose name the weapon is made to stand; so that the sight of the Rune, standing by itself, would call up the idea of the god, but in juxtaposition with other letters, it became T pure and simple. So with many others. The Rune N is called need, and it was usual for the bridegroom at a wedding to draw this knot on the nail of the bride's little finger, representing thereby the marriage knot or nuptial tie. The vowels in the Futhork are certainly very fully rendered, and Mr. Hodgetts deprecates the loss we have sustained in adopting a system so imperfectly adapted to our wants as the Roman. The difficulty of knowing what to do with a word which we meet with for the first time is a hardship which we have no right to have imposed upon us, and he referred to the modern Icelandic alphabet, in which, although the letters were taken from the Latin alphabet, certain modifications had been made which rendered it phonetic,—the *a* in ball, fall, all, &c., being represented by *Á*, with an inclined bar over it, thus *Á*; the *e* in man, can, fan, &c., by *Æ*; the long *i* in mine, ice, *i*, &c., is represented by *Í*; and the sound in it, wit, &c., by the ordinary character.

Some of the forms of the more elaborate Runes are very interesting indeed. The sign "Ethel" or "Æthel" is a picture of an enclosure, and means land, but as the possession of land conferred nobility, or was a necessary element in possessing noble rank, so the sign came to represent nobility, and the word *Æthel*, so that in writing such a word as *Æthelred*, for example, all that was necessary was to write the Rune in question, and the letters "e d" after it. Alone it stood for land or country; so with the rune ING, a termination of constant occurrence in Anglo-Saxon, we have a representation of a field,—"*ing*" (Swedish "*äng*") meaning a field; but when used as a suffix, it was only the syllable "*ing*."

It is historically true, that with the religion of Rome we adopted the character of the Latin alphabet; but although Latin killed the

Runes, they lived on into ages more familiar to us than the early times of our own kin. They were not forgotten in the first periods of the Norman usurpation, and at an earlier time, when we should least have expected it, we find a Christian poem cut in stone in Runes. In the very period when we must have supposed that the ecclesiastical fury of the Rome-aping priesthood would have exhibited the greatest repugnance to the use of the forbidden signs, we find a portion of a poem resembling Caedmon's paraphrase, cut in Runes on the celebrated stone cross at Ruthwell, in Annandale. It is supposed to be of the seventh century. Another cross at Bewcastle, in Cumberland, was raised in honour of King Alclred, who, conjointly with his father Oswin, reigned in the kingdom of Northumbria, and who died in the latter half of the seventh century. The words are:—

Se ðis sighecun	This memorial
Sette Hwætred	Hwætred set
em gærfce holdu	and carved this monument
after bare	after the prince
Xmb cýning Alclredæ	after the king Alclred
giegead heosum swulum.	pray for their souls.

There is a cross at Collingham (Yorkshire) supposed to be erected to King Oswine, who died in the middle of the seventh century, when Christianity was fairly established.

The Rune is a plant of northern growth, and flourishes best in northern air. Even in the face of Christianity it held its own longer in the north of England, where these stones and crosses are found. It continued in use in Northumbria as late as the tenth century.

The fact of the survival of the Runes in Northumbria at a time when all traces of them had been lost in the southern part of the island, may be due to the more frequent intercourse with Scandinavia from the north than from the south, for this plant of northern growth flourished in Scandinavia long after its entire extinction in England. Therefore in the Exeter Book, of comparatively late date, archaic Runes of the Northumbrian type occur.

Another reason for the survival of the Northumbrian *Futhork* is, that the destruction of Runic inscriptions in the south, was that Augustine in the south waged a fierce war against paganism, destroying every vestige of the older faith. But in a letter from Pope Gregory to St. Mellitus, he recommended that the symbols only of paganism should be abolished, and the holy places consecrated and made use of for Christian purposes. St. Paulinus carried out these instructions in Northumbria, but after his flight the work was taken up by missionaries of the Irish school, who pursued a different policy altogether, adopting the very symbols of paganism, but turning them to account as vehicles of Christian teaching. These missionaries permitted Runic writing, and we are able to discover inscriptions in this character down to the time of St. Oswald, when every trace of Runic lore had been stamped out in the south.

The lecture on the "Book" commenced with a philological investigation into the word "book," which was shown to be a Teutonic word living through all the Scandinavian branch, all the more especially German, and, as well as in our own language, referring, like *liber*, *papyrus*, &c., back to the vegetable kingdom. In our own case *bok* is the beech tree, of which staves used to be cut with four even surfaces, on which Runes were carved. Such an instrument was called a "*Bókstóf*," and such is now the name of a letter of the alphabet all through Scandinavia, Germany, and, in a corrupt form, in Russia, into which country it was introduced, with other elements of Scandinavian civilisation, by Rurik.

When a modification of the Roman alphabet superseded the English Futhork, the people who wrote were ecclesiastics. The earl had little time and less inclination for letters, and *ceorl* (churl) had none, so that priest and monk were the people to whom the charge of book-making was confided. As the "bookstaff" had vanished before the littera, another substance had to be employed for the purpose of writing, and the skins of animals, properly prepared and called *bók fell*, or book skins, appeared. In this name of so different a substance,—taken too from the animal kingdom,—the word for the beech tree (*bók*) lived on; and, when paper superseded skin, the *book* lived on remaining unchanged, whatever its substance might be.

Of the mind of the Englishman the book is the exponent, and we find the earliest volume

designs, and as plenty of youthful architectural assistance can be obtained at small expense, it is more than probable that many architects will find their practice rapidly diverging into other channels.

As the Bill is to be read a second time on the 21st inst., it behoves the profession to prevent the gallant Colonel from carrying out a manifold injustice, not only to architects, but to the owners of house property generally, if his very stringent clauses are to be carried out in their integrity.

A PROVINCIAL ARCHITECT.

Books.

The Practical Applications of Electricity: a Series of Lectures delivered at the Institution of Civil Engineers, Session 1882-83. London: Published by the Institution. 1884.

On the 15th of March, 1883, as some of our readers will remember, while the late Sir William Siemens was delivering a lecture on the electrical transmission and storage of power, in the theatre of the Institution of Civil Engineers, he was interrupted by a loud explosion, followed by the rattle of broken glass from the skylight. It being ascertained that the explosion, whatever it might be, formed no intentional illustration of the lecture, and had not taken place on the premises of the Institution, the lecturer immediately resumed; and it was only after the conclusion of the lecture that it was ascertained that the real cause of the report heard was the explosion of dynamite below the offices of the Local Government Board.

The lecture thus significantly illustrated was one of a series of six, which from February 15 to May 3, 1883, were delivered at the Institution by as many men of eminence, who were all Fellows of the Royal Society, and members of the Institution of Civil Engineers. These six lectures have just been issued in one small volume, for the value of which the names of the lecturers themselves form a sufficient voucher. These are, Mr. Preece, Sir Frederic Bramwell, the late Sir C. W. Siemens, Dr. J. Hopkinson, Sir F. A. Abel, and Sir W. Thomson. The subjects extend over the progress of telegraphy, illustrated by a map showing all the marine cables existing in February, 1883, telephones, transmission and storage of electricity, electric lighting, electricity applied to explosive purposes, and electrical units of measurement.

In the lecture of Sir W. Siemens is contained an account of his electric railway, six miles in length, connecting Portrush with Bush Mills, in the north of Ireland, illustrated by a plan of the line, and a drawing of the carriages. Sir F. Abel has given the best account that we have seen of the most extensive operation in the way of blasting that has hitherto been carried out or attempted; namely, the destruction of the reef of Hallett's Point in East River, New York (famously known as Hell Gate) in September, 1876. The area of the rock in question was three acres; and the object of the operation was to insure a minimum depth of 26 ft. below mean low water level over that surface. The preparation for the final shot was most comprehensive. An aggregate length of 742,567 ft., or upwards of fourteen miles, of galleries and tunnels was driven below the bed of the river; 6,741 holes, most of them 3 in. in diameter, and forming a total length of 58,445 ft., were drilled in the rock; and they were filled with 49,914 lb. of explosives. These consisted of "Giant powder," or No. 1 dynamite, "rand rock," the American rendering of *litho fracteur*; and Vulcan powder, another nitro-glycerine preparation, which is a mixture of nitrate of soda, sulphur, and charcoal with about 30 per cent. of nitro-glycerine. The operation of charging occupied nine days. The charges were connected in continuous groups in series of twenty, and these again were arranged in divided currents in eight groups, every group being connected with a distinct carbon zinc battery of 40 to 44 cells. Thus each battery was intended to explode 160 charges; and the simultaneous explosion of the whole was accomplished by a circuit closer, governing the whole of the series of 23 charges. When the mines were charged, water was admitted to the excavation, which it took 7½ hours to fill to the level of the tide. On the following day, the 24th of September, 1876, the explosion was effected. The maximum height to which the spray was projected was 123 ft., the volume of water raised being apparently trifling, as was the sensible shock experienced. The total amount of rock demolished by the explosion was 63,135 cubic

yards, and it was practically successful over the whole area operated upon.

This illustration of the wonderful degree of control which science has attained over the great disruptive forces liberated by chemistry is very striking. We cite it by way of attracting attention to an educational work which, both in design and execution, is worthy of the important institution which has inaugurated the series of lectures, and of the eminent engineers who, without remuneration, have thus placed the rich stores of their special experience at the services of their younger professional brethren. The lectures give a view of the state of the electric science which is encyclopædic in its range, and luminous in its teaching.

The Practical Dictionary of Mechanics: being a description of Tools, Instruments, Machines, &c.; a History of Inventions, and general Technological Vocabulary and digest of Mechanical Appliances in Science and the Arts. By EDWARD H. KNIGHT. London: Cassell & Co., Limited.

THIS is a supplementary volume to the larger work by the same author. The title will indicate the great range of subjects treated of, and a glance at its pages will reveal its American origin. As the present work consists of rather less than a thousand pages, it will be apparent how manifestly impossible it would be for the author to adequately fulfil the promise of his title. On turning to the pages of the book this is still more apparent, and it is difficult to imagine any specialist, excepting perhaps a leader writer for a daily paper, who could be interested in more than half its contents. The feature that will jar more especially on the susceptibilities of the engineer consulting the pages of this work will be the constant recurrence of descriptions and illustrations of surgical appliances. Thus the third subject mentioned is "abcess knife," which we are told has a curved concave blade, and is contained in an ivory or tortoise-shell handle, not very exhaustive information for the surgeon, and utterly unnecessary for those who require technical instruction on "accumulators," a subject which follows shortly after. The same thing might be said of acrometers, actual, cantory, acupuncture pin, aërotherapy apparatus, asthenometers, and the thousand-and-one surgical devices that are more or less fully described.

The American origin of the work renders it difficult to review it from an English standpoint; but, making every allowance in this respect, we do not think the book will compare favourably with standard dictionaries of reference on mechanical subjects already before the public. For instance, taking at random the subject of launch engines, we have a little over three columns devoted to this matter and occupied principally by illustrations. The first of these is a perspective view of a vertical boiler and single cylinder engine, which could not well be made to work in any steam-launch it would be powerful enough to drive. An editor describing such an arrangement of engine and boiler as typical of machinery fitted for purposes of boat propulsion must be ignorant of the first principles of the subject. The other illustrations under this head are undoubtedly taken from marine practice, but they certainly cannot be said to be representative of launch machinery, at any rate from an English point of view. Turning to the subject of "electric lighting," we have three small-type pages of descriptive matter and numerous illustrations. It naturally follows that the matter cannot be very fully dealt with within such limits of space, and indeed no pretence has apparently been made to bring the descriptions down to very recent date. The gas engine is another branch of mechanical engineering that has created a good deal of interest within the last few years. The principle of the Otto engine is well described, but no mention is made of some other well-known types, notably that of Clarke, which is surely worthy of notice. Over a page of descriptive matter is devoted to torpedoes; but here, again, no great effort has been made to bring the information to the present date. Turning over a couple of pages, we find testing machines more satisfactorily dealt with, there being two fair illustrations of Fairbank's and Emery's apparatus. Over two pages are devoted to a description of the telephone, which is accompanied by a full page of illustrations. Three locomotives are illustrated,

two in full page. They are all of the American type.

The work has not in all cases been by any means carefully edited. For instance, under the letter H we have a description of "hot iron saw." Turning to I, we find another type of hot iron saw under the heading of "iron cutter," and again a third hot iron saw is described under another heading. It would be useless to carry our remarks on this book further. What we have said will serve to convey our estimate of the work, which, it will be seen, is not a high one. The illustrations in which the book abounds are of very unequal merit, some of them being decidedly poor, but the majority serve their purpose fairly well. The full-page engraving, of Florentine carved walnut panels, although it may appear somewhat out of place in a dictionary of mechanics. There is one feature in this work, however, of which we can speak in unqualified praise. To the notice of all the principal subjects treated of there is added a list, in many cases a very full one, of references to standard authorities, so that, if the student does not at all times find very full information in the pages of the work itself, he is directed where to look for it.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

April 25.—6,798, J. B. O'Callaghan, London, Fastenings for Window-sashes and Casements, &c.—6,808, J. Hall, Stockport, Fire-grates, &c.—6,817, H. Westman, Birmingham, Fire-grates, &c.—6,820, T. C. Morgan, Hay, Flushing Water-closets, &c.—6,834, W. Harrison, Sheffield, Door Handles and their Spindles.
April 26.—6,852, B. Shaw, Wakefield, Opening and Closing Doors in connexion with Hoists.—6,861, C. D. Abel, London, Separating and Collecting Soot from the Smokes of Chimneys, &c. Com. by R. Schomburg, Berlin.—6,874, C. F. Sanders, Birmingham, Flushing Water-closets, &c.
April 28.—6,918, F. West and J. P. West, Lewisham, Concrete Construction, &c.—6,919, J. C. Kent, Bedford, Water-closet Disinfecting Apparatus.—6,923, A. Perkins, London, Register Stoves and other Fire-grates.
April 29.—6,993, E. E. Allen, London, Construction of Portable Buildings.
April 30.—7,009, J. T. Armstrong, Newcastle-under-Lyme, Curtaile or Cornice Poles.—7,014, J. Amlin and J. B. O'Neill, Birkenhead, Stair-rods, &c.—7,015, T. W. Halliwell, Brighton, Securing Sheets of Zinc, &c., for Roofing Purposes.—7,028, J. G. Clements, London, Chimney-top.—7,033, S. W. Cragg, Baltimore, U.S.A., Pavements.—7,047, H. C. Smith, Richmond, House Sanitation.—7,055, M. Syer, London, Pneumatic Flushing Apparatus.
May 1.—7,061, J. L. Cartwright, Birmingham, Stench or Drain Traps.—7,068, G. H. Couch, London, Mould for the Manufacture of Bricks, Tiles, Ridges, &c.—7,069, W. Moyes, J. Moyes, and W. Moyes, Pollockshields, Urinals and Water-closets.—7,111, J. Watson and J. L. Spoor, Gateshead-on-Tyne, Kilns for the Manufacture of Portland Cement.

SPECIFICATION ACCEPTED.

April 29.—628, D. Millward-Bowling-green, Manufacture of bricks, &c.—1,800, A. C. Smith, London, Exhaust Chimney-top and Roof Ventilator.—5,568, A. M. Clark, London, Fire-proofing the Joists, &c., of Buildings. Com. by W. H. Dolman, New York, U.S.A.
May 2.—534, A. W. Lake, London, Fireproof Concrete Roofs, Floors, &c. Com. by T. Hyatt, Brooklyn, U.S.A.—5,563, J. B. Petter, Yverl, Stoves and Fireplaces.

NOTICES TO PROCEED

Have been given on the dates first named.

April 29.—5,870, W. Ross, Glasgow, Automatic Drain-flushing Apparatus (Dec. 27, '83)—5,897, R. Lofthouse, Manchester, Ventilation (Dec. 28, '83).
May 2.—5,933, W. E. Heath, London, Shoring-up Dangerous Structures, &c. (Dec. 29, '83)—5,940, J. C. Mewburn, London, Water-closets, &c. Com. by J. E. Boyle and H. Huber, New York, U.S.A. (Dec. 31, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending May 3, 1884.

4,270, D. H. Dade, London, Protecting Wood and other Surfaces against Fire and Transmission of Heat (Sept. 5, 1883, price 2d.).

The wood is first coated with a paint made by mixing ground powdered silicate cotton with a solution of silicate of soda, and then with a coat of ground powdered mica mixed with asbestos, barites, sulphate of lime, and solution of silicate of soda. (Pro. Fr.)

4,413, F. F. Brown, Chester, Parquet Floors (Sept. 15, '83, 2d.).

The wood is formed into tesserae, and these are made
* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

+ Open to public inspection for two months from the dates named.

into tiles so that the grain of the wood is perpendicular to the floor." (*Pro. Pro.*)

4,488, W. M. Simons, Nottingham, Roller-blind Furniture (Sept. 20, '83, 4d.).

A weighted lever is pivoted on the axle of the roller and the hand wheel, after taking round the roller, is led through the lower end of the lever. When the cord is released, the upper weighted end of the lever engages one of a series of pins or stops on the roller, and prevents its revolving. (*Pro. Pro.*)

4,490, S. Van Campen, New York, U.S.A., Decorative Tiles (Sept. 20, '83, 4d.).

These are made of paper, with the pattern embossed on them. The paper is then secured to paste-board, and a coating of size is given. The tile is then immersed in a colour bath, and afterwards varnished.

4,503, W. P. Thompson, Liverpool, Apparatus for Extinguishing Fire. Com. by T. André, Paris. (Sept. 20, '83, 2d.).

A series of pipes is placed round all the walls of the room, &c., to receive water under pressure and they are pierced with holes, which are furnished with taps. (*Pro. Pro.*)

4,527, R. E. Cox, London, Furnaces, Stoves, and Grates (Sept. 21, 1883, 2d.).

To allow anthracite or similar coal to be burned, the air spaces or passages of these grates are reduced by plates of metal, and one of the bars in front is fitted with a gas-burner to start the fire. (*Pro. Pro.*)

MEETINGS.

SATURDAY, MAY 10.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archaeology." (III.) The Palestine Hill. 8 p.m.

MONDAY, MAY 12.

Society of Arts.—Prof. W. Noel Hartley on "Fermentation and Distillation." (I.) 8 p.m.
London and Middlesex Archaeological Society.—8 p.m.

TUESDAY, MAY 13.

Institution of Civil Engineers.—(1) Discussion on Mr. S. B. Boulton's paper on "The Antiseptic Treatment of Timber." (2) Mr. R. W. Peregrine Birch on "The Progress of Upland Water through a Tidal Estuary." 8 p.m.
Birmingham Architectural Association.—Mr. A. Reading on "Comparisons between English and Continental Renaissance Architecture."

Anthropological Institute.—(1) Mr. E. H. Man "On the Ethnology of the Andaman Islands." (2) Professor Flower, F.R.S., "On the Osteology of the Natives of the Andaman Islands." 8 p.m.

WEDNESDAY, MAY 14.

British Museum (Anglo-Saxon Room).—Mr. J. F. Hodgkins on "Early English or Anglo-Saxon Antiquities." (IV.) The Horn. 2 p.m.

Edinburgh Architectural Association.—President's Address.

Society of Arts.—Professor Fleming Jenkin, F.R.S., on "Tolpurgers."

THURSDAY, MAY 15.

Society for the Encouragement of the Fine Arts.—Mr. G. A. Storey, A.R.A., on "Mythology of Colour." 8 p.m.
Society of Antiquaries.—The Rev. H. J. Charles "On a Mural Painting of the Resurrection, from All Saints' Church, Frinton." 8.30 p.m.

Clerks of Works Association (St. James's Hall).—Mr. A. Beckenham on "Electricity: its Application to Public Works and Buildings." 8 p.m.

Royal Institution.—Professor Dewar on "Flame and Oxidation." (IV.) 3 p.m.

Chemical Society.—8 p.m.

FRIDAY, MAY 16.

Architectural Association.—Mr. J. A. Gotch, on "John Thorpe and the English Renaissance." 7.30 p.m.

Royal Institution.—Professor W. Odling, F.R.S., "On the Dissolved Oxygen of Water." 9 p.m.

SATURDAY, MAY 17.

Architectural Association.—Visit to a House in Kensington-court (Mr. T. G. Jackson, architect). 3 p.m.

Edinburgh Architectural Association.—Visit to Dalmeny House, Barabougie, and Dundas Castles.

Miscellaneous.

Third-class Season Tickets.—A deputation waited upon the Board of Directors of the Great Northern Railway, on the 2nd inst., to urge upon them the desirability of issuing season tickets to third-class passengers at a price bearing the same proportion to the first and second class season-tickets as exists between the ordinary daily tickets. At present the working man pays the railway company considerably more than even the first-class season-ticket passenger. The deputation included the Duke of Westminster and the Earl of Shaftesbury, the company named being represented by Lord Lynton, the Hon. Cecil Ashley, and Mr. Farrant, the deputy-chairman. The Chairman of the Great Northern Railway promised that the matter should have the careful consideration of the Board. We hope they will keep their word. Railway companies are slowly finding out that in many respects it is their interest to treat third-class passengers with as much consideration as the other classes, and we do not apprehend that the present case will be found to be an exception. Statistics that have been sent to us show that on a test length of line selected (Hornsey to King's-cross), while the first-class season-ticket holder pays 6d. per working day for transport, over three months, the third-class passenger pays 8d.

Northumberland Avenue.—The whole of the building-sites on both sides of Northumberland Avenue have now been let on lease by the Metropolitan Board of Works, the leasing of the sites for the erection of the Royal Colonial Institute, and residential chambers and offices by the Mayfair Mansions Company, which have just been effected, completing the lettings. In continuation of the National Liberal Club building on the south-west side is the Northumberland Avenue Hotel, which has a frontage of nearly 300 ft. in length, and is to contain eight floors, besides the basement. This structure has been carried to a height of several feet above the ground-line. Messrs. Isaacs & Florence are the architects, and Messrs. Perry, of Bow, the contractors. The Hôtel Métropole, which occupies the whole of the Avenue frontage south of Scotland-yard, with a return frontage into Whitehall-place, is in a forward state, having already been carried five or six stories high. The three buildings thus named, together with the premises of the Society, occupy the whole of the south-west side of the Avenue on the north-east. On the north-east side the buildings in progress south of the Grand Hotel include the new premises for the Constitutional Club, which will have a frontage to the Avenue of upwards of 200 ft. Mr. R. W. Edis, of Fitzroy-square, is the architect, and Messrs. Lucas Bros. the contractors. The Charing-cross Turkish Baths adjoining, which have for some time past been in course of erection, have just been covered in, and will shortly be completed and opened. Mr. R. Walker is the architect, and Mr. Woodward, of Finsbury, is the contractor. Adjoining will be a block of residential chambers, about to be erected for the Mayfair Mansions Company. Mr. O. D. Martin is the architect, and Messrs. Perry, of Bow, the contractors. Immediately to the south will be the Royal Colonial Institute, the foundations of which are now being got in. Messrs. Habershon & Fawcett are the architects, and Messrs. Patman & Fotheringham the contractors. At the south angle of the Avenue and Northumberland-street another block of residential chambers is about to be erected, which, it is stated, will have "novel arrangements," the ground and mezzanine floors being intended to be let for a bank, insurance offices, or other public purposes. Messrs. Bassett, Keeling, and C. D. Martin are the joint architects; and Messrs. Perry & Co., of Bow, are the contractors.

Compressed Air to Let.—At present there is a Bill before Parliament which is to give to a joint-stock company powers to erect very large engines on land within the Borough of Birmingham, and adjacent to the Birmingham and Warwick Canal, and to lay mains in a certain area. The steam engines are to be of great power, and their duty will be to keep the mains charged, by means of suitable pumps, with air at a pressure of 45 lb. per square inch. This compressed air is to be supplied to customers just as gas now is, and its function will be to drive small engines for manufacturing and other purposes. Those who already possess small steam engines and boilers will be able to discard the boilers and all nuisance and expense attendant thereon; while those who have hitherto wished for mechanical power, but been unable to have it, will only need to supply themselves with small engines of a cheap and simple form, in order to be able to avail themselves of the power offered. In many cases local considerations, conditions of lease, or questions of insurance, prevent the employment of a steam engine; not because of the engine itself, but on account of the boiler. In such cases compressed air will often solve the difficulty, as there can be little more objection to a small engine so driven than to sewing-machines.—*The Hardware Trade Journal.*

Surveyorship, West Hartlepool.—Last month, Mr. J. W. Brown, surveyor to the Aston Manor Local Board, was elected to the town surveyorship of West Hartlepool, at a salary of 400l. per annum. The following were selected to be interviewed by the Commissioners, viz.:—Mr. Brown; Mr. Higgs, chief assistant, borough surveyor's office, Bradford; Mr. W. T. Olive, A.-M. Inst. C.E., chief engineering assistant, city surveyor's office, Manchester; Mr. John Price, A.-M. Inst. C.E., engineer and surveyor to the Barton Sanitary Authority; Mr. Alfred Summerscale, A.-M. Inst. C.E., chief assistant, borough engineer's office, Leeds; and Mr. Walstenholme, chief assistant, borough engineer's office, Blackburn.

Earthquakes and Luminous Paint.—The connexion between earthquakes and luminous paint would hardly be apparent to any one without explanation. It nevertheless exists, and the recent earthquake in our own country has served to remind us of its existence. As a matter of fact, the Pioneer Paint Company, who are working Balmains' luminous paint patents, send in large consignments of this paint to those countries where earthquakes are prevalent. The use to which it is put invests it with the utmost importance just for the few critical moments of the shock. In the Philippine Islands, where earthquakes are not uncommon, small metallic plates coated with luminous paint are so placed about the premises that at the first warning the inmates are quickly guided to the door, and thus to the street. In Manila it is laid on in patches about the bedrooms and staircases, serving as guides for the door-handles and the stairs, night lights being considered especially dangerous as likely to set fire to the falling house, and thus to roast the inmates in their own homes. It follows that those who live in districts likely to be visited by earthquakes will do well to adopt this plan, and to burn no flame lights at night, especially in the case of gas, the pipes for which might be broken asunder, and the gas escape and take fire. The gas should be turned off at the main nightly, and luminous labels be so placed as to indicate the door-handles and other guides to the main point of egress, which would enable the residents to find their way out of their houses in the dark before the walls perchance buried them.—*Iron.*

Discovery of the Necropolis of San Zoan.—We extract the following from the *Times*:—"At a spot never visited by Mariette and unexplored save by pillaging natives, Mr. W. Flinders Petrie has just identified the site of the long-sought Necropolis of San. Results of great historic interest may be hoped from this important discovery. Mr. Petrie also reports the recent excavation of a small chapel or shrine, of Ptolemaic date, containing six stela, two human-headed sphinxes, one royal statuette, and various minor objects. The plan of the chapel is cruciform, the upper end being occupied by an inscribed tablet representing Ptolemy Philadelphus and his sister-goddess, Arsinoë, in adoration before Khem, Neith, and Buto. The upper part of this tablet was originally covered with a coat of gilding. The sphinxes were found in situ, flanking each side of the tablet. The other stela lined the walls of the two side recesses, and comprise (1) a second tablet of Ptolemy and Arsinoë, of fine Græco-Egyptian work, representing this king and queen standing face to face, sceptred and crowned; (2) a table of a king worshipping Khem, Horus, Isis, and Buto; (3) a funeral tablet of a private individual (probably the founder of the chapel), with an inscription in the domestic character; (4 and 5) two votive tablets in honour of the bull Apis. These objects are all perfect; but the royal statuette, which is 22 in. in height, has been broken in twain and reunited in ancient times. The chapel had apparently been walled up with its contents while Ptolemy Philadelphus was king, and so remained intact until revealed the other day by the pick of the excavator."

Sunday Opening.—The Sunday Society write, through their secretary, Mr. Mark H. Judge, that the Society of British Artists intend to throw open their galleries to the public next Sunday, from 6.30 to 9 p.m., as an experiment in regard to Sunday opening. Admission will be by ticket, to be obtained from the secretary, 8, Park-place Villas, W. While sympathising with the movement, we wish the Sunday sight-seers were going to be admitted in a gallery with better pictures in it than most of those to be seen at Suffolk-street.

Society of Arts.—The last course of Cantor Lectures for the present session will be on "Fermentation and Distillation," by Prof. Noel Hartley, F.C.S. The course will consist of three lectures, and will be given on Monday evenings, the 12th, 19th, and 26th instants.

Royal Institute of Painters in Water-colours.—Mr. Frank Dadd, Mr. H. R. Steer, and Mr. C. Napier Hemy, were, on Monday last, elected members of this Institute. Mr. Hemy is an important addition to their ranks.

Melksham.—The Local Board for the district of Melksham have appointed Mr. David Mackenzie, C.E., Melksham, Wilts, as the engineer for the new sewer drains proposed to be laid down in the principal parts of the town.

Society of Engineers.—At a meeting of the Society of Engineers, held on Monday evening last, at the Westminster Town-hall, Mr. A. Rigg, president, in the chair, a paper on "The Engineering of Malting," by Mr. H. Stopes, was read. The author sketched a brief outline of the early history of malting, and gave the statistics relating to the quantities of malt made, its present uses, and the capital and labour employed in the trade. The paper was divided into the following sections:—I. The usual or common English system of malting; II. The old-fashioned Continental system of Malting; III. The modern or pneumatic system of malting (Galland's and Saladin's); IV. The manufacture of black, amber, brown, crystal, and other special malts; V. The gelatinisation of rice or maize and other processes of preparing grain for brewers' use. Full descriptions were given of all the necessary buildings, apparatus, and tools employed in each of the above methods. A diversity of rules for the aid or guidance of engineers under each section were formulated, and a number of machines and appliances of a novel character were described, some for the first time.

Schools, Erdington, for the Aston School Board.—Six sets of designs were submitted in limited competition for the above, and on the award of Mr. E. R. Robson, F.S.A., Architect to the London School Board, the designs of Mr. William Henman, A.R.I.B.A., of Bennetts Hill, Birmingham, were selected, subject to a suitable tender being obtained within the stipulated expenditure of £3,500, which had to include the school buildings for 400 children in two departments, a caretaker's residence, covered playgrounds, the asphalted of the whole of the playgrounds, boundary wall, &c. On the invitation of the Board, fourteen builders submitted tenders; that of Mr. W. Bennett, of Loxells, amounting to £3,277, being the lowest, has been accepted, and the work is to be proceeded with so soon as the sanction of the Educational Department has been obtained.

TENDERS.

For the erection of new shops and assembly room at Ipswich, for the Ipswich Industrial Co-operative Society, Limited. Mr. James F. Goodey, architect. Quantities by the architect:—

E. Catchpole, Ipswich.....	£9,500 0 0
A. Cox, Ipswich.....	9,000 0 0
Grinwood & Son, Sudbury.....	8,400 0 0
Kenny, Ipswich.....	8,190 0 0
H. Gier, Ipswich.....	8,088 0 0
Everett & Son, Colchester.....	7,819 0 0
O. Gibbons, Ipswich.....	7,600 0 0
G. Dobson, Colchester.....	7,580 0 0
C. Wyatt, Ipswich.....	7,328 0 0
G. Chambers, Colchester.....	7,100 0 0
K. Smith, Ipswich.....	7,097 0 0
F. Dupont, Colchester (accepted).....	6,935 0 0

For additions to residence for Mr. E. Thomas, at Woburn, Bucks. Mr. Arthur Vernon, architect, High Wycombe:—

Gibson.....	£1,685 5 0
Silver.....	1,621 0 0
Woodbridge.....	1,597 0 0
Loosley.....	1,520 0 0
Hunt (accepted).....	1,488 0 0
Martin.....	1,380 0 0

For new conservatory and verandah to residence at Woburn, Bucks. Mr. E. Thomas, Mr. Arthur Vernon, architect:—

Gibson.....	£365 5 0
Silver.....	485 0 0
Woodbridge.....	469 0 0
Martin.....	405 0 0
Hunt.....	394 0 0
Loosley.....	387 0 0

For new stables to residence for Mr. E. Thomas, at Woburn, Bucks. Mr. Arthur Vernon, architect:—

Woodbridge.....	£800 0 0
Silver.....	722 0 0
Gibson.....	787 12 0
Loosley.....	777 12 0
Martin.....	770 0 0
Hunt (accepted).....	767 0 0

For new national school-room at Wycombe Marsh, Bucks. Mr. Arthur Vernon, architect:—

Harris.....	£300 0 0
Martin.....	375 0 0
Hunt.....	359 0 0
Loosley.....	357 12 0

For fitting up two fronts in shops adjoining to Falcon Tavern, Clapham Junction, for Mr. J. Taverner, Mr. H. J. Newton, architect:—

Goldie.....	£155 0 0
Lambie.....	145 0 0
Pickergill (accepted).....	139 0 0

For rebuilding farm buildings at Drayton, for Mr. T. N. Dene, Mr. J. S. Dodd, architect, Reading:—

J. Dover, Oxford.....	£280 0 0
W. Stevens, Abingdon.....	338 0 0
C. Hunt, Abingdon.....	319 0 0
Backler Wheeler, Abingdon.....	345 0 0
E. Williams, Abingdon (accepted).....	300 0 0

Erection of schools at Rutland-street, Tower Hamlets, for the London School Board. Mr. E. R. Robson, architect:—

M. Gentry.....	£12,375 0 0
J. Grover.....	12,300 0 0
T. Boyce.....	12,220 0 0
Alberton & Latta.....	12,131 0 0
W. Oldrey.....	12,120 0 0
C. Cox.....	11,995 0 0
W. Bangs & Co.....	11,840 0 0
G. S. Pritchard.....	11,810 0 0
W. Shurmer.....	11,772 0 0
Kirk & Randall.....	11,691 0 0
Patman & Fotheringham.....	11,665 0 0
Perry & Co.....	11,653 0 0
J. R. Hunt.....	11,629 0 0
Simpson & Co.....	11,603 0 0
C. Wall.....	11,538 0 0
W. Scrivener & Co.....	11,527 0 0
H. L. Holway.....	11,462 0 0
R. J. Jerrard.....	11,439 0 0
S. J. Bross.....	11,386 0 0
E. T. J. Wood.....	10,863 0 0

For the enlargement of Vittoria-place Schools, Penton-ville, for the London School Board. Mr. E. R. Robson, architect:—

W. Goodman.....	£8,982 0 0
J. R. Hunt.....	8,837 0 0
G. S. Williams & Son.....	8,766 0 0
Steel Bros.....	8,721 0 0
F. & F. J. Wood.....	8,399 0 0
W. Brass.....	8,592 0 0
W. Shurmer.....	8,568 0 0
Simpson & Co.....	8,399 0 0
C. Wall.....	8,444 0 0
H. Hart.....	8,421 0 0
T. Boyce.....	8,379 0 0
S. J. Jerrard.....	8,369 0 0
J. Grover.....	8,326 0 0
W. Scrivener & Co.....	8,262 0 0
Wall Bros.....	8,168 0 0

For proposed new water-closets and covered playground at Tazon-street Schools, Bermondsey, for the London School Board. Mr. E. R. Robson, architect:—

J. D. Robson.....	£58 0 0
G. S. Pritchard.....	457 0 0
W. Shurmer.....	468 0 0

For proposed water-closets and covered playground at Cottenham-road Schools, Holloway, for the London School Board. Mr. E. R. Robson, architect:—

G. S. Williams & Son.....	£339 0 0
W. Shurmer.....	270 0 0

For new factory in Warwick-lane, E.C., for Messrs. Hitecock, Williams, & Co. Messrs. Searle & Hayes, architects:—

Patman & Fotheringham.....	£5,890 0 0
Holliday & Greenwood.....	5,590 0 0
J. E. Atford.....	5,380 0 0
Mark Patrick & Son.....	5,261 0 0
J. O. Richardson.....	5,100 0 0

For Erdington School, for the Aston School Board. Mr. William Henman, 38, Bennetts-hill, Birmingham, architect. Quantities supplied by Mr. Chas. Henman, architect, 64, Cannon-street, London:—

W. & L. Webb.....	£2,890 0 0
Wilson & Son.....	2,707 0 0
J. Moffatt.....	2,738 0 0
W. Robinson.....	2,680 0 0
T. W. Smith.....	2,583 0 0
Sapcote & Son.....	2,637 0 0
Surman & Son.....	2,601 0 0
J. Bowen.....	2,505 0 0
T. Holcomb.....	2,580 0 0
Barker & Son.....	2,687 0 0
Barnesley & Son.....	2,548 0 0
Horsley Bros.....	2,439 0 0
W. Lee.....	2,534 0 0
W. Bennett.....	2,377 0 0

For building a day or mess room at the Lambeth Infirmary, Brook-street, Lambeth. Messrs. Fowler & Hul, architects, Sergeant's-Inn, Fleet-street. Quantities by Messrs. Fowler & Huggman, Spring-gardens:—

McGee.....	£1,085 0 0
Riches.....	1,027 0 0
Horner.....	1,010 0 0
Belpin & Cook.....	953 0 0
Lucas & Son.....	949 0 0
Howell & son.....	930 0 0
Higgin & Brown.....	898 0 0
Ford & Son.....	894 0 0
Gound.....	877 0 0
Tyerman.....	860 0 0
Crocker.....	860 0 0
Ansell.....	817 0 0
J. D. E. & J. Brown.....	805 0 0
Hammond.....	798 0 0
Pack Bros.....	785 0 0
Dickenson.....	749 0 0

For alterations to the Variety Theatre, Hoxton. Mr. J. G. Buckle, architect:—

W. Shurmer.....	£396 0 0
Steel Bros.....	378 16 0

For erection of Congregational Church, Barkway, Herts. Mr. D. Church, architect:—

Roberts.....	£1,197 0 0
Parker.....	1,061 0 0
W. Shurmer.....	963 0 0
Saville.....	873 0 0
Willmott & Son.....	835 0 0
Tinson.....	831 0 0

For the erection of factory at Greenwich, for Messrs. Lovell & Son. Mr. J. H. Johnston, architect:—

W. Shurmer.....	£1,280 0 0
Atterton & Latta.....	1,265 0 0
S. J. Jerrard.....	1,243 0 0
Brille.....	1,192 0 0
H. S. Holloway.....	1,127 0 0

For completing floor mills at Barking, for Mr. J. Dewe, Mr. J. S. Dodd, architect, Reading:—

A. W. Dodd.....	£1,500 0 0
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For finishing houses at Upton Park for the Land Investment Company, Limited. Messrs. Whitmore & Reeves, architects and surveyors, 11, Devonshire-square, Bishops-gate:—

R. M. Heath, New Wandsworth.....	£3,822 13 11
C. W. East, Plaistow.....	2,962 0 0
T. Donaldson, Leytonstone-road.....	2,463 0 0
G. Moir, Upton.....	2,024 0 0
G. Cordery, Plaistow.....	2,171 17 0
Blomfield & Adams, West Ham.....	2,152 0 0
S. L. Stone, Forest Gate.....	2,000 0 0
T. Phelps, Custom House.....	1,900 0 0
W. Pollard, Forest Gate.....	1,860 0 0
A. Nichols, Leytonstone.....	1,806 10 0
England & Thompson, Leytonstone.....	1,773 0 0
C. H. Richardson, Stratford, £1,700 or.....	1,675 0 0
T. Brickell, Manor Park.....	1,562 0 0
* Part tender. † Reduced and accepted.	

For completing five houses at Upton Park, for the Land Investment Company, Limited. Messrs. Whitmore & Reeves, architects and surveyors, 11, Devonshire-square:—

W. Feary, Forest Gate.....	£850 0 0
H. Brackley Upton-lane.....	850 0 0
W. Meall & Sons, Cable-street.....	837 10 0
S. L. Stone, Forest Gate.....	500 0 0
W. Lake, Stratford.....	450 0 0
G. Moir, Upton.....	440 0 0
T. Brightmore, North Woolwich.....	420 0 0
C. H. Richardson, Stratford.....	405 0 0
T. Russell, Forest Gate.....	400 0 0
S. W. Hart, Plaistow.....	400 0 0
J. W. Martin, Upton.....	390 0 0
G. Cordery, Plaistow.....	380 0 0
T. Phelps, Custom House.....	285 0 0
E. Nicholson, Forest Gate (withdrawn).....	157 10 0
* Accepted.	

For alterations and conservatory to residence, Dulwich, for Mr. James Henderson, Mr. R. Peters, architect, Wool Exchange, Coleman-street:—

Watson (accepted).....	£175 0 0
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For pair of villa residences at Sydenham, for Mr. W. S. Hart, Mr. Richard Peters, architect:—

Richardson Bros.....	£600 0 0
T. Esner, Julian, & Co.....	640 0 0
Watson (accepted).....	605 0 0

For decoration and alterations to Nos. 12 and 14, Digby-road, Homerton, for Mr. W. Pittam, Mr. Richard Peters, architect:—

Richardson Bros.....	£185 0 0
Watson (accepted).....	145 0 0
Moody Bros.....	90 0 0

For road and sewer (Contract No. 4), Mayow Park Estate, Sydenham. Mr. W. Whiddington, architect, 28, Finsbury Pavement:—

Marshall, Brighton.....	£330 0 0
[No competition.]	

For erecting eight detached houses at Bromley, Kent, for Mr. Samuel Cawston, Mr. A. Cawston, architect, 5, Spring-gardens:—

G. H. Lay, Bromley (accepted).....	£3,800 0 0
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For roads, drains, &c., at Beach Hill Park, Hadley Wood, Middlesex (see also section), for Mr. Charles Jack. Mr. Edwin T. Hall, surveyor, 57, Moorgate-street:—

W. Lloyd, Kilburn (accepted).....	£3,541 0 0
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For repairs to Elm Grove-road, Cricklewood, for the freeholder. Mr. Edwin T. Hall, Moorgate-street, surveyor:—

W. Lloyd, Kilburn (accepted).....	£140 0 0
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For roads and sewers, near Custom House Station, Victoria Docks, London, for Mr. R. J. Burman, Messrs. Hussey, Walcott, & Blackford, 1, Gray's-Inn-place, surveyors:—

T. Adams, Anshurst-road, Hackney (accepted).....	£2,989 0 0
[No competition.]	

For pulling down and rebuilding premises, 81, Westbourne-grove, Bayswater, for Mr. G. M. Carlisle. Mr. J. Christian Hukus, architect:—

Magee & Co. (accepted).....	£1,300 0 0
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For the pulling down and rebuilding of the Old King's Head, Fulham:—

Arts.....	£2,320 0 0
Rudkins.....	2,049 0 0
Chamberlain.....	1,993 0 0
Adamson.....	1,945 0 0
Smith.....	1,915 0 0
Pickergill (accepted).....	1,921 0 0
Beale.....	1,878 0 0

For sundry alterations and sanitary works at the Bermondsey Workhouse, for the Guardians of the St. Olave's Union. Mr. George Elkington, architect:—

Bargman.....	£446 0 0
Bullers.....	427 10 0
Brockwell.....	425 0 0
Preston.....	407 0 0
Smith & Barnes (accepted).....	395 0 0

For new 120 quarter malling at Faversham, for Messrs. W. E. & J. Riden. Mr. R. White, Duffield, Derby, architect:—

Section 2.—Above Ground Line.	
Glasscock & Son, Stafford.....	£8,650 0 0
Parman & Son, Margate.....	8,600 0 0
Perry & Co., London.....	6,955 0 0
H. Stiff, Dover.....	5,900 0 0
J. J. Wise, Deal.....	5,776 0 0
Wallis & Clements, Maidstone.....	5,770 0 0
L. Shrubsole, Faversham.....	5,659 0 0
G. H. Denne & Son, Deal.....	5,679 0 0
Dickinson, London.....	5,138 0 0
J. Greenwood, Mansfield (accepted).....	4,900 0 0
Todhill & Bellamy, Sutton Bridge.....	4,900 0 0
Two late.	

For alterations, &c., at Mill-street, Conduit-street. Mr. J. Hamilton, architect:—

Harper.....	£325 0 0
Larter & Son.....	285 0 0
Scott.....	299 0 0
W. Shurmer.....	270 0 0
Hayworth.....	265 0 0

For the enlargement of schools at Medbury-st., Chelsea, for the London School Board. Mr. E. R. Robson, architect.—

W. Goodman	£9,922 0 0
W. Oldrey	8,781 0 0
J. R. Hunt	6,030 0 0
J. Grover	8,843 0 0
H. L. Holloway	6,402 0 0
Patman & Fotheringham	8,344 0 0
S. J. Jerrard	8,219 0 0
F. & F. J. Wood	8,232 0 0
Stimpson & Co.	6,180 0 0
Perry & Co.	6,178 0 0
W. Shumner	6,170 0 0
W. Bangs	6,165 0 0
T. Boyce	6,091 0 0
G. S. Pitchard	6,088 0 0
G. S. Williams & Son	6,059 0 0
W. Scrivener & Co.	5,999 0 0
Wall Bros.	5,932 0 0

For the erection of schools at Westville-road, for the London School Board. Mr. E. R. Robson, architect.—

Perry & Co.	£16,998 0 0
W. Brass	16,540 0 0
W. Downs	16,533 0 0
T. Boyce	16,540 0 0
H. L. Holloway	16,416 0 0
Lather Bros.	16,333 0 0
Wall Bros.	16,300 0 0
C. W. Realing	16,154 10 0
Patman & Fotheringham	16,099 10 0
W. Tongue	16,067 0 0
J. R. Hunt	16,057 0 0
W. Scrivener	16,035 0 0
W. Oldrey	16,000 0 0
J. Grover	16,000 0 0
H. Hart	15,991 0 0
W. Bangs & Co.	15,975 0 0
W. Shumner	15,960 0 0
Stimpson & Co.	15,710 0 0
C. Wall	15,691 0 0
S. J. Jerrard	15,673 0 0

For the erection of Nos. 14 and 15, Hockley-line, City. Mr. Alfred R. Pitts, architect, 44, Bloomsbury-square. Quantities by Mr. Rookwood:—

Linn	£2,021 0 0
Hayward & Son	1,943 0 0
Crowland & Co.	1,923 0 0
Grover	1,913 0 0
Williams & Son	1,783 0 0
Patman & Fotheringham	1,774 0 0
Toms	1,767 0 0
Woodward	1,750 0 0
Falkner	1,735 0 0
Smith & Sons	1,697 0 0
Hooper	1,678 0 0

For the intended and estimated painting work, &c., at the Banstead School, Banstead, Surrey, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Harrison, architects, 16, Leadenhall-street.—

Liley & Wood	£2,247 0 0
Johnson & Co.	1,520 0 0
Gordon, Kell & Smith	1,512 10 0
Harvey	1,462 0 0
Laphorne & Co.	1,368 0 0
Longley	1,285 0 0
Deacon & Co.	1,226 0 0
Taylor	1,213 0 0
Kent Bros.	1,193 0 0
Barratt & Sons	1,155 0 0
Stevenson	1,070 0 0
Reed	1,050 0 0
Potter, Sutton, Surrey (accepted)	1,050 0 0

For the erection of a house at Herne Bay for John Bossey, Esq. Mr. Robert Willey, 68, Ludgate-hill, architect.—

Farley, Herne Bay	£1,066 0 0
Brown, Herne Bay	1,019 0 0
Adams, Herne Bay (accepted)	999 0 0

For the construction of a new road south of the Castlebar-road, on the Hanger Hill Estate at Ealing. Mr. Robert Willey, architect.—

Killingbeck, Camden Town	£172 0 0
Nowell & Robson, Kensington	379 0 0
Adams & Sons, Ealing	379 0 0
James Pizz, Haverley	368 0 0
Ford & Everett, Kensington	352 0 0

For repairs to Nos. 15, 16, and 17, Paternoster-row, City, and warehouses at rear. Mr. Robert Willey, architect.—

Hayward & Son, City	£737 0 0
Woodward, Finsbury	681 0 0

For alterations, repairs, and other works to be done at the Palace, Holborn Public House, 55, High-street, Camden Town, for Mr. Arthur Brya. Mr. A. G. O'Byrne, architect, Wimpole-st. Quantities supplied:—

Perkins	£1,177 0 0
Asford	975 0 0
Ansell	912 0 0
Moser (accepted)	831 10 0

For laying out, drawing, &c., the extension of the Lamington Cemetery for the Lamington Prior's Burial Board.—

Holme & King, Liverpool and Kenilworth	£3,937 0 0
T. Bailey, Leamington	3,740 0 0
G. F. Smith, Milverton, Leamington	3,700 0 0
T. Mills, Leamington	3,543 0 0
George Law, Kidderminster	3,300 0 0
Curral & Lewis, Birmingham	3,110 0 0
T. Houghton, Leamington	2,900 0 0
Richard Bowen, Leamington	2,994 0 0

For pulling down and rebuilding the Old King's Head, Fulham, for Messrs. Bell & Co., Brewers. Mr. A. C. Bean, architect. Quantities supplied:—

Avis	£1,320 0 0
Rudkins	2,040 0 0
Chamberlain	1,988 0 0
Adams	1,945 0 0
Smith	1,916 0 0
Pickergill	1,910 0 0
Beale	1,876 0 0

For new kennels, cottage, and other buildings, and alterations to dwelling houses and stables at Kingston Bagshuze, Berks, for the Old Berks Hunt. Mr. F. H. Barnfield, F.S.I., Faringdon, Berks, architect and surveyor:—

Barns & Son, Witney	£2,609 15 11
Joe Sheppard, Faringdon	2,494 0 0
Cadd & Son, Faringdon	2,246 0 0
Buckle & Wheeler, Abingdon	2,178 0 0
W. & J. Wheeler, Faringdon	2,411 0 0
Joe Wheeler, Wantage	1,916 7 6

Now Mission Hill, Haverley, Messrs. John Allen & Sons, builders, of 24, Kilburn Park-road, write to say that their tenders for the work, who have appeared with on p. 629 of last week's *B. T.*, should have been marked "withdrawn through clerical error." The amount of their tender should have been 3,860.

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

E. T. (drawing received).—I, Q. & E. T. W. (we are not the least in want of your services as correspondents). W. C. (1) in your issue week. (2) in your issue week. (3) in your issue week. (4) in your issue week. (5) in your issue week. (6) in your issue week. (7) in your issue week. (8) in your issue week. (9) in your issue week. (10) in your issue week. (11) in your issue week. (12) in your issue week. (13) in your issue week. (14) in your issue week. (15) in your issue week. (16) in your issue week. (17) in your issue week. (18) in your issue week. (19) in your issue week. (20) in your issue week. (21) in your issue week. (22) in your issue week. (23) in your issue week. (24) in your issue week. (25) in your issue week. (26) in your issue week. (27) in your issue week. (28) in your issue week. (29) in your issue week. (30) in your issue week. (31) in your issue week. (32) in your issue week. (33) in your issue week. (34) in your issue week. (35) in your issue week. 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Supplement to The Builder,

MAY 10, 1884.

GENERAL CONFERENCE OF ARCHITECTS.

THE SEVENTH* General Conference of Architects, held under the auspices of the Royal Institute of British Architects, was formally opened on Monday afternoon last, when Mr. Horace Jones, the retiring President of the Institute, received a not very large number of town and country Fellows and Associates, in the West Gallery of the premises in Conduit-street. Among the visitors who were welcomed by the President and Council was M. Chas. Lucas, Honorary and Corresponding Member of the Institute, and secretary of the Société Centrale des Architectes de Paris, to whose voice the members attending the Conference have had the pleasure of listening at two of the meetings. On the walls of the gallery in which the reception took place were exhibited a very interesting collection of working drawings and sketches by three recently-deceased masters,—Street, Burgess, and Viollet-le-Duc. These drawings served to heighten the interest with which the three papers set down on the programme for Wednesday evening's meeting were looked forward to. The late Mr. Street's drawings were lent by Mr. Arthur E. Street; those of William Burgess were lent by Mr. R. Popplewell Pullan and Mr. George Aitchison, A.R.A.; and those of M. Viollet-le-Duc were the *fac-simile* drawings published by MM. Morel, of Paris. A collection of bound drawings, sketches, and scraps, was also exhibited, this collection being lent by Messrs. Aitchison, Sydney Vacher, R. P. Pullan, and other members of the Royal Institute of British Architects.

On Tuesday a large number of the gentlemen taking part in the Conference visited the Guildhall Library and Council-chamber, the Eastern Extension of the Stock Exchange Building, and the works, now in progress, of the Metropolitan (Inner Circle) Railway. Separate reports of these visits will be found on other pages.

The business proper of the Conference commenced on Tuesday evening, when a meeting was held in the Institute room.

Mr. C. Barry, F.S.A., who occupied the chair, offered a few words of welcome in the name of the Institute. He added that the proceedings of the early part of the day had not been unprofitable or uninteresting. Visits had been paid to works of no inconsiderable importance, and he had been pleased to witness a large attendance at the New Stock Exchange buildings under the charge of Mr. Cole. Those who had visited the Inner Circle Railway had also found matter of interest. The paper which he would now call upon Mr. Cates to read touched some of the most important subjects that could be discussed by them.

Mr. Arthur Cates then read the following paper on,—

THE DUTIES, OBLIGATIONS, AND MUTUAL RELATIONS OF ARCHITECT AND CONTRACTOR, WITH REFERENCE TO ENGLISH AND FOREIGN PRACTICE.

When drawing up the programme of the proceedings of this Conference, the Committee considered that "the duties, obligations, and mutual relations of architect, client, and contractor with reference to both English and foreign practice," would form an excellent subject for discussion at one of the meetings. They accordingly prepared a series of questions which were addressed to correspondents of the Institute, with the result that replies have been received from Professor Fenger, of Copenhagen, Th. Ritter Von Hansen of Vienna, and Herr Ende of Berlin.

* The first Conference was held in 1871, the second in 1872, the third in 1874, the fourth in 1876, the fifth in 1878, and the sixth in 1881. Copious notes of the proceedings will be found in the volumes of the *Builder* for the years named.

Communications respecting the practice in America have also been received from Mr. Sydney Smirke, who practised for many years in America, and who will, I hope, be present here this evening, and favour the meeting with his observations on those points in which American practice differs from ours.

At the request of the Committee I have read these communications, and summarised them in such a manner as will, I hope, satisfactorily open the discussion.

For France I am indebted for much information to Mr. W. H. White and Mr. R. Phené Spiers, and have referred to some of the leading text-books on French Building Legislation, more particularly to,—

"Manuel des Lois du Bâtiment," published by the Société Centrale des Architectes.

Frémey Ligneville, "Traité de la Législation des Bâtimens," 2 vols. 8vo., 1881.

O. Masselin, "Nouvelle Jurisprudence et Traité pratique sur les Honoraires des Architectes," 8vo., Paris, 1879.

O. Masselin, "Nouvelle Jurisprudence et Traité sur la Responsabilité des Architectes," etc., 8vo., 1879.

I must admit that when the questions settled by the Committee were first placed in my hands, I was somewhat startled by the wide range they covered, which seemed to me likely to require a whole conference or even a series of conferences for their complete discussion. As, however, the time at our disposal this evening is but limited, and the object of the meeting is to afford those who attend an opportunity of expressing their views and discussing points of general practice, I will, as shortly as possible, bring before you the replies which have been received.

Happily, the first question, which relates to the tenure of land for building purposes, has been thought to be of sufficient importance to have an entire meeting appropriated to its consideration, and to-morrow (Wednesday) morning Mr. Blasbitt will read a paper thereon.

The next series of questions relates to the architect, and it will be convenient to consider each separately. Thus,—

When an architect is employed upon the erection of a house, is it usual for him to perform the following services?—(a) Preparing all the drawings that are required and a specification of the works; (b) Arranging terms with the contractor or contractors; (c) Superintending the work; (d) Deciding on the amount of money that is to be paid to the contractor or contractors according to the terms and dates of payment.

To this, the reply from Copenhagen is the simple affirmative,—Yes; but in Austria the architect's duties appear to be somewhat more extended, as beyond those set out in the question he prepares an accurate estimate of quantities of the building to be executed, from which the contractors can ascertain the quantities of the several descriptions of work.

A similar practice appears to exist in Germany, and in France the preparation of the *Devis estimatif* is one of the duties of the architect, and is included in the services covered by his commission; but on this head more particulars will be given when the tariff of charges under which German architects work and the remuneration of French architects is considered.

To the third question,—Does the architect usually perform any other services?—the reply is in each case, No.

4. Is his decision as to the quality of the work and material and as to payments final and binding?—is answered, in accordance with ordinary English practice, with the proviso as regards Austria that if the contractor desires in such cases to appeal to a legal tribunal, the right of doing so must be expressly stipulated in the contract; while in Germany it is often stipulated in the contract that in cases of dispute one or

more arbitrators shall decide the question at issue.

5. Is the architect responsible to the client for any losses that may arise through bad work or materials which he ought to have checked; and, if so, for a limited or unlimited time?

It appears that in Denmark this responsibility has not hitherto been exactly defined by law or by custom, but if losses have been suffered through the architect's neglect or liability the employer may sue him for damages within the first twenty years.

The reply from Vienna is vague, and to the effect that the contractor is held responsible for, and to make good, loss through bad work or bad material.

The Architectural Association of Germany has the responsibility of the architect to the client at present under consideration, but no decision has been arrived at. There the tradesman is responsible to the architect as well as to the client for the goodness of the work. In doubtful cases the architect leaves the selection of the tradesman to the client, thus giving the latter an influence by which he cleverly diminishes his own responsibility. No instance is known to Herr Ende in which an architect has had to bear the responsibility for the shortcomings of a tradesman. Every architect is legally answerable for his designs so long as these are followed. Where a tradesman deviates from the instructions of the architect the latter assumes the responsibility if he sanctions deviations in a general way. If the architect is demonstrably lax in his supervision, of course the law holds him responsible.

In France and those countries subject to the Code Napoléon the responsibility of architects and contractors is defined by six articles of the Code Civil, four of which are of general application, while Art. 1,792,—"*Si l'édifice construit à prix fait, péricule tout ou en partie par le vice de la construction, même par le vice du sol, les architectes et entrepreneurs ou sont responsables pendant dix ans*,"—appears to make the architect and contractor liable for ten years; and Art. 2,270,—"*Après dix ans, l'architecte et les entrepreneurs sont déchargés de la garantie des gros ouvrages qu'ils ont faits ou dirigés*,"—relieves the architect and contractor from liability after ten years.

There has been considerable controversy as to the exact meaning of Art. 1,792, it being contended that it is only applicable where the architect is the contractor; but, nevertheless, the responsibility attaches to the architect under the general principles of Art. 1,382:—"Tout fait quelconque de l'homme, qui cause à autrui un dommage, oblige celui par la faute duquel il est arrivé à réparer"; Art. 1,383:—"Chacun est responsable du dommage qu'il a causé, non seulement par son fait, mais encore par sa négligence ou par son imprudence"; and Art. 1,992:—"Le mandataire répond non seulement du dol, mais encore des fautes qu'il commet dans sa gestion," which make him, in common with all other citizens, liable for the results of faults he may commit, and those he may by negligence or otherwise permit others to commit over whom he may have authority. For errors of design and want of skill resulting in failure of the building wholly or in part, neglect of legislative enactments and municipal and police regulations, neglect of servitudes and easements to which the site is subject and which the architect could have ascertained, providing a building which does not satisfy the defined requirements, the client has his remedy against the architect alone. For improper execution of work, defective or improper material or workmanship, the client's remedy is against both contractor and architect; against the one for having committed the wrong, and against the other for having by inefficient superintendence permitted it; but the architect himself has his remedy against the contractor. These responsi-

bilities have many qualifications arising from the varying relations of the parties, but it would not be possible to enter into such details on this occasion.

The limit of ten years does not apply to cases of fraud; in these the term of prescription is extended to thirty years.

In England the Statute of Limitations being seven years, it would appear that the architect is in ordinary circumstances protected after the lapse of that period.

6. On what basis is the architect's remuneration calculated, and is this settled by any law or custom?

The Danish architects have not yet agreed upon a schedule of remuneration, but often use the German and Swedish schedules, which will be found in the report of the Congrès International des Architectes, Paris, 1878.

In Austria the terms of professional remuneration are not fixed by law, but the Architectural Association has drawn up a certain scale of charges. It is, however, optional with the architect and client whether they accept this or not. As a rule professional remuneration is calculated at from three to five per cent., according to the nature of the work.

In Germany a very elaborate tariff is adopted which was drawn up by the Architectural Section at the Fifteenth Congress of German Architects and Engineers, held at Hamburg in 1868. The ordinary work of the architect is there divided in five classes, commencing with ordinary agricultural buildings and the plainest description of town and country dwellings, and ending with exterior and interior decorations and ornamental work. The scale of remuneration is set out under six subdivisions of the architect's work and nine progressive stages of cost, the first limit being 300l. and the highest 30,000l. and upwards.

The services to be performed by the architect are defined as—

(a.) *Sketches*.—Preparing sketches (plans and elevations) drawn to scale, and (if desired) an approximate summary estimate of cost.

(b.) *Design*.—Preparing complete design with plans, elevations, and sections, together with a summary estimate of cost as for a.

(c.) *Working drawings and details*.—Preparing the requisite working drawings and the detail drawings of construction and decoration.

(d.) *Estimate of cost*.—Preparing a special estimate of cost of construction.

(e.) *Execution*.—Drawing up contracts for, and letting and general superintendence of, the execution of the whole of the works, exclusive of special superintendence.

(f.) *Accounts, &c.*.—Checking and certifying the accounts, exclusive of measuring up.

For works of smallest cost the rate per cent. for the entire services varies from 5 per cent. on the smallest expenditure for the lowest class of building to 9½ per cent. for a like expenditure on the highest class of building; while for works of greatest cost the rate of remuneration varies from 2 per cent. on the largest expenditure for simple buildings to 5 per cent. on those of the highest class.

Fees on rebuilding or additions to existing buildings where a special design is necessary are calculated at one-fourth more, and where a design is not necessary at one-fourth less than for the same class of new work.

Advances on account during the work and in accordance with the rules shall always be paid to the architect on demand.

If the estimate be exceeded such excess shall not increase the fee, but the cost of duly sanctioned extensions or more sumptuous treatment of the work shall increase it.

All drawings remain the property of the architect. The client may demand copies of the design, but shall use them only for the work to which they relate.

This German tariff has been adopted by the architects of Belgium, Switzerland, and Italy; and has, I think, been printed at length in the London professional journals.

The remuneration of architects in Sweden is regulated by a system similar to that adopted in Germany; but, while the services to be rendered are similar to those there given, the rates of percentage are somewhat less.

The services to be rendered by an architect in Sweden, are:—

Esquisse, — Dessin net, avec un devis approximatif.

Dessins et plans principaux, — Dessins complets.

Devis et descriptions, — Calcul des fraies, avec indication des quantités et des prix, ainsi que désignation des matériaux, et du mode du travail.

Épures, — Tous les dessins de construction et d'ornementation.

Surveillance, — Stipulation de contrats d'entreprise et surveillance de l'exécution.

In France it has been decided by the Cour de Cassation as recently as 1875 that no law or regulation exists which fixes the fees due to an architect for private work: that the Courts should, in the absence of any agreement, regulate them with reference to the work carried out and the services rendered.

Public departments, such as the Ministère de l'Intérieur, des Travaux Publics, des Cultes, La Ville de Paris, &c., make special contracts, by which the architect, besides an annual salary ("traitement fixe annuel") is entitled to a commission ("traitement proportionnel") on the cost of the work; and, after their completion, he might be granted a further payment ("gratification"), not so much as a pecuniary advantage, but as an expression of satisfaction for work executed with economy and skill.

Although the fees of architects have never been fixed by law, because the art is a liberal one, they are, when not otherwise agreed, generally determined by the custom of the place or the scale fixed by the Conseil des Bâtimens Civils in 1800 and confirmed in 1841, by which the remuneration of architects employed by the Department was fixed at 5 per cent., the services to be rendered being defined thus:—

"Confection des plans et des projets,

La confection des ouvrages,

La vérification et le règlement des mémoires."

The whole question of "honoraires" was very fully discussed at the Congrès International des Architectes, held in Paris in 1878, and under the auspices of the Société Centrale des Architectes, and I would refer those who are desirous of more detailed information than can be here given, to the report of the proceedings of that Congress published in 1881 by the Ministère de l'Agriculture et du Commerce.

The subject has occupied the attention of the Société Centrale des Architectes not less than that of this Institute. In 1849 a committee of that body reported that 5 per cent. must be taken as a mean applicable to most cases; had been generally recognised by courts of justice, but by arrangement, by reason of the importance or otherwise of the services rendered, might be deviated from.

The following extracts from some of the communications made to it sufficiently explain the spirit with which the question was considered at this Congress:—

"Whatever the merit of the architect who conceives and executes, whatever the nature of the work, whatever the skill, care, and time devoted to the studies and to the superintendence, — always 5 per cent."

"The painter, the sculptor, obtain for their works their value; the physician, the counsel, charge their fee in accordance with their position and merits, and the care which they bestow."

"The counsel may have mistaken the case, and advised his client badly, but the latter pays the fees, and no more is said."

"The physician may have erred, his patient dies, and with him the doctor's mistake is buried; but nevertheless his fees are paid."

"The architect, however, receives always 5 per cent.; but if he makes a mistake, or is deceived, or if he has given way to concessions which may compromise his work, the critic is ready to seize with avidity on his fault, while justice is invoked against him with such rigour that even his future prospects may be affected, and that fortune and position to attain which the architect is ever struggling may be compromised."

"Pretended architects accept work on such terms that they cannot without loss perform the serious duties of the profession, but certainly if they thus lose their profit in other and less legitimate ways."

"The client who thinks he has made a good bargain is not aware that the architect obtains from the contractors more than the differences he has saved, and to obtain it sacrifices his liberty of action, and hands himself over to them."

M. Daviond strongly urged the impossibility of framing an equitable tariff, the inapplicability of such a tariff system to an open and liberal profession, and the necessity of leaving each practitioner to assess his own value and to make his own bargain in accordance therewith and the nature of the work to be undertaken. In the result, after very long discussion, the Congress arrived at resolutions to the following effect:—

The Congress, acknowledging the principle of freedom of labour and its unfettered remuneration which is established on the principle of supply and demand, is of opinion that every architect should appraise his work at such value as he may think fit, which should be a fair remuneration for the skill displayed and the special difficulties overcome. Nevertheless, in

the absence of any special agreement, it considers that the Avis du Conseil des Bâtimens Civils should be applied as a minimum until such scale has been modified in an equitable manner.

Thus, the result of the Congress was that the inevitable 5 per cent. was considered to be a reasonable basis of remuneration.

Here, in this room, the architects of the United Kingdom have, at great length, and for the last time twelve years ago, discussed the same subject and arrived at a similar conclusion, but having printed a document setting forth the opinions of this Institute and that Conference with reference to professional charges, it has been most unjustly imputed to the Institute that it partakes of the character of a trade union, an impression being somewhat general that adherence to the terms set forth in that document is an essential condition for membership of the Institute.

My own view of the position is this,—that the document expresses the ordinary custom of the profession, by which, in the absence of any agreement to the contrary, the relations between architect and client should be governed; but the architect is left perfectly free to himself assess the value of his work. If the circumstances of the case and the nature of the work permit him honourably to accept a lower rate of remuneration he is perfectly at liberty to do so; while, on the other hand, if he considers that his position in the profession or the value or importance of the services rendered entitle him to make his charge at a higher rate, or as has been done by a late well-known and highly-respected member of this Institute, without regard to percentage at all, he is perfectly at liberty to do so, and to secure the highest remuneration he can obtain.

The seventh question, "Are there any other important matters affecting the architect in his relations to his client or the contractor?" has not elicited any replies which need occupy your attention, but the ownership of the drawings is one which certainly merits the most careful consideration of the Conference, and may be considered under this head.

In France, Frémy Ligneville (vol. i., p. 229) declares the law to be that in the absence of any agreement to the contrary, the fees paid to the architect are considered to be due, not only for the construction of the building, but also for the preparation of the plans in accordance with which it has been erected. Thus the client can demand the delivery to him of these drawings, and the architect cannot claim any special fee for them; but the architect has the right to retain the plans and specifications he has prepared until his fees have been completely paid.

The sixteenth Article of the Institute document expresses the general custom that the drawings and specification remain the property of the architect, but recommends a distinct understanding with the client on this point.

The German architects, in the remarks appended to the tariff before referred to, dispose of the question thus:—"All drawings remain the property of the architect. The client may demand copies of the design, but shall use them only for the work to which they relate."

The third general head under which the questions were framed was that of "The Contractor," and in considering the replies and statements which I shall have to put before you, it must be borne in mind that the circumstances under which buildings are executed are so variable, and dependent upon so many conditions, that the information given must be accepted as only of general application, and not as representing invariable practice.

The eighth question runs thus:—"Is it the custom to employ a general contractor to execute all the works required to be done in a building, or is the contractor employed for each trade, viz., a contractor for masonry, another for carpentry, another for ironwork," &c.?

In Denmark both arrangements are usual. In Austria, in better class buildings, as a rule, separate tradesmen and contractors are usual for the several descriptions of work, as the master-mason or master-bricklayer, the stone-cutter, the master-carpenter, contractor of ironwork, plumber, &c.

In Germany both modes of letting work are practised. Where the client engages an architect he, as a rule, requires that the work of each trade be let separately. A great many architects, however, undertake the erection of

buildings for a lump sum, especially in cases where the client wishes to be insured against extras, desires not to have to deal with so many parties, and prefers the sole and exclusive responsibility of the architect to that of a multitude of individuals.

In England it occasionally occurs that the builder provides the design and drawings for the work he carries out; in fact, it is rumoured that builders who so proceed have said, "Oh, we keep an architect, and you need not go to the expense of employing one"; but the architect who contracts to carry out his own design is in these days, I think, quite unknown. If the practice does exist it would be most desirable that, if possible, full information should be given to the meeting respecting it.

In France the general practice is to employ separate tradesmen, an independent bargain being made with each; but the general contractor is not entirely unknown. The ordinary practice appears to be that what was, I think, formerly universal in England, and is still retained in the North. Mr. R. P. Spiers has communicated to me a letter from M. Pascal, a distinguished Parisian architect, in which he says on this subject:—

"Notwithstanding the advantage which may be derived from having one general contractor, we prefer special tradesmen who do their work better. The sole difficulty for the architect is to make them work in harmony with each other without reciprocally causing delays or prejudice to each other."

The general contractor naturally takes a profit from each sub-contractor, hence augmentation of cost. He cannot be competent in all the specialties which he represents. Hence inferiority in the quality of the work; two causes which lead to the system of division of the trades being preferred even to the extent that a general contractor is only occasionally admitted for the works of the State."

There is a growing tendency in England towards employing special tradesmen for important sections of the work, but the great saving of trouble and annoyance arising from the employment of the general contractor renders it hardly likely that the good old system of master tradesmen contracting for each trade will be revived, and handicraft thus suffers.

9. "Is it usual for a tradesman or tradesmen to contract to do the building as shown by the drawings and specification for a fixed sum to be paid to him or them by the employer?"

To reply to this question received from Berlin is so important, that I should have been glad to have had the opportunity of making further inquiry respecting it, but time has not permitted this, and I will therefore quote the words of Herr Ende:—

"Cases in which the erection of a building according to the design and estimates of an architect is let to a contractor who is not an architect are comparatively rare, particularly as regards elaborate and ornamental buildings, the reason being that, according to the ideas prevailing here, an artistic building can never be completely finished from the first design and the first estimate, but the chief and best portion of the work must be designed and worked out during its construction. There is, however, an end to this when a contractor undertakes the building. Alterations can then be made only under stringent and costly conditions, which give occasion to all kinds of disputes."

The ordinary French system appears to be *Marché au Rabais* or *Par série de prix*. Till recently *La Série de Prix de la Ville de Paris* was generally accepted as the basis, and each separate tradesman made his offer at a price to be calculated at a per-centage above or below such schedule of prices. Recently the *Société Centrale des Architectes* has issued a *Série de Prix*, and the authorities of the departments and the great cities have also engaged themselves on the preparation of similar schedules suitable to each locality.

The *Marché à Prix fait* or *à Forfait* is a contract for a lump sum, very similar to our ordinary contracts.

There is also another form of contract which removes the inconvenience attending that *par série de prix* of the client not knowing beforehand what the ultimate cost will be. This is known as the "*Marché de Maximum*," and combines both the preceding systems, the bargain being that the work is to be paid for in accordance with the *série de prix*, but with the reservation that the total cost shall not exceed a fixed sum.

10. The Committee then ask, "Is it usual to select a contractor by means of tender received from several tradesmen stating the price at which they will do the work?"

In Austria the best method of selecting a contractor is thought to be by competition, either a limited one among trustworthy firms, in which case the contract must be given to the lowest tenderer, or an open one, in which case the contract is not necessarily given to the

lowest tenderer; but to the most reliable one at the lowest possible prices.

11, 12, and 13. "Does a contractor make up his tender by means of measurements or quantities taken from the drawings and specification? Are these measurements prepared by the contractor or contractors for his or their own use, or by some other person for his use? Who pays that person?"

I feel much hesitation in dealing with these questions as they can only be satisfactorily answered as the result of closer inquiry than it has been possible to make.

In Denmark the contractor makes his measurements for his own use. They have no surveyors to take out quantities, and nothing is paid for them.

In Austria the amount due to the contractor is ascertained by measurement from the drawings of the work actually performed, and it is only as an exception that the measurements are taken from the work itself. The measurement and taking out of quantities are performed by the architect from the plans, but the contractor has to make out a measurement for the account.

In Germany estimates of quantities are prepared by the architect, or at least under his instructions by his permanently employed assistants. There are some few persons who occupy themselves exclusively in the preparation of estimates; but the architect has in all cases to check their work and be responsible for it. The system of "*verificateurs*" which obtains in Paris is quite unknown.

In France, the architect should provide besides the *Devis descriptif*, or specification, the *Devis estimatif*, or particulars of quantities, which documents, together with the general conditions, constitute the *Cahier des charges*. When a contractor tenders he employs a *Métreur* to take out quantities. This *métreur* is often a clerk in the contractor's office, and is paid by him. The *mémoires* and bills are checked by the architect or the *verificateur* paid by him.

In Germany the architect is responsible for the estimate of quantities, but he endeavours to diminish his responsibility by submitting the calculations to the contractor for the purpose of being checked and conforming to his criticisms; that is, adopting the same reckoning.

The responsibility of the contractor to the employer for losses caused by bad work and materials is in France and in Germany limited, unless otherwise stipulated, to a period of ten years, and I commend to the student of this subject the treatise of M. Masselin to which I have before referred.

Generally each of the correspondents appears satisfied that the system in use in his own country works fairly well, Professor Fenger making the necessary reservations:—1. That only competent persons are employed as architects and contractors. 2. That the necessary time is granted for preparing plans, specifications, and tenders, and for erecting the building. Generally reviewing the information which has been collected, it appears that the profession in England occupies a position in many respects more advantageous than in other countries, and, although the discussion will, I hope, advance towards a solution of some of the doubtful questions still capable of being mooted, there is, I think, but little which could with advantage be adopted from foreign practice into our own.

There are two subjects of some interest which were not touched upon in the questions prepared by the Committee, or alluded to by their correspondents, with regard to which I beg leave to occupy your attention for a few minutes. These are known in France as *Expertise* and *Privilege*.

Expertise relates to the course taken in litigation to inform the court upon technical facts, the endeavour to ascertain which is under our law generally made by the oral evidence of witnesses, who, from the very character of their retainer on behalf of plaintiff or defendant, often fail to dissociate from themselves the imputation of advocacy, and the nature of whose testimony has given rise to an observation attributed to a late eminent judge, that "professional witnesses not unfrequently become witnesses by profession." It is clear that in litigation in which technical matters are involved the court must obtain information from persons acquainted with the art or trade in question. The court has to apply the law on

the basis of facts of which it can only have cognisance when they are proved before it either orally or in writing.

The experts are generally three in number, are appointed by the court, and report to it. The parties may object to the nomination of an expert on certain defined grounds, such as relationship or connexion with one of the parties; having been in any way concerned in the proceedings; having expressed an opinion on the matter in dispute; or being known to be hostile to one of the parties. They are sworn to honestly fulfil their duties, and, when once sworn in, it is compulsory on them to proceed and make the report. They are not arbitrators, who are really judges, and decide the case; they merely ascertain the facts, and report their professional opinions. They hold an inquiry on the spot, the parties being summoned to attend, and having the right to be present, and to assist at the inquiry,—in fact, at all that forms a material part of the *expertise*, except the preparation of the report, which is, of course, carried out by the experts in private.

The report consists of two parts:—
a. The *procès verbal*,—statement of proceedings, and of the facts as ascertained.

b. The *avis*,—the opinion or recommendation at which the experts have arrived as the result of their consideration of the facts.

When the three differ in opinion, and are not of accord in making one report, such opinions and the grounds of difference must be stated without indicating which is the personal opinion of each. The court is not bound to follow the recommendation of the experts, but consults it for information, and makes such use of it as it thinks fit. It is, therefore, desirable that the reasons for the recommendation should be given, but that the mind of the court should not be prejudiced, as it might be by the names of the experts being attached to each opinion. Occasionally in English practice, in the Common Law divisions, and more frequently in the Chancery Division, the courts have desired to be informed of facts by independent experts instructed by the court; but, so far as I am able to form an opinion from cases I have read, the French system I have slightly sketched appears better adapted to ascertain the truth, and correctly inform the mind of the court, than our system of "*issues*" of witnesses, who are often cross-examined by counsel whose deficiency of technical knowledge places them at a disadvantage, while the contradictory testimony of the witnesses confuses the court, and obstructs the administration of justice.

The *Privilege* of architects and contractors over the works of construction they have carried out to secure them payment for their work, gives them the right of being paid out of the proceeds of the sale of the property in preference to the creditors of the owner, even as mortgagages. A similar privilege was accorded in Roman cities by Marcus Aurelius, but applied only to the rebuilding of destroyed premises, in order to give architects and builders an encouragement which would facilitate the embellishment of the cities by the prompt restoration of ruinous buildings. "*Ne urbs ruinis deformaretur.*" But, tempting as the prospect of thus securing payment may be, stringent formalities must be complied with before the *Privilege* can be obtained.

Thus, before the commencement of the work, an expert named by the Tribunal of First Instance of the district in which the works are situated prepares a *procès verbal* describing the condition of the property at the time, the object being (1) to preserve the value of the property as it exists before the works, for the benefit of the creditors who may already have a charge upon it; (2) to afford a basis for ascertaining after the completion of the works the augmentation of value of the property resulting from such works, and it is only over this augmentation that the *Privilege* can be exercised.

Within six months from the completion of the works they must have been accepted by an expert similarly appointed. He may be the same as acted at the commencement, but must be newly appointed. He prepares a *procès verbal* descriptive of the works and of their cost. These two documents must be registered at the Bureau des Hypothèques of the district, and it is only then that the *privilege* can be obtained.

Frequently, to avoid these formalities, architects and contractors are content with a charge on the property, either by the terms of the contract or by a separate deed; but this security

is far inferior to that obtained in the more formal manner.

There are other subjects upon which I might enter, but I must bear in mind that I am not protesting to read an exhaustive paper, but am simply bringing before you such notes as may serve to introduce a discussion on topics of interest to the profession, and that the most valuable portion of this evening will be that which affords the members of the Conference the opportunity of expressing their opinions and raising discussion upon some of the important professional questions to which I have alluded.

Permit me, in conclusion, to say that the cordial thanks of this Conference are due, and will, I hope, be warmly accorded, to those Corresponding Members of the Institute who have so kindly and so carefully answered the inquiries addressed to them by the Committee.

The Chairman expressed the thanks of the Conference to Mr. Cates for the labour he had taken in writing the paper in so succinct and clear a manner. The question of the responsibilities of the architect had been fully dealt with both in respect to the client and the contractors, jointly and separately; also the vexed question of the ownership of the drawings had been again touched on; and the mode of making the contract and the employment of a measuring surveyor had also been included, forming data for plenty of discussion; yet he thought they would probably come to the conclusion, after hearing what was the practice on the Continent, that the English practice was, after all, the best, avoiding the vices and appropriating all the virtues of the various systems in vogue elsewhere.

Mr. W. Woodward asked whether, in the cases referred to, where architects prepared their own estimates for the work, they received extra payment, or whether the charge for them was included in the percentage paid?

Mr. Cates replied that as far as he understood the communications received from abroad, the preparation of the estimates was covered by the commission. In Germany there was no special remuneration received for taking out the quantities. He could, however, only give the reply in a general way, as there might be exceptional cases.

Mr. J. Taveron Perry said he might mention as a matter of actual practice that he had been concerned in the erection of a building in Berlin, and had been associated with a German architect (Herr Lanner), who had prepared all the quantities himself, and they were sharing 6½ per cent. upon the whole building. They were superintending the work, and providing the whole of the quantities, and the quantities were not checked by the builder at all, and they formed the basis of the contract. There was a special commission of 1½ per cent., above the ordinary 5 per cent., for preparing the quantities, drawings, &c. He was pleased to hear Mr. Cates say that, in all foreign countries, architects were allowed to take out their own quantities, for unless they did so they did not do justice to the clients.

M. Chas. Lucas, of Paris, Hon. and Corresponding Member of the Institute, next addressed the meeting. He said:—Messieurs,—Le premier sentiment que je dois exprimer, après avoir remercié votre honorable Président des termes bienveillants dans lesquels il m'a présenté à vous, est, comme membre de la Société Centrale des Architectes, de constater avec satisfaction l'honneur qui réjaillit sur elle de voir ses efforts aussi bien appréciés par vous, comme collaborateur du *Manuel des Lois du Bâtiment* et comme secrétaire du Congrès International des Architectes de 1878, de me féliciter des emprunts que l'honorable M. Cates a bien voulu faire à ces deux ouvrages. Mais, veuillez laisser à l'étude les différentes questions qu'il a soulevées, surtout les deux plus importantes, les Honoraires et la Responsabilité; et je vous promets, ou plutôt j'espère fermement que, d'ici peu, la Société Centrale des Architectes qui reprend, elle aussi l'étude de ces deux questions, vous fournira quelques nouveaux éléments. Pour les honoraires, un grand nombre des membres de la jeune génération, de ceux qui sont engagés dans la lutte de chaque jour, voudraient sortir de l'usage du 5 p. 100 et tenter d'acclimater en France un tarif douplement proportionnel, dans lequel le chiffre d'honoraires croîtrait avec la somme de travail et de talent exigés de l'architecte et décroîtrait en revanche par suite de l'augmentation du chiffre de la somme dépensée.

Mais ce tarif, tarif venu d'Allemagne et édicté au Congrès de Hambourg de 1868, est à notre avis, trop compliqué pour pouvoir jamais servir à régler en France les obligations du client envers son architecte; et, à mon seul personnel, un tarif français, plus récent, imposé par la Ville de Paris à ses architectes et décroissant par 2 p. 100, depuis 6 p. 100, pour les premiers 200,000 f. de travaux jusqu'à 4 p. 100 de 800,000 f. à 1,000,000 et restant ensuite à cinq de 4 p. 100, semble beaucoup plus pratique; il est vrai que ce tarif municipal offre cette lacune de ne pas tenir compte de la nature du travail et rétribue autant l'architecte qui construit une Église, égalité dans la rétribution qui est tout-à-fait contraire au principe du tarif allemand. Il est un autre danger que peut soulever l'étude de la question des honoraires, danger apparu dans nos discussions en 1878, et qui pourrait amener des rivalités dans une société confraternelle: ce serait d'attribuer, dans un tarif édicté au nom d'une Société, des honoraires plus considérables aux Architectes qui auraient une plus grande notoriété d'études ou de talent, et de créer ainsi des officiers de tous grades dans cette armée formée par les membres de notre profession libérale confraternelle. Quant à la Responsabilité, un seul mot; au récent Congrès de Nice cette question est revenue à la suite d'une remarquable Conférence de M. Hermant, l'un des principaux collaborateurs du *Manuel des Lois du Bâtiment*, et il a été exprimé un vœu dont la Société Centrale des Architectes étudie la réalisation, vœu appelant la création d'une *Caisse dite d'assistance Judiciaire*, et destinée à soutenir, après examen par le Conseil Judiciaire de la Société, certains membres adhérents à cette Caisse qui, attaqués à tort dans une question de Responsabilité, ne soient pas en mesure de supporter les frais d'un procès de cette sorte, procès toujours long et fort coûteux. Je ne sais si je me fais bien comprendre et si j'expose suffisamment tout l'intérêt d'une pareille création; mais elle me semble appelée, si elle est réalisée, à faire honneur à toute Société qui l'entreprendrait, et à resserrer les liens de confraternité qui doivent unir tous ses membres.

Mr. E. C. Robins remarked, in regard to the ownership in drawings, that there was generally no demand made upon architects for them except in cases where a plan of the drains was required. It would be inconvenient if persons could not procure plans for the purpose of setting such matters right. In his own practice, he had usually furnished to the owner a plan drawing showing the drainage, ventilation, water supply, &c. Public bodies, however, sometimes required many more plans.

Mr. E. G. Bruton (Oxford) mentioned that some years ago he designed a building for a limited company at Oxford, and the company demanded the drawings. He replied by sending in the rules of the Institute, but the answer he received was a request to supply the name of his solicitor. Rather than contest the matter at law, he sent in the drawings.

The Chairman.—That is not an uncommon experience, I am afraid.

Mr. J. B. Fraser (Leeds) remarked that, in the course of a long practice, he had never been asked for drawings beyond those showing the drainage. As to quantities, he believed that in the provinces they were always prepared by the architect. A surveyor was totally unnecessary, and was often the cause of mischief.

Mr. Alex. Payne asked whether the provincial architects made an extra charge for preparing the quantities?

Mr. Fraser said,—Yes, certainly; a commission was charged in addition to the usual 5 per cent., and it was paid by the proprietor.

Mr. Blashill asked who took the responsibility for the correctness of the quantities in the cases named,—the architect or the builder?

Mr. Fraser replied that, as a rule, the quantities formed the basis of the contract. The architect took the responsibility to a certain extent. If he made a mistake he would know where to supply the deficiency, or curtail in the details.

Mr. Riddett said that when the London School Board employed an outside architect, it stipulated for a set of the tracings to be sent in. The architect retained the drawings, and the Board had tracings of them. As to the practice of taking out quantities, the method in the country differed from that in London. No London architect of repute could afford the

time to sit down and take out the quantities. He had made a resolve for himself never to be the judge in his own case. To be the architect and the taker-out of the quantities seemed to him to be incompatible, and tended to hurry and slovenliness in the drawings. Could they expect the builder to accept as correct the quantities taken out by an architect? Builders in London had more regard to the name of the man who took out the quantities than to the name of the architect. Of course the country architect had difficulties to contend with. If there were such a person as a surveyor at hand to take out the quantities it was not always advisable that the country architect should employ him. On the other hand, the country architect could not be expected to employ a London surveyor to do the work of taking the quantities. Therefore the only thing to be done was to make the quantities, when taken out by the architect, the basis of the contract.

Mr. John Honeyman (Glasgow) thought that in the North they had the best system of all, provided that both the architect and the surveyor were competent. Such a thing as an architect in Glasgow taking out the quantities was unknown. They had measurers who did that work. But it did not follow that the architects did not understand quantity-taking. On the contrary, they had to understand it in order to check the measurers, so that mistakes should not be made detrimental to their clients. The plans were drawn so completely before being put into the hands of the measurer, that the latter had no room left for imagination at all. They found that system worked very well. In respect to the selection of separate tradesmen, their plan in Glasgow corresponded with that described as being in vogue in Austria and Denmark. It had been departed from slightly in some parts of Scotland lately, but it was the general practice, and conducted decidedly to the excellence of the work done, though it caused the architect a little extra bother than the alternative plan. As to ownership of drawings, the Scotch practice was to give any that might be asked for. There was a growing demand for the drawings on behalf of corporations. It seemed useless to attempt to keep possession of their drawings; and they would probably know that a Bill was before Parliament relating to "Sanitary Supervision of Buildings," in which it was provided that plans of every building erected should be lodged with the local authorities, so that copies might be obtained by any one who required them.

The Chairman.—You have not told us on whom the responsibility is fixed for the accuracy of the quantities.

Mr. Honeyman replied that the quantities were, in their original form, made the basis of the contract, and the work was re-measured finally.

The Chairman.—What happens, under your plan, if, on the final measurement, the quantities are found to be defective?

Mr. Honeyman replied that such a case seldom occurred, but he supposed the client would bear the consequences of the mistake of the measurer.

Mr. Boardman (Norwich) said, in regard to drawings, he had been asked to supply those of the Norwich Hospital, but he anticipated that his clients expected to pay for them.

Mr. Bateman (Birmingham) said the old question of quantities had managed to crop up again, and he should be glad if some uniform action in London and the provinces could be devised, but he hardly hoped that they would be able to assimilate the practices. The local practice in the Midlands was for the architect to take out his quantities. He had always failed to see why any errors in the quantities on which the contract was based should not be subject to revision when the work was completed. He had known eminent surveyors put their hands in their own pockets and reimburse builders for works executed beyond those inserted in the quantities, thereby placing in the building-owner's pockets value for works executed, but never paid for. As to whether the architect or surveyor should take out the quantities, that seemed to be only a matter of convenience in practice. For thirty or forty years he had continued to take out his own quantities for works of moderate dimensions. In large buildings, of course, an architect could not devote the necessary time to it. But as the Institute had taken somewhat firm ground in reference to the taking out of quantities, he thought there was a feeling that the architects in

the country who took out their quantities were under a sort of ban, or were considered by the Institute as being under some disadvantages professionally, compared with those who employed surveyors to do the work. (Cries of "no, no.") But whether the quantities were taken out by the architect or by the surveyor, they should, in all cases, form the basis of the contract. He had known cases where considerable errors had arisen on the part of the surveyors, and where the surveyors had had to reimburse the contractors; but that state of things ought not to exist. As to the drawings, he had been asked for them in the case of a public building, and he had made a charge of thirty guineas, which had been willingly paid.

Mr. H. W. Pratt suggested that if the builder in all cases returned the drawings to the architect, they would be sufficient if the architect supplied them to the owner, when he required possession of the plans.

Mr. Howard Collis said that, as a builder, he was of opinion that when an architect took out his own quantities they should, without reservation, form the basis of the contract. He must say that in his experience architects' quantities were not, as a rule, of a very high order; but in any case they should be bonafide part of the contract. It was more satisfactory, however, that the quantities should be taken out by some independent party as between the architect and the builder. There was a question in which builders were still more interested, and that was as to the form of the contract which was submitted to them. The Institute and the Builders' Association of Great Britain had agreed on a form of contract, which was perfectly straightforward and fair; but very often architects, and members of the Institute, too, would present another form, which he (the speaker) was bound to say was a matter of complaint among builders. What would be thought of a merchant who should offer to a shipbroker a form of charter-party other than the well-known and printed form? Why the broker would laugh at him; and so the builder might be entitled to treat the architect who did a similar thing in a similar way. He hoped the Institute would endeavour to get its form of contract used in all cases.

Mr. Stanley Bird said that, from a builder's point of view, he considered it an injustice to the contractors to have any other than the regular form of contract offered to them. It was only during the last four or five years, since the formation of the National Association of Master-Builders, that they had succeeded in getting that form of contract introduced into the provinces and generally used. The "form," however, was not quite perfect, and some slight alterations were desirable, including the point of the quantities. It was not sufficiently stated in the form that the quantities should form part of the contract. It was difficult for provincial architects to get a surveyor to take out the quantities properly, and that was a good reason why architects did the work for themselves; but the quantities should always form part of the contract, and that point would no doubt be considered very soon now by those interested. Another question, and one that had not been touched upon, affecting builders, was that of "arbitration." He would not enter into the matter now, but it was a question that ought to be settled.

Mr. Watkins (Lincoln) said that if the quantities were taken out by a fully-qualified surveyor, or by the architect himself, and in either case paid for directly by the client instead of by the builder, they would hear no more of this question. He believed that the building surveyor had never yet suggested such a course as receiving his money direct from the building owner, as the architect received his commission. He suggested this course at the last Conference. As to making the quantities part of the contract, he had done that for the past fifteen years. Architects in the country were obliged to take out their own quantities. They could not conveniently get the work done in their own towns, and they could not afford to employ a London surveyor. As an instance of the way in which the employment of a quantity surveyor sometimes worked, he related a case where a building was wanted, to cost 27,000*l*. It was necessary to cut down the quantities that had been taken out,—that was charged for at an additional 1½ per cent. Then some transfer of quantities from one part to another was required, and that was charged for also at 1½ per

cent. Then some additions were wanted for variations of the original plan, and that led to another charge of 1½ per cent., and altogether the quantity surveyor received about 900*l*.—almost as much as the architect itself.

Mr. Wyatt Papworth desired to know whether the foreign contractors could get rid of their obligations in less than ten years by the process of bankruptcy, as was sometimes done here?

Mr. Blasbill said the substantial reason of the London system of taking-out quantities was that it was a convenience to the client to know exactly what the work would cost. It was not always a question whether the client was an honourable man, but whether he could afford to spend more than the intended amount on the building. To have to pay 500*l*. or 1,000*l*. more than anticipated, in consequence of a mistake in the quantities, was not always pleasant for the building owner; he therefore preferred the employment of a quantity surveyor.

Mr. C. Aldridge (Liverpool) thought the question of quantities had been thrashed out at the last Conference, and he did not think they would ever arrive at uniformity of practice in London and the provinces. The provincial architects had not undertaken the duty of taking the quantities for the pleasure or the profit derived from it, but because circumstances had forced them to do it; for, even where there was a surveyor in a small town, it was not always desirable that all the architects of the town should employ him. The client had an advantage from the architect preparing his own quantities, because the latter could the better limit the work to the amount to be expended, and attend better to the construction of all the details. The drawings were also more complete when the architect took out his own quantities.

The Chairman, in proposing a vote of thanks to Mr. Cates for his paper, observed that in France the architect seemed to have more absolute power over the client than the English architect had, but he thought the English architect had an advantage in keeping a client, once obtained, and often making him a personal friend for life. The scales of remuneration of architects on the Continent were somewhat complicated, and he believed that the English architects would prefer their simple 5 per cent. He observed that the simple 5 per cent. had been approved of as the best by one of the French congresses held two or three years since. As to measuring surveyors, he believed they were a useful body of men, as they acted as intermediaries between the architect and the client, and enabled the architect to devote all his attention to the design. In regard to drawings, he mentioned a case of his own where, having given the builder the plans for five houses on an estate, the latter took an idea from one, and an idea from another, and covered the estate with houses "after the designs of Mr. Barry."

Mr. Cates, in replying briefly and generally to the observations that had been made, corrected the impression that had been expressed that the Institute regarded the provincial architects who took out their own quantities as belonging to a lower grade of the profession. The contrary was really the fact, because the man who could both design and plan and take out the quantities was, perhaps, a better man than he who could only do one of those things. He regretted that more time had not been devoted to discuss the newer points in his paper, because the question of quantities had often been discussed, and he really tried to refer to it as little as possible in the paper, so that it should not, as he hoped, be discussed as a prominent feature of the debate.

On Wednesday morning the third meeting of the Conference was held, Mr. Edward P. Anson, vice-president, in the chair.

Mr. Thomas Blasbill then read the following paper:—

THE TENURE OF LAND FOR BUILDING PURPOSES.

THE tenure of the land upon which buildings are erected is a matter of the greatest public importance, and one which, from various causes, is now receiving an unusual amount of attention. So far as it affects the condition of buildings, their capacity for improvement, and their influence upon owners, occupiers, and neighbours, it is a question belonging peculiarly to our own experience. We should therefore be able to deal with it practically, and unbiased by considerations of class or party.

With the view of assisting us in the discussion of this subject, inquiries have been made of our foreign correspondents as to the customary tenure of building land in the chief European countries. We find that in France, Germany, Austria, Denmark, and other countries, buildings are erected only upon land which we should call freehold, so that there is no such question as that which is now before us, and we can learn nothing from their experience of different tenures. If our country resembled any of these in its capacity for business, and in the prosperity of its population, their example would be of great value, but in existing circumstances we shall probably do well to study the subject from our own point of view.

We shall, no doubt, agree that, in principle, it is best for a man to be able to build upon his own freehold land. He ought to be the best judge of his requirements and of his means. If he builds on speculation, or for investment, he ought to know best the wants of his customers, or tenants, and the price at which they will buy or hire. It is most to his interest to keep the premises in good repair, to alter them judiciously, to enlarge or rebuild, as circumstances require. If his judgment is good, the gain is his; if bad, the loss is his. But if, through the tenure of his land, he has to submit his judgment to some other person, he is very likely to be fettered in his action, and may have to pay heavily for liberty to do what he considers best. This freehold tenure is what each would think best for himself. It is also best for other people if we add the restrictions that are required in the public interest, and those which may be desirable between neighbours for their mutual advantage.

The tendency of modern legislation has been to promote the conversion of other ancient tenures into freeholds, and to make the freeholder, though he may be only a tenant for life, more free in the use of his land. If the land is in London or any of our larger towns, the use which he makes of this freedom is to dispose of it on building lease, so that the property, which before might be tied up only for the present generation, becomes tied for the duration of about three generations to come. Our subject may, therefore, be limited to the forms of leasehold tenure on which land is now let for building purposes, and specially to the system of terminable leases, which has for a considerable time prevailed in London, and is being extended to our largest provincial towns. And it will be useful to bear in mind the convenience of freehold tenure in judging of other modes of holding building land.

Now the system by which a person intending to build hires a piece of land instead of buying it, and covers it with buildings which his representatives must, at the end of ninety-nine, or ninety, or eighty, or perhaps only sixty years, give up in tolerable repair to the ground landlord, is one which is peculiarly liable to be misunderstood by those who are unacquainted with such business. As a subject for a telling speech or a smart article, we are familiar with the picture of rows of houses run up to last only so many years as the lease will endure. They are supposed to fall in pieces about that time, after having been during their later years the disreputable means by which the middle man has satisfied his "greed" at the expense of the unfortunate tenants. At the end of the lease the holder is a poor widow who is solely dependent upon the property, and finds it "confiscated" "without any compensation" by the ground-landlord, who, moreover, endeavours to make her restore it to a habitable condition.

It is hardly necessary to point out that these pictures give no true idea either of the nature of the transaction or of its practical results. The deliberate building of a house to last for about the term of the lease is a popular fallacy. The buildings with which it is connected are the work of the worst class of speculating builders, who have no interest in or care for the length of the lease. They build to sell, and they hope that their own interest will cease as soon as their buildings are finished. Under such conditions they would build as badly on their own freehold ground, or worse, for they would in that case be free from the supervision of a ground landlord. Houses of this class seldom last for half the usual term of a building lease without serious dilapidations. I have had to procure their demolition before they were finished, and have known them to become uninhabitable before they were occupied. Some of the worst of these buildings have been built on

the speculator's own freehold ground. When houses are manufactured in large numbers for sale it is highly improbable that the buyer can exercise any useful supervision over their erection, and nothing but building regulations of a stringent character can prevent this kind of work, or give a chance for the respectable speculator to compete with those who have no desire to build substantially,—perhaps no knowledge, even, of the ordinary principles of sound building. The regulations in our Metropolitan Building Acts are more lax than those of many provincial towns, and far behind those of the large Continental cities. They may, nevertheless, be quite equal to the demands of the public, for a very large proportion of our population do not practically call for well-built houses by showing a readiness to pay for them.

But the man who builds for his own occupation or investment, and intends to keep the property in his family, will hardly have the folly to build in an unsubstantial manner, for any serious defects in construction will show themselves within the term of a building lease, and the penalty would fall upon him or his near descendants. A man of ordinary prudence, having built substantially on his leasehold ground, will, if he cares more for his posterity than he does for himself, lay by a sum which will probably be only a few shillings per annum to form a fund that shall, at the end of the term, be equal to the original cost of the building. If (as may be very reasonable) he cares more for himself than for his remote and problematical descendants whom he will never see, he will allow the matter to take its course. At every change of ownership, whether by inheritance or by purchase, and at any time during the continuance of the lease, the temporary leaseholder will know how long the property will remain to him and how far that influences its value. If he has the ordinary good fortune of the London leaseholders of past times, he will be in receipt during the latter half of the term of an income from the property very considerably in excess of that calculated upon by the original lessee, while he will still be paying only the original ground-rent of one-half or one-fifth of the increased value of the building plot.

Meanwhile the ground-landlord has been unable to share in this prosperity. If the property be in central London, he may still be receiving the ground-rent fixed early in this century, when men of business lived over their shops and offices in streets lighted by oil-lamps, before railways, free trade, telegraphs, cheap postage, cheap newspapers, and all the aids to commerce which have marked the last two generations, were in the least foreseen. The ground-landlord in one of the suburbs may still be limited to the rent fixed when that suburb was an outlying village, without trade, without cheap communication, and separated from the great centres of business and of pleasure by roads infested with footpads by night, and, according to modern notions, hardly passable by day. The improved rentals, which he may never live to enjoy, are probably shared by middlemen, representatives in different degrees of the interest of the original lessee.

In discussions of our leasehold system these considerations are generally overlooked. In a paper in the *Fortnightly Review* for March, by Mr. Broadhurst, M.P., who has taken a great interest in this subject, and whose Bill for enabling leaseholders to purchase the fee-simple was lately before Parliament, there is this story, which the writer evidently thought to be a strong support to his case:—

"A person had bought the remainder of a lease on a West-end estate, and towards the end of the term he sought a renewal. The terms offered were as follow:—1. That the original ground-rent should be increased from 10*l.* to 50*l.* per annum. 2. That a fine of 1,400*l.* should be paid for the privilege of renewal. 3. That 500*l.* should be expended in repairs by the lessee."

Now, it will strike men of business that the thing which would have shown whether this was fair to the lessee or hard upon him, viz., the actual present value of the premises (which he had, no doubt, bought prudently, but which he seems to have neglected) is omitted from these particulars. The same fault usually marks such stories as these, by a lessee who desires to have a benefit that does not belong to him, practices on the good nature of a sympathetic member of Parliament.

Every loss which a lessee may sustain can be estimated in pounds and stated in figures. We shall probably be of opinion that the losses said to be incurred by the holders of terminable leases (which have been entered into with ordi-

nary prudence) will not bear that test; but it does not therefore follow that terminable building leases are desirable as a system and to the extent to which they are now being adopted. When the original parties to the lease have passed away the property has to be managed for some two generations under the covenants made by these dead people, and with strict reference to the supposed interests of a reversioner who may not yet be born. The character of the neighbourhood, the circumstances of the property, may be entirely changed, and the only person who can adapt the premises to the new conditions is the then holder of the lease, who, besides, may have his own means of increasing the value of the premises to himself without any real injury to the ground landlord. He may even desire to rebuild or greatly improve the premises for the benefit of both parties. In any case he must apply for the consent of another person, who may exact an enormous consideration for it, or may, from ill nature, refuse point blank. If he is not really in bad hands, he may find that through the nervousness of trustees, or the caution of professional advisers, he is so hampered in his arrangements that his scheme has to be abandoned. If his lease is about half run out, the cost of extensive additions will fall so heavily on the short remainder of it, that he may then be tempted to build in a flimsy manner. When the lease draws still nearer to its end, it is decidedly against his interest to keep the premises in proper repair, and the Legislature, in passing the Conveyancing Act of 1882, has taken such care of the interest of such persons, that it will now be exceedingly difficult for the ground-landlord to compel the performance of repairing covenants. Hence arises much of the present outcry against leasehold property, though it will be found that much of it is really due to the indifference of freeholders, who are, perhaps, only tenants for life. These results of the system of terminable leases are a matter of public concern; for it is to the public injury that large areas of the metropolis should be checked in the ordinary progress of improvement for the term of two generations. It is a matter well worthy the careful consideration of those most intimately concerned with the working of the system,—the ground-landlords and their professional advisers. In my own experience I am bound to say that I have found that in dealing with the larger corporate bodies, and with the ground-landlords of large private estates, the tenant has usually been treated not merely with fairness, but with the liberality which one likes to see accompanying the sentiment of ownership. I have also known the owners of a small estate make a great sacrifice to relieve an unfortunate tenant. But there are some large public bodies who are said to be not so well advised that they can safely be trusted to act liberally, and small people cannot be trusted to any great extent.

I do not, however, think that we shall approve recent schemes for the compulsory purchase of leaseholds. Such schemes would enable a lessee who desired to improve the property to become the owner of it, and so far that would be to the public advantage. But it would open the door to a class of schemers who would use the enfranchised leaseholds as a means of injuring estates on which none of the evils now complained of really exist. It would be a strange mode of rewarding the owner of neglected leasehold property if we enabled him to buy at the price which a willing purchaser might give for the rookeries which are the result of his neglect.

Before we consider improved forms of tenure it may be interesting to give the view of the only permissible form according to the ideas prevalent in Spain. Señor Belmas, writing from Madrid to Mr. Benet Spiera, says, "Every one who wishes to build begins by purchasing his ground, and, without being the absolute proprietor, no one would think of building even the least thing. On the contrary, if by chance what is done in England were known it would astound every one." Are we in London prepared to return to that primitive system? or to pass any Act of Parliament that would practically enforce it? There is a Royal Commission now sitting, which will doubtless tell us how it is that in England,—the most prosperous country on this side the ocean,—men will not, as a rule, even when they might, acquire the freehold of the houses in which they live; why, when they happen to be the proprietors of their cottages, they sell them on the first opportunity; why the Englishman devotes a smaller propor-

tion of his income to house-rent than any other man; why house-rent in London is cheaper (like for like) than in any important Continental city; and how it happens that the average London householder does not live more than three years in the same house. If it is argued that any of these things are due to our system of terminable leases, they will find that they exist and have long existed, so far as a comparison can be drawn, quite independently of them. If it is argued that the slums of our great cities are due to the leasehold tenure, we may ask how it happens that evils quite as great have arisen in the great American cities, from New York to Chicago, where no such leases exist; and why the slums of Paris, though less extensive than our own, show, if possible, more shocking phenomena.

For our own part, we have to deal with things as they exist. In a state of society in which it is more convenient to build upon leasehold land than to buy the freehold, we must consider how much of the convenience which belongs to freehold can be grafted upon the leasehold tenure, especially in the point which most affects the public interest, which is to secure to persons having control and substantial interest in buildings reasonable liberty and encouragement to improve the property.

There are, in various parts of England, customs of holding land subject to chief-rent, or fee-farm rents, about which I hope we may hear something from those who have practical experience of their working. The effect of such terms is to create what we might call leases in perpetuity, if such things were legally possible, and the best example of this on an extensive scale is found in Scotland, where building-land is commonly let on what is called a "Fen Charter." By this system the tenant is bound to keep a building upon the land of twice the annual value of the amount of the rent. The rent does not increase, but it is easily collected, and forms, in Scotland, the best available kind of investment. We may hope to hear from some of our Northern friends the advantages and the disadvantages (if any) of their system; but it appears that if this tenure were known here, and the habit grew up of investing in such securities, the objections to building leases would disappear. It appears also that the ground-rents under such a tenure would rise very considerably beyond the rates that are now paid. The increased rent should not only remunerate the ground-landlord for the loss of the reversion to the site at the end of a terminable lease, but it would include some share of possibilities of improvement which are prevented by the present system, to the loss of both lessor and lessee.

There are certain classes of ground-landlords, such as corporate bodies, charitable trusts, and some heads of families who might not be tempted by these increased rentals. But the ordinary owner of land for investment may well consider the advantage of such a system of letting building land. I feel sure that its adoption would lead to the application of the same system in many cases where a lease has so many years to run that the present owner of the freehold cannot expect to enjoy the reversion. In such cases it would be easy to ascertain the value of that reversion, and to fix an increased ground-rent which would give the present owner the full income which his land may now be worth. Probably such leases would be made renewable periodically at a fixed nominal fine; but the precise shape which the legal business would take is a matter for lawyers rather than for surveyors.

I understand that in Aberdeen a system has grown up of letting building-land for a term of sixty years, the ground-rent to be doubled after a lapse of the first twenty-five years, for some reason which I fail to see. If we admit the principle of an increasing ground-rent, it would seem more fair to provide for a revaluation of the ground, say three or four times in a century, and at such times renewing the lease at the new rent. This would make the leaseholder in the same position as the holder of freehold land except that he must allow the ground-landlord to share in the increase (and possibly in some cases the decrease) of the value of the property.

There is in the West of England a very important question arising out of the local custom of building upon leases for lives. Whatever the advantage of such a tenure may have been in past times, its uncertainty conveys to us the idea of a gambling transaction, such as must be

highly prejudicial to business. It is, of course, possible to insure the lives, and every careful lessee would do so, but the cost of such insurance, and some share in all the other inconveniences of such an uncertain tenure, must fall on the ground-landlord, and it seems surprising that such a custom has not been abandoned in the interest of both parties.

In bringing this subject before the Conference, I have endeavoured to touch upon the questions which are of the greatest importance, but I do not suppose that I have included everything that is worthy of consideration. We can have (as I have hinted) no political views; we are, therefore, the more able to place the whole matter in its true light, so that defects in existing customs may be remedied by those who are practically engaged in the management of these transactions. Possibly, also, those who desire to deal with questions involved in the ownership of land devoted to building purposes may learn something in the course of this discussion that will help them to clear and just views of a subject which at present does not seem to be very well understood.

In the discussion which followed,—

The Chairman, in inviting discussion, said that he did not gather that Mr. Blashill had set forth any views of his own as to the proper course which should be adopted. Therefore it was open for the members to discuss the matter, and to suggest their views.

Mr. John Honeyman (Glasgow) would have liked to have heard a little more from the gentlemen present before speaking on the paper, but in response to invitation he would be happy to afford any information he could on the feuing system of Scotland. There was a great deal of misapprehension generally as to the working of the leasehold system in England and elsewhere. Speaking for himself, he would confess that before he had looked into the subject more fully he felt very much prejudiced against the system; but the last thing that would suggest itself to him as a remedy for the evil would be the interference of Parliament in the matter. Reform would be likely to spring from increased enlightenment on the part of those who were specially interested, and it would be doubtless better for the community at large that both parties to any contract of the kind should be perfectly free. The evils of the leasehold system had been greatly exaggerated, and this had been clearly brought out by Mr. Blashill in his paper. Indeed, the chief evil seemed to be the power of the ground landlord to interfere unduly during the currency of the lease. In that respect there could be no doubt that the system in the North was superior, there being no interference so long as sufficient value on the land insured the payment of the feu. The system of feuing the land was simply this—it was equivalent to a perpetual lease. The land under the feu charter was conveyed absolutely to the feuer, and it became his property to all intents and purposes so long as he paid the feu duty. There was no interference on the part of the ground landlord unless the feuer had come under covenant to do certain things upon the land, which, of course, was frequently the case.

The Chairman.—Do I understand you to say that the feuer is under certain covenants to do certain things?

Mr. Honeyman said that it frequently happened that to secure the amenity of any locality this was the case. For example, there was a condition in a feu-charter that only dwelling-houses were to be erected upon the land, and possibly in conformity with certain plans. The charter generally went to the length, too, of providing that a certain building line should be adhered to, and as long as the conditions were kept the land became the property of the feuer, and remained his so long as he paid the feu duty. It was a sort of compromise between the Spanish system, which required the absolute purchase of the ground, and the English system, by which the land was simply secured for a certain number of years. It did not entail the expenditure of so large an amount of capital to begin with on the part of the man wishing to build; in point of fact, he did not spend anything on the land, but only began, the year after completing his bargain, to pay a small sum. The thing was very simple, and he did not think he need say anything more about it. There was also this great advantage to the proprietor, that he had no trouble at all connected with the land. The feu duties were a first

charge on the property, and he had no trouble whatever in their collection. This was one point, therefore, which might lead freeholders in England to wish to dispose of their land, and to consider whether it would not be well for them to adopt such a system. A larger ground-rent would thus be obtained, and they would have decidedly less trouble, with freedom from litigation and all the expense arising especially at the termination of a lease. His own impression was that it would really pay a ground landlord much better to adopt this system. It was a question of assessing the value, but that, as Mr. Blashill had said, was a matter which could be easily worked out, while it would be unquestionably better for the architecture of the country if the holdings were perpetual; his impression, after studying both sides of the question, was, that it would actually be better for the ground landlord also.

Professor Kerr remarked that the Scottish system was, in plain phraseology, simply a perpetual lease. Mr. Honeyman's idea, that a certain change in the value would be accomplished by means of a change of tenure from a terminable to a perpetual lease, was financially quite a mistake, because the value of a thing was what it brought, the more especially in transactions of this kind. It was therefore unnecessary to discuss that point. The perpetual lease was often granted in England, and the ground-rent of it was simply what the ground for the moment was worth. It would not, therefore, make any difference whether it was a lease for 50, 60, or 90 years, or, as in Scotland, a lease for 999 years, or for perpetuity.

The Chairman.—Do I understand that the feu system in Scotland is for 999 years?

Mr. Honeyman.—Sometimes, but that is not called a feu.

Professor Kerr continued that, so far as they were concerned, it was a perpetual lease. The system of granting leases was a thing which had grown up in England, not arbitrarily, but as part of the business of the country. Doubtless one most important factor in the production of this system had been the desire on the part of great families and corporations to perpetuate the possession of the land. The same principle might be said to prevail in Scotland; but as a Scotchman he was prepared to say that Scotland was far in the rear of England in commercial transactions, and it was a mistake to make any comparison between the two countries upon this question. In London, where its effects were most notable, there could be no doubt that business suffered very considerably in certain respects in consequence of it. Every matter of advantage in business had its counterpart in disadvantage, and the disadvantages of the system were great and crying. At the same time he agreed with what he understood to be the drift of Mr. Blashill's argument. It was not so easy to get rid of the disadvantages, but he did not agree with Mr. Honeyman in supposing that Parliament ought not to be encouraged to interfere. It was a great detriment to commercial business, in which regulation might fairly be said to be necessary. The absolute freedom of landlord and tenant in their contract was a pretty thing in theory, but in practice, as in other matters, it required regulation. Too often the typical landlord, when he found he had got the tenant in his power, made use of this power to his own advantage as against that of the tenant. Measures had been successfully brought into Parliament some time ago whereby tenants in London were to be empowered to purchase their lands. He agreed with Mr. Blashill that this was a measure which could scarcely meet with the approval of practical surveyors. It might answer all the purposes which Mr. Broadhurst had in view, if Parliament were to give the tenant the right of a renewal of the lease under certain circumstances in order to further the operations of an improvement on the property. If there were a statutory right of renewal instead of a statutory right of purchase, it might do all that was necessary, without the interference of the prerogative of the ground landlord. There was one forcible consideration in connexion with land tenure—viz., that the value of the ground was really created by the public. It was not inherited by the owner, but was caused by the extension of the town, by the traffic, and by the necessities arising out of it. He did not say that they could fairly introduce that into the argument in regard to the

commercial transactions between landlord and tenant, but it was a consideration which in equity had a very great weight. When, therefore, he heard of ground landlords in London maintaining the bars across the roads, for the purpose of keeping up the value of the ground-rent, he thought the fact had not been sufficiently taken into account that the value of the land had been created by the very traffic which those bars impeded. And when the ground landlords came to Parliament, as some day they would come, to claim compensation for the alleged depreciation caused by the throwing down of those bars, some one should bring forward the argument that the very value with which they are dealing had been created by the traffic they had been impeding. Some of the great corporations in London were not at all liberal in these matters. He was sorry that Mr. Cates was not present, but his (the speaker's) opinion was, that the Crown dealt very illiberally indeed in connexion with the matter. Take the case, for instance, of Howell & James, who had spent a great many thousands of pounds upon their premises on a thirty years' lease. He believed they applied *ad misericordiam* for a little extension of the lease, but that it had virtually been refused. He also knew of a case in which there were only thirty-two years remaining, and where the houses were actually worn out. It was necessary in this case to erect an expensive building, and as an extension of the lease was refused, they had to put up a handsome building on a tenure of thirty years. Upon the estates of the Duke of Westminster, he believed, tenants were generally well satisfied with the terms on which renewals were granted. The desire of the great landowners throughout England had always been to work well with their tenants, and he believed it was the same with great City companies. As an instance of the great complications which existed in London leaseholds, he referred to the case of Regent-street, where the houses, generally speaking, were mere whitened sepulchres. The buildings were such that the shop was worth as much as the whole of the house. That was produced by two causes. In the first place, the competition was such that anything like improvement by the tenants was heavily handicapped; and in the second place, the houses, being originally badly built, the ground upon which they stood was worth more than the ground and the house together, the value of the house being a minus quantity at the present moment. It seemed that here the leasehold system had reached the point of absurdity in the case of Regent-street. There was one consideration in regard to the rent of land in London which should never be left out. If the lessee required the renewal of his lease for the sake of his business, the lessor not infrequently raised the rent by selling to the man his own business. Then there was the question of the administration of the law in regard to dangerous structures by the Metropolitan Board using their surveyors as tools rather than as instruments. This had become a considerable grievance to tenants. A dangerous structure was very likely to be a house at the end of a lease, and he would ask, Was there no remedy for a tenant to compel the ground landlord to rebuild a portion of the house which was condemned? There was no remedy under the surrendering clause of the lease, and, although this might happen a week before the termination of the tenancy, the tenant must leave the house in proper habitable and tenantable repair.

Mr. John Hebb (Assistant Architect, Metropolitan Board of Works) said that this was a long question, and if there were no other arguments against the practice of leasing land than those which had been referred to by Professor Kerr, they would be sufficient to condemn it. There were also other grounds on which the system might be condemned. That it led to flimsy, unsafe, and undesirable building was to be demonstrated. Mr. Blashill had tried to show that people preferred to live in hired houses rather than in those which were their own property, and, being the custom here, it was impossible to change it. But it would be right to take the other view, and attribute the indisposition of Englishmen to remain long in one house to the fact of the tenure being insecure, and there being no inducement to put up a good building. It was the practice to put such stringent covenants into the lease that it was a breach of covenant if a man improved the building without the consent of his land-

lord. As a rule, corporate bodies had no respect for persons; they let their lands and houses to the highest bidder, and so the old lessee was in no better position than anybody else. The ecclesiastical bodies were notorious for their want of consideration for their tenants. Next to them, probably, came the corporate bodies, such as the City companies, which invariably exacted the last penny; and, being immortal, because they always existed, there was no chance of any alteration in their views. Warden succeeded warden, and they were all equally rapacious. There was no doubt that the present system of leasing land was one which could not well be defended.

Mr. Wylson remarked that there was no easier method of insuring permanent improvements than by arranging that a number of leases should fall in at the same time. That was, he believed, one of the reasons why the ground landlord sometimes refuses to renew.

Mr. Armstrong believed that London property would be improved if there were perpetual leases. The speculative builder, as soon as he got a lease granted, at once mortgaged his property. Indeed, he firmly believed that the speculative buildings of London were mortgaged for more than their value. Another important matter was, that the professional man ought to be paid by the person whose interest was looked after.

Mr. Thos. Oliver (Newcastle-on-Tyne) said in the North of England the land was entirely freehold; they lay between London and Scotland, and they had the benefit, as well as the disadvantage, of both the systems. Some of the land was held on the feu system, and a portion was on the leasehold system, as in London; but that had almost disappeared, as the prejudice was so strong against it. He had the honour to belong to the Corporation of Newcastle, and they let the land on lease on the London system, but they had so arranged it that it could be enfranchised by any person. He had other properties let on the system of perpetual ground-rents, which was never increased, and the Marquis of Londonderry and the Earl of Durham, who held property in the county of Durham, were selling land, freehold, at from twenty-five to thirty years' purchase. The Ecclesiastical Commissioners held land in Durham, and they had made arrangements by which they could enfranchise land if it were desired. The President of the Northern Architectural Association, Mr. Rich, might have been able to say a few words as to what he had done, but unfortunately he had left the room. He believed he had abandoned all other systems of leasehold in favour of perpetual leaseholds, and in his opinion that would be equal to freehold.

Mr. Mineard said that, as one of the class referred to as speculative builders, he should like to say a word from his own point of view. He found that when any one came to him about a house the first question asked was, Was there any probability of buying the freehold or commuting the ground-rent? One might build an inferior house in a locality where there was a demand, and get one's price, but one might build a palace in a bad position and lose money. If he built a house slightly better than his neighbours, and it meant 10 per cent. extra cost, he should be out of the market. The public, in purchasing a house, did not go into the details of extra cost. If a man had so much money to spend on buying a house, he would take the largest house he could get for the money or the one most convenient for his requirements. Why did not the public build for themselves? They had coats and furniture made for themselves, but in the matter of a house they did nothing of the kind. The reason was there was no probability of acquiring freehold ground, and a man who wanted a house put himself into the hands of some surveyor. If a man could go into any neighbourhood and purchase a bit of ground, even if he had to pay a smart price for it, he would probably do so, and build for himself. If a man had 1,000, or 10,000, to buy a house, would he spend that on leasehold property? If he could acquire land he would do so, and employ some of the gentlemen present to prepare plans for his house. Referring to the value of land for building purposes under the present tenure, he said he was covering land in the west of London, and had in his employ a man who knew the place years ago. He asked him what the land was worth before he took it, and the answer was 8l. per acre for market gardens. He took thirteen acres of the land, and, though he had sold some of it,

he was committed to pay 2,000l. a year. Speaking of the land tenure in Scotland, he thought if we could get perpetual leases it would be better, but it would not do away with the evils of which he complained. Referring to the difficulty of dealing with estate surveyors, he remarked that lately he wished to make an alteration in his designs, and he submitted them to the estate surveyor, who declined to accept them. They were drawn by one of the cleverest surveyor-architects he had ever met with; but the estate surveyor would not pass them. He then went to the latter and asked him if he would prepare a plan. This he declined to do. He then asked him if he might copy some of his, the surveyor's, own plans, but was not permitted to do this; and, despite his own desire, was compelled to go on building as he had begun, with stucco fronts. Alluding to a remark of a previous speaker, he said he had never written a cheque for the estate surveyor, and never, directly or indirectly, had the estate surveyor had the worth of a pencil from him. He was afraid that could not be said of all surveyors; but he was speaking of his own estate surveyor. There was very little doubt that we were surveyed enough. We had building surveyors, vestry surveyors, then freeholders' surveyors, and then, if we were unfortunate enough to have a mortgage, we had the mortgagee's surveyor, and others were called in in the event of various circumstances transpiring. He liked building; he had been brought up in it; but he would not touch speculative building if he had the opportunity to acquire land of his own in any reasonably good neighbourhood. He liked building, and he liked building well, and he thought he built a house, as a speculative builder, more expensively than by contract. He held that the present system of land tenure was bad for the public and bad for the freeholder, and he thought it would be better for both if the public could buy land with perpetuity of tenure. For one thing, it would do away with the monotony of our streets; and he thought it desirable that freeholds should be compulsory. As an inhabitant, he should build better houses if he could obtain freeholds; and he thought Mr. Broadhurst's Bill would in the main become law.

The Chairman here intimated that he had to leave the meeting, but his place would be taken by Mr. Charles Fowler, but before he left he should like to say a few words. The last speaker had made the most decided proposition, and was clearly advocating compulsory sale. Now, that would be all very well, but the object of the freeholder was to be considered as well as that of the speculative builder, and it was necessary to the owner of the land that the tribunal to decide the value should be very well considered. He was an old surveyor, his practice had been long, but local, and he had been very little out of London. He had acted for many large corporations, and though they did look after their interests, they were not illiberal, and did not grasp for the uttermost farthing. One gentleman said, when the lease had expired, that the leaseholder had no more chance than any body else. The corporate bodies with which he had been connected were always very anxious to help the lessee rather than strangers, or rather the tenant in possession, if he had any length of interest in the property. His own view was that every consideration ought to be paid to the owner of the land, although it had been said that it was the public and circumstances which created the value of the land. The same might be said of any commercial transaction, and in London building was a commercial transaction. Under existing circumstances, it was a commercial speculation. The builders took the land; they knew what they were going to do, and said so much; they would make by investing their capital and energy, and he believed they thought of very little else. They rented the land and thus avoided their buying it. They usually reckoned on making 10 per cent., and the freeholder was content with 4 per cent. or even 3 per cent. He gave them the land and charged them 3 per cent. for it, while the builder was making his 8 per cent. or 10 per cent. It was perfectly true that in almost all building transactions directly the lessee got his lease he mortgaged his property, and the system of leases in London was to the speculative builder a profitable business. The large corporations who built city offices would not build on freeholds. London freeholders had no difficulty in

collecting their rents, and a great many of the rents paid in London were just half the rack-rents, and yet no one had the slightest trouble in collecting his rents. It was for the good of the commonwealth that the freeholder should sell his freehold, he did not see why he should not do so, but many freeholders held their freeholds for the good of the commonwealth. He was not going to formulate any proposal, but he would thank Mr. Blashill for the paper he had read to them.

Mr. Fowler then took the chair.

Mr. T. H. Watson said he was in favour of the leasehold system, as it left some one who could exercise control and prevent lessees doing things which would be to the inconvenience of their neighbours and to the detriment of the locality. That was the principal defence of the leasehold system, and he very much doubted whether the public would be benefited by this Bill. He thought the freeholders might be benefited, and that it would send up the price of land. The only person who had a claim to be benefited against the freeholder was not the lessee, but the actual occupier.

Mr. Wm. Eve pointed out that if the difference between 100l. saved in purchasing leasehold and freehold was four years' purchase, that sum capitalised would in ninety-five years produce 8,000l., so that the leaseholder, if he took reasonable precautions, would leave his successors in as good a position as if he bought freehold. He was in favour of fee-farm rents in preference to leaseholds, as upon them a man could get money at 5 per cent., and a person of small capital could erect buildings, which he could not do if he had to purchase the land and erect the buildings also. It was doubtful whether freeholds were better built than leaseholds. The Ecclesiastical Commissioners made people put in thicker walls than was required by the Building Act, but in freehold building societies outside of London thinner walls were allowed to be put up.

Mr. Bateman (Birmingham) said in any mode of dealing with land, it must be a separate question whether it was suburban or town land. In Birmingham, in the heart of the town, a freeholder held a large estate, and the leases had just fallen in. The district was covered with narrow streets and alleys, and had this land been freehold instead of leasehold, they would not have had such an improvement as the freeholder had made in getting rid of those narrow streets, and building wide streets with splendid houses, containing the best buildings in the town.

Mr. Chas. Fowler (the chairman) said, having had the management of a large London estate, he spoke with some experience, and he confessed the conclusion he had come to, derived from his experience, was opposed to the Bill of Mr. Broadhurst and other similar Bills. He believed that the advantage which the leaseholder secured by the control of the ground landlord was greater than the disadvantage to which the tenant was subject. When people began to talk about tenure of land they seemed to lose their common sense and drift into all sorts of fallacies. The gentleman who said he was a speculative builder had mentioned that he should much prefer building on freehold land. He thought that gentleman was a specimen of his class with whom they were very glad to meet. He had heard of a speculative builder who purchased some freehold ground, and the first thing he did was to convert it into ground-rents, and this was in the heart of Kensington. As to the opinions held about the value of land, that was one of the fallacies people fell into when dealing with the question. The proposal that a landowner should accept the agricultural value of his land when it was originally purchased, with the knowledge or in the expectation that a town was coming to it, was what he could not understand. It was the same case as that of a merchant who bought an article seeing a rise in the market. The importance of being able to carry out improvements was an important argument in favour of leaseholds, as a very few freeholds scattered among the estate in Birmingham would have prevented the improvement being made. As to the compulsory sale of freeholds, every person was not likely to want a freehold, and he did not see why it should be made compulsory that a man should live in a freehold house. In conclusion, he thanked Mr. Blashill for bringing the various matters before them.

Mr. Blashill, in a few brief remarks, stated

that he had no intention of setting forth his own opinion, but rather to provoke discussion, and he was much obliged to the gentlemen who had given their views for responding so freely to his provocation.

In the afternoon, at 2 o'clock, there was a visit to the Royal Architectural Museum, as mentioned on page 663.

SPECIAL MEETING OF ASSOCIATES OF THE INSTITUTE.

A special meeting of the Associates of the Institute was held on Wednesday afternoon, for the purpose of discussing questions affecting the position and privileges of that class of members. Mr. Richard M. Roe, Associate, occupied the chair. There were a large number of Associates present.

The Chairman said he should endeavour to be as brief as possible in what he had to say to them, but he thought some explanation should be given as to how the meeting had been brought about. Some months ago—in last December—some few brother Associates and himself, in discussing matters connected with this Institute, were at a loss to understand the amount of apathy displayed by a large proportion of its members, especially the Associates. In seeking out the reason they came to the conclusions (1) that Associates had not sufficient opportunities of meeting one another and exchanging views, and (2) that the formal meetings of this Institute did not offer enough inducement to Associates to ensure frequent attendance, the more particularly as that class of members had little or no voice in the management of its affairs. Their deliberations resulted in the formation of a committee which has been meeting fortnightly since, and they had had many interesting discussions at those meetings. Encouraged by the unanimity evinced by its members, the Committee took one step further, and drew up a petition to the Council, praying for permission to hold a meeting there during the Conference, the idea being to obtain an expression of opinion from the general body of Associates. This meeting was the outcome. Before concluding he should like just to refer to the correspondence in the professional journals, which, doubtless, most of them had read. The writers might be roughly divided into two classes—those who had followed the line laid down by Mr. Julian, and those who advocated an entirely fresh departure, namely, a new society. He felt it his duty on behalf of the promoters of the meeting to disavow all sympathy with any movement tending to undermine the Institute. The duty of members of the Institute was to support it loyally. They were the fundamental props of the Institute; they were the foundation. He would not detain them any further, except to say that now it rested with them to approve or to deprecate the efforts which had been made on their behalf, and he would now call upon the hon. secretary to read the first resolution.

The hon. secretary, Mr. Julian, then read the first resolution, which was as follows:—

"That in the opinion of this meeting the Royal Institute of British Architects, just completing its fiftieth year, should become more generally representative of the profession."

Mr. Woodward, in moving the above resolution, said,—I have thought that it would be well to first acquaint myself as to the position occupied by members of other institutions and chartered societies, as that might influence an opinion as to the steps which might be taken to bring this Institute into harmony with the existing requirements of all its members. I have perused the charters and by-laws of the Geological Society, Royal Society of Musicians, Royal Colonial Institute, Royal Astronomical Society, Royal Institution of Great Britain, Royal Geographical Society, Institute of Actuaries, Society of Civil and Mechanical Engineers, Institution of Mechanical Engineers, Society of Engineers, the Institution of Civil Engineers, the Surveyors' Institution, the New York Chapter of the American Institute of Architects, and last, but not least, today, the charter of the Royal Institute of British Architects. Now I have not read those charters and by-laws with any idea of instituting comparisons between them and our own charter, for or against the R.I.B.A. To that Institute I am sure we are all loyal; we are not, I venture to say, among those who, belonging to that body, could now desert it for "fresh fields and

pastures new," nor those who, being debarred for various reasons from now entering within its portals, would erect,—perhaps upon a foundation of sand,—an edifice whose doors would probably be shut to few, but wherein the traditions of half a century of unique architectural representation would be lost;—wherein would have to be created substitutes for the shades of Barry, Basevi, Gwilt, Cresy, Blore, Burton, Smirke, Papworth, Hardwick, Cockerell, Pennethorne, &c., and, I am happy to add, not a shade, but a substance, for a Donaldson,—the only survivor of the little band of architects who met on the 18th of May, 1834, at Mr. Rainy's rooms, 14, Regent-street, to form the society or institute which now counts 1,273 members of all classes within its pale. I observe with regard to the charters which I have read that there is an evident intention of conferring a share in the representation upon what I may term the professional element of the various societies, and that the Surveyors' Institution, which now numbers about 1,150 members,—and which is, perhaps, more than any other of the societies, a kindred one with our own,—that it has risen to the feelings and wants of the present rising professional element, and that it has, perhaps, as far as may be, made itself generally representative of the profession; and that brings us to the consideration of my resolution, that our Institute should become more generally representative of the profession, and we shall have before us three points:—1. Whether the Institute does generally represent the profession; and if not, in what way it does not? 2. Whether it could, if it so desired, be further representative of the profession? 3. In what manner it can become so further representative of the profession? As regards the first question, I take it that the origin of this meeting is a feeling that the Institute does not so generally represent the profession, because a very considerable section of it,—because 682 members, contributing an annual sum of over 1,400l. to its revenue,—are not represented in the body having the control of the expenditure of that money, and because they have not the means by which they could regulate in any manner the election of the men who have the management in the expenditure of that money, and because of other reasons upon which I will not now touch, but which will no doubt be fully discussed by the speakers who will follow me. My second point is, in what manner the Institute could, if it so desired, be further representative of the profession; and we at once arrive at the strong reason which has been so constantly urged, that the Charter forbids that which would make the Associates satisfied. But even this point has now, I venture to think, been converted from the impossible into the improbable. Mr. Cates's speech the other evening in this room, although it did not in any manner bind the President or the other members of the Council, certainly did not convey the idea that any proposed alteration of the Charter would be nipped in the bud, or crushed when it had begun to blossom, and, I was about to say, had almost borne fruit in the meeting here this afternoon. Now, I at once confess that in reading through the charters I have named, I have only observed one which has been altered since its first settlement; but that one is for our purpose as good as a dozen, and therefore we shall be relieved of some anxiety by bearing in mind that the charter of the Royal Institution of Great Britain, established in the year 1800, was altered by an Act of Parliament, "for enlarging the powers granted, and for extending and more effectually promoting the objects thereof"—50 Geo. III., cap. 51 (local and personal), 18th April, 1810. I must further remark that in no charter have I read such words as those to my mind unnecessarily severe, unnecessarily involving unrepresentative results, as those concerning the Associate, viz., "that he shall not have any right to vote or otherwise to interfere in the regulation of the affairs of the said society." Those words were inserted when the Institute consisted of about 100 members of all classes,—when it was more a quasi-dilettanti society, and not a body of 1,273 practical working men. It is these words, gentlemen, for the consideration and discussion of which we are assembled. I will there leave this part of the subject, with the simple expression of my own opinion that, if it so desires, the R.I.B.A. can become more generally representative of the profession.

The third question,—In what manner can it become so representative of the profession?—is one which is essentially for the expression of opinion of this meeting; but I cannot help saying that which is often put before me, that the meetings at the R.I.B.A. compare unfavourably with those of the Surveyors' Institution. I am a member of the latter body, and certainly the papers and discussions which take place there are of the highest order. But surely this cannot be laid to the R.I.B.A. Council or President. If men will not, or cannot, write good papers and properly discuss them, all the Presidents and Councils in the world cannot make them; but it is to be very much regretted that when such men as Mr. Arthur Cates take the trouble to prepare a paper so teeming with important matter and points deserving of discussion as that which he read in this room last evening, there should be an entire absence of men able to take up the discussion of such subjects, and that the discussion should wander into the thrice doubly-thrashed subject of provincial architects taking out their own quantities. Who can wonder if unfavourable comparisons are made when such an opportunity for raising the standard of our meetings was so completely lost? However, I am wandering somewhat from the immediate subject before the meeting, and beg to conclude by moving the resolution which has been read by Mr. Julian.

Mr. Hugh McLachlan said that he had much pleasure in seconding the resolution. He did not propose to go into such slight details as Mr. Woodward had done, but he was going to cover rather a wider area. The question he should start with was this, Why was the Institute not more representative? The first and, he believed, the most important reason of the whole was, because such a large number of architects, not only in the country but also in this metropolis, stood out from the Institute, and appeared to think that they could manage their own affairs better than having any ruling body to guide them. That, he thought, generally meant that all of them were ready to out against one another, and that sort of thing was marked pretty well by a little notice in the papers. In last week's *Builder* there was an advertisement for a competition for some Board School in Wales, and no premium was offered; and he found this clause, "Intending competitors must state upon what terms they will carry out the plans, and superintend the works, and also give estimates of such of the proposed buildings." That was, first they expected to get a large amount of work done by a large body of architects for nothing whatever, and, in the next place, for the full carrying out of the work, they expected to get it done at a considerable discount. That was not creditable to architects, but it was no fault of the Institute or of the Council. Besides those large numbers who had been invited to compete by the advertisement in the *Builder* and by friends outside the Institute, there were plenty of others within the Institute who were ready to find fault with the Council and to criticise, and at the same time never put their shoulders to the wheel to bring forward any matter that was a way to tend to improvement. And, thirdly, he thought it must be owing to the fact that, in a certain degree, the Institute was a kind of somewhat private select club. There were some who went to the meetings, and knew one another, and shook hands, and spoke together, and discussed papers, but it was certain that the vast majority of the members kept away. That was the case of late years, and occasionally it would be seen that this meeting-room was pretty well as full as it was at the present time. But he thought it was quite certain that those who had been there on many occasions knew that for a meeting of members of the Institute, it was rather too select a meeting. At the election of Mr. Street, there was a great break out of popular excitement in the Institute, and it was thought reformation would come forward in that way. That unfortunately was not the case. The Council were, however, readily disposed to help the committee. They had heard, not only from outside the Institute, but from those who had been working in this little affair, that the Council itself had proposed to revise the Charter. That was a step in the right direction. Mr. Whichcote, in the first week in this year, in the *Builder*, had a very important letter, and he would like to read the conclusion of it to the meeting. In one point he speaks of the architectural profession having no architectural representative. This was unfortunate. There was one architect in Parliament, but he

very evidently was not a representative man. With regard to the remarks in Mr. Whichcord's letter to the *Builder*, the conclusion read thus:—

"The First Commissioner of Works, by an anomalous compromise between the principles of Free Trade and Protection, is really at the head of a huge architectural office, engaged in erecting all over the kingdom a number of public edifices, and entrusted with the alteration of royal palaces, Government offices, the British Museum, and similar buildings; and openly competing, by word and deed, with professional architects. For the moment all the youth and promise of the profession is deeply engaged in a speculative competition, invited by the Government, the first stage of which is to be secretly adjudicated on, under the direction of the chief of this very office, who will thus be judge and party in an identical cause, and who will appoint his own jury. In the second stage, ten professional architects, who, for a consideration, present to her Majesty's Office of Works ten carefully-finished and complete designs for a large building, in the hope that 'at least one architect' among the jury will at least recommend one architect among the ten competitors to superintend the execution of the work. Should events prove unfavourable, as they have more than once turned out before, there is only one body in the kingdom who can help British Architects, and that is the Royal Institute. The Royal Academy, even if it had the will, cannot help either sculptors or architects. At the present time it is a body of painters. Out of forty-one Academicians, only two are architects, neither of whom has taken the post, hereditary to our calling, of Treasurer, who, for the first time since the foundation, is a painter. Of the thirty Associates, only two are architects. Of the Academician-professors, only one chair, that of Painting, is filled; the chairs of Sculpture and Architecture, one unoccupied for three, the other for two, years, are both vacant. Only the Royal Institute of British Architects can help the profession, and, aided by an enlightened professional press, it can do much. I would say, therefore, to the architects all over the country,—Organise, Organise, but not against each other. Organise gentlemen and colleagues, for the general good, and in the common defence."

Those words of Mr. Whichcord were very important and very true. Unless architects outside the Institute joined the general body it would still be very weak. It was far better there should be some more unity among them, than they should do their duty to their clients and be properly paid for it. With regard to the charter, it had kept several matters back, which he (the speaker) pointed out in the letter he wrote to the *Builder* a month back. Another question has come up where the charter has stood in the way of the question of the election of Fellows from the general body of Associates; but perhaps it would be wise not to say anything more about that. With regard to the country architects, he thought it would be a good thing if every country architect fitted to be a member of the Institute were a member of one of the provincial societies, and if those provincial societies were connected with the Institute, and sent a representative to it on the Council, subscribed towards the general society, and so had something carried out like that which he believed there was in America, in the Chapters of the Society of Architects. That would tend to make the Institute more representative. He thought on the whole it would be well that the Institute should hold the same position towards other architectural societies that the mother-country held towards her colonies—that they should be federated in this Institute, and ready to work with it if required. He had much pleasure in seconding the resolution.

The resolution was then put, and carried unanimously without further discussion.

Mr. Julian (who was received with loud cheers) said that, with their permission, he would now move the following resolution:

"That in furtherance of the foregoing resolution it is desirable that some voting power should be conferred upon the class of Associates."

He ventured to suggest that this resolution followed as a matter of necessity upon the one just passed. If this meeting considered that it was desirable that the Institute should be more generally representative of the whole profession, the first step in that direction must be for the governing body of the Institute to be more representative of the whole body of members. How was that to be done? Only by giving voting power to the Associates. It was only by that means that the body itself could become a more representative body. It was an extension of the franchise. They lived in an age of extended and extending franchise. The air was full of extension of the franchise,—and he meant to introduce a little of the free air into that building to disperse a few of those musty vapours that had now been accumulating for fifty years. They sometimes were met with the rejoinder,—“What good will it do you if you get a vote?” He observed that question was generally put by gentlemen who were already in possession of the

vote. Let them endeavour for one moment to realise the feelings of the Associate who attended a meeting there, taking a great interest in the subject under discussion, assisting possibly in the argument, and then, when the point was to be settled by a vote, he was met by the cry, “Fellows only!” The fact was, in a few words, that the right to assist in the settlement of a question by the exercise of a vote, although apparently a small thing, marked the difference between being an ornamental appendage of the society, and an actual working member of the corporate body. The Associates were not corporate members of the Institute. They were merely attached to it in the same way as honorary Associates and amateurs were. What right had the Associates to ask for the voting power? The share of the funds contributed by the Associates of the Institute was over 46 per cent., and it was now a pretty universally recognised principle that the contribution of revenue should be accompanied by some voice in the expenditure of the revenue. They could not be met either with the objection that some people meet the proposal to extend the franchise to agricultural labourers. They were all, if not absolutely on a level in the Institute,—they were all supposed to be, at any rate, educated gentlemen, and capable of forming a judgment on most of the questions that were submitted to them. Another objection that he had heard raised to this proposal was that the Institute was the Royal Institute of British Architects, not the Institute of British Architects' Assistants! That was to assume that all Associates were assistants, which was a very long way from the fact. He should like to point out to those gentlemen who made that suggestion that there were assistants and assistants. That there were assistants who were in every respect qualified architects, and who did most valuable work for the principals whom they assisted. He knew that there were other assistants who were mere hewers of wood and drawers of water—“neat tracers,” and so on. But they did not find those assistants in the Institute. He thought he might safely assert that the success of their movement, so far, was shown in a few words he should like to read from the remarks made by Mr. Arthur Cates at the last ordinary meeting:—

“The whole scheme of these by-laws should be again considered with reference to the advanced position of the profession and the Institute, and to the changed relations of the several classes of members towards each other. I may say that, as regards one point to which Professor Kerr alluded,—the demand of Associates for a share in the management,—the Council have afforded Associates an opportunity of expressing their opinion by setting aside one afternoon during the week of the conference for assembling in this room, during which time they may discuss all matters in which they are interested in relation to the Institute. I look forward to that meeting as being the first solid step towards that which Professor Kerr has suggested as desirable, and that is the bringing of this Institute (if it is not already so) into harmony with the present requirements of the profession, and it will permit me to suggest it, in the place of now appointing a committee, or suggesting a committee, to consider the matters he has referred, it would be better if we were to propose to refer to the Council the reconsideration of the charter.”

He should like to say a word or two as to the manner of working for this. He should deprecate any carping tone. It was said by a Fellow of the Institute that it was of no use approaching the Council. The fact that they were meeting them to-day showed that was not the fact. It was his privilege to wait upon a Fellow to ask him to present a memorial to the Council for permission to use the room to-day. The time was very short, but he gave all the assistance in his power to strain a point, and sent him (Mr. Julian) to the secretary, and everything was done that could possibly be done to give them this meeting in the Conference week. Therefore he thought it was very undesirable to adopt the idea that it was of no good to go to the Council. Another objection that had been raised to giving them a vote was, what inducement would there be to men to become Fellows? He thought the way to induce men to become Fellows of the Institute was to make Fellowship an honour. He did not think fellowship would become an honour by attempting to drive Associates into the Fellowship. It would be better done by allowing people to feel that those only were elected Fellows who had attained to some eminence in their profession. They heard accusations of apathy against the Associates, but he did not see what else they could expect when they thought of their position, and when they sat there without the right to vote. He had with him the Charter of the Institution of Civil Engineers, which showed

that Associates were entitled to the privilege of voting, &c. Not only that, but he found that Associate Members of the Institution of Civil Engineers—that were professional engineers—had the right to vote, and they also had a right to be elected on the Council. The same held good in the Surveyors' Institution, and they went further therein, and gave their non-professional Associates a vote. This was an important resolution, and he thought it well, as he had heard in the course of the steps he had had to take in arranging for this meeting a great many objections raised, to meet these questions one by one, to state, not only why they asked for more voice, but endeavour to prove that the objections raised outside could easily be disposed of. He believed if that resolution was passed, and if the consequence of it and of other resolutions was that voting power was given to the Associates of the Institute, that the tendency of the reform would be to promote the interests of the Institute and the interests of the profession. It would do so by popularising the Institute among architects, and he believed if any of their young members were spared fifty years to see its centenary they would look back on this movement and see that it had been a sound and healthy one.

Mr. J. Osborne Smith said that the resolution just moved seemed to him so eminently satisfactory and reasonable that it appeared almost a matter of form to second it, and still more a matter of form to say much after Mr. Julian's speech in recommendation of the proposal. At the same time, there were one or two thoughts that had occurred to him that he should like to state. In the first place it seemed to him that they should regard this question from a point of view, first, as to whether they were strictly entitled to the vote—whether it was right and proper that they should have a vote. The Associates constituted seven members out of every eleven, and they had been content hitherto that the society should be regulated by the other four. That did not seem right or reasonable. It did not seem reasonable to expect gentlemen to join a society to be governed by a minority, and so small a minority. At the present moment there were 409 Fellows and 691 Associates that was putting aside Honorary Associates, who were out of the question in this matter. Consequently the Fellows and Associates stood as 4 to 7. Four was not what was termed a good working majority. What they wanted to have in the Institute was a good working majority. Great complaint had been made of the Council being a select body, and all that sort of thing, but what he felt was that the Fellows were to blame for that. Give the Associates a vote and they would clear the atmosphere a bit, as Mr. Julian had said. What they wanted was to be placed in a position that they might not be told from the Chairman, as they had been told recently, that they were irregularly interrupting legitimate business. About twelve months ago the Chairman refused to put a motion because it was moved and seconded by an Associate, but subsequently, when it was put, it was not entered on the minutes, and when they asked how that was, no direct answer could be obtained, but they were told they were irregularly interrupting legitimate business. That was not the way to talk to a majority of 7 to 4. He supposed that they would all admit it was right in principle—that the principle was correct that they ought to have a vote. He took it they were all agreed upon that. (Cries of “Yes.”) The next question was, Was it expedient for them to have it? They were very often told that it was not expedient just now, but that it was all right,—they should have it. Now was it desirable at the present time for the good government of this Institute that they, as Associates, should have a vote or not? (Cries of “Yes.”) Was it expedient to give it? He thought it was, and he thought they would say by their vote this afternoon that they thought so. The next question was, How was it to be done? They said it would cost an Act of Parliament. They had a Charter, and that Charter said they must not interfere with it at all. In order to alter that they would have to get another Act of Parliament. That was a serious thing. But they had a very prominent member of the Council suggesting that they would have to get an Act of Parliament for something, so they might get it for this. That difficulty was soon got over. There was an old proverb, “Where there's a will there's a way,” and if they could only get the Fellows,—because they

were the people they must appeal to,—to take it up, the Council would do whatever the Fellows told them to do. They wanted to get the Fellows to see it was to the interest of the society that Associates should have a vote. He thought it was desirable this thing should be ventilated with the Fellows; and what they wanted to do was to convert the Fellows to their way of looking at the point, and to let them feel that the Associates had an interest in the Society as much as any of them. It was a very objectionable thing to be told they were interfering. They supposed themselves to be members of a society, and to be told when they made an observation that they were irregularly interrupting the business of the meeting he confessed that word did stick in his throat. There was no doubt the thing could be done. They were agreed that the thing was right; next, that it was expedient, and they would find out the way to have it done. It rested now entirely with the Associates whether they would have a voice or not; whether they would continue to be silent members. He had much pleasure in seconding the resolution.

Mr. J. B. Gass (Bolton) said that when the air was clear the country Associates should be taken into consideration. At present they paid their subscriptions and their entrance fees; they received the "Proceedings" of the Institute and a voting paper, which they had not to fill up. He felt that the country Associates should have some voice in the election of the Council. If this Institute was to become representative of the profession out of London, the disdain of the quantity business must be dropped altogether. It was a question of living or starving in the provinces. They could not carry on their business without they took out the quantities. He should like it to be added to this resolution that any recommendation for voting power to the Associates should include some provision for giving voting power to the country Associates. He also suggested that the quantity question should be taken into consideration.

The chairman said perhaps Mr. Gass would be satisfied to leave the matter to the Committee. Let them get the vote first. Everything rested upon getting the vote. Country Fellows did not vote unless they were present.

Mr. M. B. Adams thought the last speaker touched the whole subject, because they must not approach this subject with anything like the idea of limiting the question to those who practised in London. Then, as to the quantity question, that was, no doubt, a serious matter, and one which, sooner or later, the Institute would have to drop. It was a legitimate thing that a man should be allowed to take out his own quantities. Professor Kerr had said that by hook or by crook, charter or no charter, if this Society was to be what it represented itself to be—representative of the whole country—they must have a vote, and he agreed with him. If they were to secure that which they were now seeking it must be at the hands of the main body of Fellows. He thought it was time for them to say that as they paid 46 per cent. of the income of the Society, they must, with as short a delay as possible, have a vote which they certainly had a right to. Let junior as well as senior members have a right to speak, and then they would flock up to the meetings. Let them manage their own affairs and listen to their own members, and make themselves worthy of the attention of such men as Mr. Butterfield and Mr. Street, and let their object and aim be the progress of themselves, and, therefore, the progress of others.

Mr. Elkington thought the reason that Associates were, in the first instance, deprived of a vote, was because it was not certain who might become Associates. But a good deal of that had changed, and without themselves being officially consulted, an Examination had been put upon them. Those who were now coming into their ranks were especially qualified to take part in the business of the Institute. There should, for the good of the society, be a constant flow from the rank of Associates to that of Fellows. There could be no doubt that one way of qualifying them to become Fellows was to encourage them to take part in the meetings as Associates. He echoed what had already been said by other speakers, and he felt much diffidence in coming to the meetings.

Mr. Blagrove said that in establishing a Compulsory Examination without consulting the Associates in any way, the Council had increased the difficulties in the way of one's becoming a member. It would, therefore, be only

reasonable to increase the advantages of membership, as the outcome of that policy. As to the question of quantities, that had better be kept a little in abeyance at present. He supported the resolution.

The resolution was then carried unanimously. Mr. H. H. Langston, in moving the next resolution, said that he felt, upon their approaching the Council and Fellows of the Institute with a memorial distinctly setting forth the object they had in view, that they could confidently look forward to their prayer receiving a generous response. The Charter was entirely unfit to cope with the present exigencies of the day. What better time than the Jubilee Year to draw out the crumbling and decayed prejudices, and to insert the corner-stone of Associates' rights? They had a larger welfare in their present than those gentlemen of the upper rank, and consequently it was their duty to their art and to the public to demand that they should be there. He submitted that such a state of affairs as existed spoke to thinking men as a monstrous absurdity; but while he was hopeful that the Memorial would be met with a sense of justice and fair play, he felt that the Institute would never become representative of the profession until it had learned to live with the times, and to appreciate the vitality which was waiting to be cast into it by the great body of Associates. He concluded by moving the following resolution:—

"That the Council and Fellows of this Institute be memorialised to consider the best means of revising the Charter and By-laws to give effect to the wishes of this meeting as expressed by the resolutions."

Mr. Sydney Young said that he had much pleasure in seconding the resolution. He was glad to see so many Associates present, and to find they were so unanimous, and he trusted that the meeting would show by the hearty and unanimous way in which they would pass those resolutions that they were all thoroughly agreed upon the matter, and that the Council would take it into consideration and give it due effect. He thought the Council would see in the numerous attendance there that day, and the earnest way in which the speakers present had spoken on the subject, that they had a case for them which demanded their attention and consideration at their hands. He would conclude by seconding the resolution.

The Chairman intimated that the memorial would be prepared by the committee and signed by the Associates.

The resolution was then agreed to unanimously.

Mr. Blagrove moved the following resolution:—

"That a committee, not exceeding 21 members, be appointed by this meeting to carry out the objects of the foregoing resolutions."

Mr. G. A. Pryce Curzon seconded the resolution, which was unanimously carried.

Some considerable discussion then ensued as to what form the resolution appointing the committee should take, in which Mr. Woodward, Mr. M. B. Adams, Mr. Stannus, Mr. G. Prynce, Mr. Reeves, Mr. J. A. Smith, Mr. Muody, Mr. Monson, Mr. Julian, Mr. Riddett, Mr. H. W. Pratt, Mr. McLachlan, Mr. Inskip, and Mr. M. H. Judge took part. Eventually it was agreed that the following resolution, moved by Mr. Hardcastle, should be adopted:—

"That a committee of the following gentlemen:—Richard M. Roe (Chairman), William Woodward (Vice-Chairman), G. Richards Julian, Hugh McLachlan, H. Hardwicke Langston, Sydney Young, Geo. H. Blagrove, Henry P. Monckton, James Osborne Smith, E. Early Hollis, Joseph F. Power, John Malcolm, Thos. E. Mundy, G. A. P. Curzon, with power to add to their number up to and not exceeding 21, be appointed to prepare and present the memorial, and to take such further steps as may be necessary; and seven of them to form a quorum."

To this resolution the following rider was added:—

"That the committee appointed report to a future meeting of the Associates, as soon as a reply has been received from the Council of the Institute, the purpose of considering such reply, and the appointment of a standing committee, if necessary, to look after the interests of the Associates."

Mr. John B. Gass (Bolton) then moved:—

"That this meeting believes that if the Charter be altered, powers ought to be given to country members to vote by letter or otherwise, and in the interest of those members the question of the payment for quantities should be taken into consideration."

Mr. Stannus seconded the motion. Some discussion ensued upon this resolution, and eventually

Mr. Hardcastle moved "The previous question," and this was carried by a large majority. The Chairman then moved "That the thanks

of this meeting be given to the Council of the Institute for granting the use of the room for the meeting." All of the Committee, he said, were impressed with the way in which they had been met, and the success of their project had been, in a great measure, due to Mr. Cates's influence. This was seconded by Mr. J. Malcolm and carried by acclamation.

On the motion of Mr. Langston, seconded by Mr. S. Young, votes of thanks were unanimously passed to the Chairman, and to the Hon. Secretaries, Messrs. Julian and C. F. Murray, and the proceedings terminated.

STREET, BURGESS, AND VIOLET-LE-DUC.

THERE was a very large attendance at the Wednesday evening meeting to hear the papers which had been announced to be read, viz.:—1, "George Edmund Street," by the Right Hon. A. J. B. Baresford Hope; 2, "The Works of the late W. Burgess, A.R.A.," by Mr. George Aitchison, A.R.A.; 3, on "Violet-le-Duc as Architect and Art Historian," by Mr. Charles Wethered.

Mr. Ewan Christian, the newly-elected President of the Institute, occupied the chair, and, in opening the proceedings, announced that a letter had been received from the Right Hon. A. J. B. Baresford Hope, M.P., expressing regret at being unable to attend in person to discharge the duty of reading the paper which stood in his name—a duty which he considered alike a great honour and a great pleasure. Mr. Blomfield had, however, kindly undertaken to read the paper for him. Mr. John Holden wrote that in consequence of the death of his brother, Mr. Isaac Holden, he could not be present; and a letter had also been received from M. Ch. Questel, President of the Société Centrale des Architectes de Paris, to the effect that at the age of 77, he did not feel equal to the task of crossing the Channel, but he hoped to see them at the Paris Conference.

Mr. A. W. Blomfield, M.A., then read Mr. Baresford Hope's paper, which was as follows:—

GEORGE EDMUND STREET.

THE notable feature of the distinguished life which I am called upon to commemorate was its harmonious, calm progressiveness. No lurid glare of romantic adventure lighted up or obscured the career of George Edmund Street; no feverish throw for the last stake, despair and ruin shaking the dice against success and honour, is there to tempt us to revel in the fallacious indulgence of word-painting. No dreary periods of obscurity gave savage delight to unexpected bursts of hot prosperity. Ups and downs, of course, there were, success in this competition and disappointment in that one; carping criticism, and all other such episodes of rainy weather and storms which freshen the atmosphere of public life, and upon which it is the duty of every one to reckon who makes his choice for a public position. But in his professional career, which is all with which I am here concerned, Street's life was eminently one of a prosperity deserved, fought for, and achieved by a rare combination of industry, realised duty, buoyancy, will, and genius, in alliance with those gifts of manual dexterity in sketching so useful to the architect who has always to be making himself understood by that Philistine public to whom elevations are masks not faces, plans deliberate frauds, sections aimless trifling.

The pupil of Owen Carter, of Winchester, in 1841, and then, in 1845, of George Gilbert Scott, Mr. Street found himself in 1849, and at the age of twenty-five, an architect with his own way before him to carve out, and so he carved away for every day of two-and-thirty years, till, after he had passed through the portal of the Royal Academy, that way ended in Westminster Abbey, where a funeral, only not a State one in the technical sense of the word, conducted to his grave the President of the Institute of British Architects and artist of the grand pile of National Law Courts. He began, as I said, to practise in 1849, at Wantage; in 1852 he went to Oxford, having been named Diocesan Architect by Bishop Wilberforce; and in 1856 transferred himself to London, which he never left,—so nobly simple was his career, which would hardly have been possible except in some great centre of life. It owed none of its success to dexterous compliance with popular tastes. Perhaps in his younger days our friend was a little too fond of emphasising his independence. Street was a man of twofold convictions,—a

Gothicist and a religious architect, as the Church of England teaches religion. Here let me for a moment forget that I have for my audience the Conference of Architects, and travel back in memory to some far-off meeting of ecclesiologists, at one of which I had the great privilege of making Street's acquaintance. As an ecclesiologist among ecclesiologists, I claim for Street,—and not for Street alone, but for the owners of other cherished and honoured names, some still with us, and others resting from their labours,—the credit of a rare example of truthful conviction, consistently acted out in the engagements of a lifelong career. I do not intend the slightest reflection on another theory of the architectural life; I honour the other conception of the architect's mission, that of subordinating personal predilections to the wants of the client, always with the reserve, of course, that the construction shall be good, and the design not ludicrous. The world could not go on without the existence of such an understanding. Indeed, the power of accommodating personal faith,—faith, I mean, in things terrestrial no less than celestial,—with professional want of prejudice, without forfeiture of self-respect, makes the world richer in its store of moral treasure. But yet I must be allowed to reserve peculiar personal admiration for the architect whose life of art is one long fearless creed, and who refuses to win fame or profit by ways adverse to the propagation of what he believes the highest truth. Architects of this type have been eminently the growth of England, and of the English Church of this century. Eminently,—I say no more when I think of Pugin, to mention but one name. The ecclesiological promise of France seemed as bright as ours forty years ago. It has been interred in chill silence at the civil funeral of Viollet-le-Duc, while from the graves of Scott and Street at Westminster the voice of sure and certain hope rises that our mission shall go on and prosper.

But let me not stray into controversial by-ways. I could not refrain from these words without leaving my picture of Street incomplete. To say more might be needlessly to raise debate. The man for whom I have claimed this merit was no pale, spiritless dweller among the tombs, but, up to all but the last day, a stalwart Englishman of vigorous vitality, robust constitution, unflagging spirits, beaming with the beauty of healthful activity, awake to the calls of that life in which personal capacity ministers to public prosperity. Let us briefly travel over the list of some of his principal works, after which I may offer a few remarks on the lessons which they teach. I dare not open the multitudinous roll of churches which have passed under his restoring but reverent hands with no detriment, except, it may be, in those early days when all were learners together. It is enough to name some principal works, such as the south transept of York Minster, Carlisle Cathedral, Kildare Cathedral, St. Canice Cathedral at Kilkenny, the noble churches of St. Peter Mancroft at Norwich, Clun, Welshpool, and Hythe. The recasting of Christchurch Cathedral, Dublin, and, still more emphatically, the nave of Bristol Cathedral, are works in which the original element is too large quite to justify us in calling them "restorations"; nevertheless no other more appropriate word occurs. Of new churches due entirely to Street's inventive genius the earliest which calls for notice is St. James the Less, Westminster. All Saints', Boyn Hill, Maidenhead, with the adjacent block of almshouses, soon followed; then All Saints', Clifton, noteworthy for its noble span. Then come St. Mary Magdalene, Paddington; St. Philip and St. James, Oxford; St. John's, Torquay; and, of a later date, Kingstone, Dorset; a series of churches in the East Riding of Yorkshire for Sir Tatton Sykes; St. Saviour's, Eastbourne; St. Margaret's, Liverpool; St. John the Divine, Kensington; the Garrison Chapel, Portsmouth; with the chapel at Duncuch; and his own particular church, St. Mary, Holmbury, near the beautiful retreat which he had built for himself. Abroad, Mr. Street constructed the Memorial Church at Constantinople; the American and the rising English churches at Rome; and he designed the American Church at Paris. Such are, perhaps, his most conspicuous churches; while there are two cathedrals, which only exist on paper. The beautiful design, which won the second prize at the international competition at Lille in 1856 is well known,—better, probably, than design for Edinburgh Cathedral, completed

in 1872, which I have no hesitation in saying seemed to me of the highest merit; while, perhaps, its distinguishing qualities were those which caused it to be rejected, namely, its modesty and its scrupulous adherence to the stipulated price. Mr. Street with much reason grasped that smaller ideal of cathedral which is found in those parts of these islands which are not England, as at Kilkenny, Llandaff, and Dunblane, and reproduced it under conditions which left the building every inch a cathedral. However, a less original rendering, of the usual English type, was preferred.

I must now note two works which do not not quite fall under restorations or new churches. First comes an effort of great ability and courage, the recasting of the interior of the dreary Guards' Chapel, which stands up like a starveling Greek Temple in Birdcage Walk. The problem was to transfigure the inside while he was bound to leave the exterior in all its old hideousness. So there it now stands, all glorious within, full of thoughtful artistic beauty,—a church admirably adapted for Anglican worship, displaying loving care in every detail. Gothic would have jarred too harshly with the inevitable outside, so Street worked in a style in which Romanesque, referring backward even to San Clemente, is handled with an originality and an avoidance of anachronism which makes it incontestably appropriate to its age, its country, and its peculiar use.

The other speciality of which I may speak is the storied reredos (containing Redfern's masterpieces of sculptured groups), which, together with Pugin's window, fills the east end of St. Andrew's Church, Wells-street.

Of religious buildings not churches, his earliest was the Theological College, Cuddesdon,—very picturesque, but no doubt too crowded. Later, and of broader design, comes St. Margaret's Convent, East Grinstead; while of works purely secular, let me first name the design which won a prize more than a quarter of a century back in the competition for the Foreign and War Offices. Duncuch House, Aberdeenshire, is highly spoken of, and a Gothic house in Cadogan-square does noble battle with the envying phalanx of Queen Anne conceptions. I pass over various parsonages and schools. Mr. Street's own house on the flank of Holmbury, Surrey, shows a masterful handling of the homely picturesque of the Tudor phase of our old national style. In another competition, the limited one for the National Gallery, Mr. Street was not successful, and truth compels me, as one of the judges there, to say that I do not think his design was one of his happiest inspirations. But a far more important competition was proceeding at the same time, the one for the Courts of Justice, and it is best to sum up this momentous chapter in the history of national architecture by saying that it has enriched this generation and this city with Street's great masterpiece in the Strand,—a masterpiece of which we may be well proud, in spite of the mutilations to which it was subjected by official ignorance and parsimony.

I will not weary you with any longer list of those beautiful works sown broadcast over the land, in every place, so to speak, except, I grieve to say, Cambridge; but I turn to Street's literary work. I shall not attempt even to epitomise the long schedule of articles, papers, lectures, reports, and pamphlets which dropped from his pen, winding up with that noble legacy, his very last effort of active intellect, the presidential address at the Royal Institute of British Architects, of November, 1881. Street has endowed architectural literature with two books. "Brick and Marble in Italy" first appeared in 1855, and bears its author's name, generally known. A second and enlarged edition appeared at a much later date. The second work is "Gothic Architecture in Spain," which taught the superficial traveller that he had but touched the fringe of Spanish Medieval architecture by visiting Burgos, Toledo, and Seville, if he left Santiago, Gerona, and many other noble minsters unvisited. Spain in Street's hands was no longer a Renaissance country with Medieval exceptions, but as truly Gothic a country as England, France, or Germany, and with closer affinities to them in style than Italy.

What are the lessons which we can draw for our benefit from this long record of prodigious brain activity? There are many, both artistic and moral and there is one in particular which

partakes of both natures, and which admits of concise statement,—I mean the openness to conviction, the independence of mind, and the absence of false pride which led Mr. Street to change his style when he saw reasons to believe that he was marching along the wrong road. The pupil of Scott and the child of the Ecclesiological Society, he started in life with principles of the more rigidly English orthodoxy. But he was actively and rapidly receptive, and his Italian tour wrought a great change in his views, and he returned full of the adaptability to home wants of many seductive features of Italian Gothic,—cornices, plate tracery, brick and marble interchanged, and so forth. Of this influence St. James-the-Less, Westminster, is a notable instance, and signs of it are found in his offer for the Public Offices, in Cuddesdon College, and in Boyn Hill Church. Many architects followed in his wake, and the success of Italian Gothic seemed secured,—not as an interesting and fruitful object of study,—that it always must continue till taste and research are hissed off the stage,—but as a style desirable to be used in England in conscious preference to the traditional native forms. Though the building is not by Mr. Street, I may point to the Scientific Museum at Oxford as the climax of this phase of taste. Few as are by comparison the years which have gone since this building was hailed as an architectural revelation, they are nearly as remote as the days of Chambers and the Adam family,—perhaps more so. By-and-by Street's candid mind and clear intellect realised that workaday Italian Gothic was for England a caprice, and he bravely returned to the purity and elasticity of the Edwardian style, only retaining, as he had a full right to do, the greater variety of materials in marble and brick and mosaic which modern commerce and processes had made available, and which could be developed on the lines of English composition with as much truth as upon those of a foreign style.

For a man to change once is not so uncommon, and the action may either show wisdom or the reverse, or simply come of unconscious drifting. But for a man to retrace his course after such a change, is either instability or heroism, and Street's practical retraction of that propagandism of Italian Gothic in which he had shown himself so personally successful partakes of the latter quality. Such changes might be comparatively easy with the architect who is personally above detail, or who, in other words, is too lazy or too busy to attend to the minutiae of his own buildings. Street was none of these. He felt profoundly that the whole was made up of its parts, that ensemble and detail helped each other; while bad, coarse detail might blur the merit of that which in the rough had been a powerful conception. So with cheerful, unremitting toil he laboured away, not merely at mouldings and foliage, and so forth, but at furniture, fittings, and all accessories, ornamental or practical, in all the various materials, which may be briefly summed up as sculpturing, handling of metals, enamelling, the use of crystals and gems, woodwork, textiles, painting on glass or walls, or tablets, or on other varied objects, like a true ecclesiologist as he was. There can, I fear, be little doubt that he shortened his life by the enormous toilsomeness which he imposed upon himself at the Law Courts in his determination to make them perfect at every point.

The question has sometimes been asked whether such subsidiary designing is a legitimate portion of the architect's profession. I can only wonder at the narrowness which seems to me to prompt the doubt. The architect surely is "*poietes*" and his work a poem; and, as every poet who loves his work strives to make it as polished and perfect as he can in every stanza and every line, so ought the architect to act. Architect, we know, means chief workman, and to the chief workman must belong the direction of all the work. But, perhaps, the architect feels that some one else can more successfully handle these accessories than himself. If so, he is right to use that superior gift, but in so doing he so far admits his colleague to a partnership in the poem.

All through Mr. Street's career his fidelity to Gothic was so immaculate that I believe he only twice in any original design strayed even into Norman or Romanesque,—in the private chapel for Lord Crawford at Duncuch, and in the Guards' Chapel, where the choice was in-

evitable. Never so much as with the tip of one finger did he ever touch the so-called "Queen Anno" style.

Before I close, I must speak of the latest, and in some respects not the least noble, episode of Mr. Street's life,—that of his elevation to the dignity of President of the Royal Institute of British Architects, and his discharge of its exalted functions. The Institute is a commonwealth, and, like other commonwealths, it has its parties and its schools of opinion, both in matters administrative and upon artistic questions. Without such liberty of thinking there could be no life in the body. "Thou hast no no tides, poor soulless sea," would be the contemptuous verdict passed upon it. Now no man enjoyed, as I have shown, the luxury of believing his own and disbelieving other peoples' opinions to a more robust extent than Street; and so it happened that his election to the chair of the Institute was not the unanimous tribute at the visible close of a long life to the venerable deserts of the old man eloquent of pencil as of voice, but the result of a healthy party fight to choose the leader who should, as vain man anticipated, arise, in all the power of a life mature and not declining, to hold aloft for many years the standard of his convictions. So Street won by a very narrow majority. But then came the marvel. The shadow, luminous and mysterious, seemed to have been projected. The old mind of the buoyant party man was there, but purged, enlightened, elevated. The intellectual care for all that was for the good of architectural men, architectural art, architectural ministrations to the welfare of society, as embodied in the Architectural Institute, was the President's duty and delight. Appreciative of all excellence, peacemaker in all perplexities, he succeeded during those few months of office in winning the influence, esteem, and affection of all; and in the sad day following quickly on his death, I heard general regrets at the irreparable loss fall from the lips of those who had certainly in past years not mounted his colours.

Mr. George Aithison, A.R.A., next read the following paper on

THE WORKS OF THE LATE W. BURGESS, A.R.A.

In 1853, when I was a student in Rome, I made the acquaintance of Captain Drummond at the English Academy. As soon as the season was over he used to give picnics to the English artists and residents who still remained in town. Some place of antiquarian interest was picked out at a riding distance from Rome, and most of the company went on horseback, but there were carriages for those who preferred driving to riding. On one eventful summer morning it was agreed that I should go to Gange's stables, with a friend who kept his horse there, and get a mount, but being rather late I found every horse but one gone; this horse had been ordered by a gentleman of unknown name for an hour before, but as he had not come for it, we persuaded Gange to let me have it. We joined the cavalcade at the Porta del Popolo, and a few hours' canter brought us to La Storta; while we were waiting for the guide the carriages arrived. A short man, with light, curly hair and spectacles, was oburgating the man who took his horse. I was the culprit, and the oburgator was Burgess. However, we settled the matter amicably, and as he preferred going back in a carriage, I had the painful pleasure of returning on the beast that brought me. We examined some of the ruined walls of ancient Veii, and entered the tomb of the Lucumo, whose skull and bronze helmet, pierced through and through with the bronze javelin head, still reposed upon a central slab; the tomb was cut in the rock, the central chamber being domed and adorned with rude wall-paintings, on which Burgess descended. We then discussed our luncheon, and rode home in the cool of the evening. Of that merry company, amongst whom were G. Mason, Poingdestre, Whitburn, Eagles, &c., how few remain!

I saw but little of Burgess in Rome, but I saw and admired his designs for the church ornaments to be used in Sir Frederick Leighton's "Procession of Cimabue's picture." At Sir Frederick's suggestion, Burgess and I travelled together when we left Rome after the Holy week in 1854, and took our farewell of Mount Soracte. We travelled in *vettura*, the lumbering hackney-coach drawn by two wretched hacks that with difficulty drag you twenty miles a day, but this

mode of travelling gives you an ample opportunity of seeing the country you pass through, and the towns you stop at. We passed through Sta. Maria degli Angeli, and saw the church, rent by an earthquake, and the miserable inhabitants camped in temporary wooden barracks. At Assisi we made our first long stay; the hotel being full, we stayed at a private house, at the modest cost of 1s. 7½d. per day,—our landlady explaining that as we were English gentlemen accustomed to luxury she could not charge less. Poor Burgess suffered there from a continued diet of pigeons stuffed with rosemary. After exploring the town, and getting a pair of 5-foot rods made by the carpenter, we made studies of the painted decorations of the Churches of St. Francis. In our spare time we strolled the town, read Dante and Sacchetti, discussed art, and had our first experience of a slight earthquake. We then went to Perugia, and saw the Sala del Cambio and other buildings of importance; and then took the diligence to Florence, discussing the Roman defeat as we passed Lake Trasymene.

Our plan was to read Murray on the way, mark the objects of interest, on our arrival to go up the highest tower and see the town and its surroundings, and then to explore the town, visit the places we had marked, take notes, and measure such things as we thought would be useful.

Burgess was then thoroughly versed in the Gothic architecture of England and France, and had come to Italy mainly to study architectural painting and mosaic, goldsmith's work and secular buildings, as he despised the Gothic architecture of the Italian churches. After seeing Florence we went to Siena, measured the Palazzo Tolomei and other palaces, went to San Gimignano delle belle Torri, visited Boccaccio's house at Certaldo, went to Pisa, and, while Burgess sketched in the Campo Santo, I measured an old brick palace there, the Café del Usaro. We then went to Pistoja, measured the Palazzo della Comunità and the Palóto, that splendid altar-front of gilt silver and enamel, made to replace the one stolen by Vanni Fucci and his friends. We then went back to Florence, measured the battlements of the Palazzo Vecchio, the staircase of the Bargello, and other parts of interest, and here Burgess was laid up, and I measured the Palazzo Salviati, went to Prato, and to see some friends in the country, while he designed and executed a book-cover for Tennyson's poems. As soon as he was well we went back to Pisa, and saw the magnificent festival of St. Ranieri, which only takes place once in seven years, to commemorate his return from the Holy Land. The crossings of the streets through which the procession passed were carpeted with flowers in patterns, and at night the whole town was splendidly illuminated, so that when we left after midnight for Lucca, Pisa looked like a town of fire. We went from Lucca towards Modena, but where the countries join on the mountains, we were stopped, and found that we must either go back or hire a military escort, on account of the cholera in Tuscany; and though we thought this a curious sanitary precaution, we were half inclined to incur the cost, as we thought our parents would be flattered by our making a sort of royal entry into Modena guarded by a troop of horse soldiers; but economy prevailed over vanity, and we went to Leghorn and took ship for Marseilles, stayed at Lyons, thence to Beaune, where we measured the roof of the hospital. I let down the keys of this loft, tied on to a tape, through a hole in the floor, to see how high the roof was above the stone pavement; their jingling on the stones, and then ascending, was taken by one of the patients for a sign, and we had much bother to persuade the abbot to let us continue our measurements. As we were both in blouses, and black as sweeps, our appearance was not in our favour.

Thence we went to Dijon, where we measured the porch of Notre Dame, and the front of the Hôtel Chambellan. It was arranged between us that we should do no work on fête days, but always take a stroll in the country; but, in point of fact, I do not think we ever did; for, before we even reached the suburbs, Burgess always espied a by-street that promised to contain some archaeological treasure. He had long been anxious to find an example of the red cloth put under pierced ironwork, and in one of the French towns we found a pierced knocker-plate in a back street. He explained the case to the occupier, a smith was found at

a neighbouring wine-shop, and the knocker and its plate were taken off, and sure enough under the plate was found a piece of cloth, blackened for the most part, but with a bit of scarlet here and there, where wet and dust could not penetrate.

From Dijon we went to Troyes, and measured part of the cathedral, which was under repair. We then went to Ville Neuve L'Archevêque, and thence to Sens, where we saw the "Anthrophagi and men whose heads do grow beneath their shoulders" sculptured on the porch of the cathedral, and here we parted,—I to go to Paris, and afterwards back to Italy, and Burgess to Chalons-sur-Marne and elsewhere.

During our travels I learned he was born on the 2nd of December, 1827, that his father was the well-known engineer of the firm of Walker & Burgess, that he had matriculated at the University of London, had attended some lectures on engineering at King's College, that in spite of his father's desires and the splendid prospect open to him if he became an engineer, he was so full of love for antiquarianism and Gothic architecture that he would be nothing but an architect; that he had been articled to Elre, had afterwards been with Sir Digby Wyatt, had sketched in England and elsewhere with Mr. Salter, measured Amiens spire with Mr. Warren, had travelled in France with Mr. H. Clutton, and helped him with the illustrations of his "Domestic Architecture of France," and that through the advice of Mr. Bruce Allen he had determined to measure every thing important, and find out its whole method of construction. When I met him he was a rabid Medievalist, and believed there was no salvation out of the thirteenth century. Sir Digby Wyatt had nicknamed him "Troy," because when it was suggested to Burgess that he should make a view of Troy, he said that, in accordance with the custom of the Middle Ages, he should make all the architecture of the thirteenth century.

He was so profound an archaeologist that he used to jeer at Elre for declining to give his opinion on the age of a wall because there were no mouldings on it, saying he should have known by the size, working, and bonding of the stones, and by the mortar joints, to what age it belonged.

You may easily imagine his scoffs at the Pagan architects of the Renaissance, and his hope that some day "he might make that old wretch, Sir Christopher Wren, turn in his grave." He did, however, allow there was one Pagan architect living that he respected,—Professor Cockerell,—though he added there is so little to learn in the style that the merit is small as compared with learning the Medieval style.

I have always looked upon it as one of the privileges of my life to have had the chance of being constantly with this genius for so long a period. Unfortunately, biographical sketches of men of thought are necessarily dull; the flame of genius can only be seen in their works, and those workings in the alembic of the mind by which new products are distilled from the materials provided, are necessarily hidden from mortal eyes; the exact portraiture of the man cannot be given without offence during the lifetime of the persons to whom he was dear.

The minute, exact, and profound knowledge of Medieval architecture, decoration, furniture, and letters that Burgess had acquired was tempting him to produce a treatise on them for the use of students, when the publication of Viollet-le-Duc's "Dictionnaire" took the wind out of his sails,—perhaps fortunately,—for the publishing architect was turned into the practising one. But we are now speaking of him in the embryo state. He was then one of the most rapid and brilliant draughtsmen I ever met with, and had the most inexhaustible fund of invention; illustrations of literary incidents, designs for chalices, crosses, knives, scent-bottles, combs, alphabets, caricatures, Medieval towns or buildings, came forth from his pen, pencil, or brush without a moment's reflection; and although his humour was shown rather by his drawings than by his words, he would on occasion give vent to epigrammatic sentences. "Academies are the death of art" may be instanced as one of them.

At this time his one besetting fear was lest he should be carried off by accident before he could show the world his genius and his knowledge; his one great hope that he might hereafter partly realise in a house of his own his views of artistic completeness, and no

Arab ever had more gorgeous visions than Burges. This visionary house was to be of perfect Mediaeval pattern, full of quaint carvings, and blazing with colour, hung with costly stuffs embroidered in gold, and lighted by silver lattices whose storied panes were of cut gems. He was to have jewelled chalices to drink from, and aloe and sandal wood to burn.

Even the castle-building of so eccentric a man of genius seems to me to have its value as giving us some insight into those powers he felt himself possessed of and that he most wished to exercise. Well, it was this: he would be first an architect and build a specimen of every ordinary human construction except a cathedral; he would amass enormous wealth, and spend some of it in realising his views in his own house; he would marry; he would, as soon as these varied works were done, become a Member of Parliament, and correct some of the abuses of society; he would then go into the church, become a bishop, and, with his wealth, build a perfect cathedral of the most costly materials, adorned with the most perfect specimens of all the subsidiary arts; and, when this was done, he would end his days as a monk or a hermit.

He returned to England, I believe, at the end of 1854, and in the spring of 1855; he had then designed a claret-jug and a jewel-coffer for a client, and in the same year he entered into competition with Mr. H. Clutton for Lille Cathedral. In March, 1856, I went with him to Lille, and saw the competition drawings, and we afterwards went to Tournay. It is said Viollet-le-Duc at first believed that Clutton and Burges's set were some old drawings of the thirteenth century, until he saw "Whatman" on the paper. For once, Burges met his match at repartee, which was no small thing, for, when angered, he was like the bee, *ponit animum in punctu*. He was fond of talking to workmen, and was always anxious to know of them how long they thought it would take him, the accomplished architect, to learn their trade. On this occasion he went into the kitchen of our hotel at Lille, and saw the cook, a little hunchback. And after Burges had explained who he was, and that he expected to have the cathedral to build, he asked how long the cook thought it would take to learn cooking thoroughly. "Ah, sir, in a fine art like mine one is never master of it; one is always learning."

In 1857 he restored some of the images and designed others for Salisbury Chapter-house, and restored the building, in conjunction with Mr. H. Clutton. He gained the first prize for the Memorial Church at Constantinople in 1859; he designed the cathedral for Brisbane, restored Waltham Abbey, and in 1862 gained Cork Cathedral, in competition, altered Gayhurst House for Lord Carington, and delivered the Cantor lectures at the Society of Arts; in 1864 he decorated Worcester College Chapel, Oxford; in 1865 he began the restoration of Cardiff Castle, and built a house for Mr. McConnochie at Cardiff; in 1866 he designed the School of Art at Bombay; in 1867 he competed for the Law Courts, and published a book of his designs for them. In 1869 he built Knights-hayes for Sir J. H. Amory, bart.; and in 1870 he built the church at Studley for Lord Ripon, and that at Skelton for Lady Mary Vyner, and published his book of architectural drawings, containing many of the examples we measured together. In 1872 he began his series of drawings and models for the decoration of St. Paul's Cathedral, London. In 1873 he competed for the Cathedral at Edinburgh, and made the drawings for Hartford College, U.S.; built Templebrady Church, Ireland, and the Speech-room at Harrow. In 1876 he began to build his house in Melbury-road, the internal decorations of which were not completed at his death. His last work was the additions to the Maison Dieu at Dover, to convert it into a Town Hall, since completed by Mr. Pullan.

On January 28, 1881, he was elected an Associate of the Royal Academy, and he died on the 20th of April of the same year. Rarely has any architect been followed to his grave by so many mourning friends, mainly architects from all parts of the country.

A book of his designs was published last year by Mr. Pullan, his brother-in-law.

It seems to me that there are now only three points for our consideration,—the effect of his works and teaching on public opinion, on the

younger men of the profession, and the merits and peculiarities of his works. Horace Walpole, in the middle of the last century, advocated the return to Gothic architecture as a patriotic and antiquarian revival, and made rude attempts to apply Gothic ornament and surface decoration, to buildings. His notion spread, but it was not till nearly the second quarter of the present century that this antiquarian revival was passionately advocated; and this outcome of late Roman Catholicism was called "Christian," while its supporters poured out floods of obloquy on those who admired or practised any other style.

Augustus Welby Pugin began the onslaught with his "Apology for Christian Architecture," and the public, who are always interested in a literary conflict, especially if the *odium theologicum* can be imported into it, were easily converted to Gothic, as all forms of beauty were equally indifferent to them, and the advocacy of Gothic supplied them with staple for discussion and abuse. The battle was kept alive by such generals as Sir Gilbert Scott, Street, and Burges, and such was the enthusiasm of the first and last for Gothic that nothing but great temptation would make them abandon it. Burges, who was the youngest, ablest, and most learned of the three, naturally produced a powerful effect on the public, though by some ill-luck he never got his fair share of the large works carried on. The effect he produced was not a little assisted by his quaintness and pungency of expression; yet in spite of all this passionate advocacy, other influences were at work which silently but surely sapped the foundations of this new Jericho, whose walls at last fell without even the sound of a trumpet. It was generally felt that dignity and simplicity were more allied to our present civilisation and turn of thought than Gothic perplexity. For constructive purposes the introduction of iron had superseded the methods used in the Middle Ages, and the advancing arts of painting and sculpture found themselves too incongruously surrounded in Gothic buildings to be used with effect, even when their highest forms were not resolutely excluded by the architects themselves. The simplicity and matured elegance of form in the higher works of painting and sculpture supplied an inconvenient standard of judgment in Gothic buildings. These considerations had, however, but little effect on the young and ardent enthusiasts of Gothic, steeped to the lips in the diatribes of Pugin and Ruskin; Burges's pupils and young admirers drank in with undoubting faith the precepts of one who was so enthusiastic, so certain, so skillful, and so learned, and they were quite prepared to accept the architecture of the thirteenth century as the ultimate standard of perfection, for were they not always hearing the master say, in criticising any new work, "I ask myself what a thirteenth-century architect would have done in this case?"

I never saw any of Burges's designs for buildings that were made before he went to Italy, and while he was there he did not fail to appreciate the grandeur and massiveness of its palaces, and as he absorbed the good from all the Gothic examples he saw, his work for ever after bore traces of that influence. In the same way he was impressed with some Arab forms which he afterwards rarely relinquished. Another marked peculiarity was his fondness for circular forms, and it was rare indeed to find any considerable building in which this fondness was not shown. Nearly all his designs for cathedrals show his preference for the circular end over the square. The Law Courts and his own house show in a marked way this tendency.

His works, or at least those in which his judgment was unfettered, exhibit his predilection for vigorous simplicity; better examples cannot be given than Mr. McConnochie's House at Cardiff, and the Harrow Speech-room. If the Law Courts were to be Gothic we must all regret that he was not entrusted with them, as, in his design, the Strand front was a grand composition, and the proportion of the parts noble. Even Sir G. Scott, a rival competitor, speaks of it thus: "While Mr. Burges, though his architecture exceeded in merit that of any other competitor, was, nevertheless, eccentric and wild in his treatment of it." How the Government could have passed him over when they had such a genius to their hand, is difficult to understand, and the plea that his plan was bad is well disposed of by Sir Gilbert:—"An able and artistic architect can surely make a good plan, while no amount of skill

in mere planning can by itself enable a man to produce a noble building,"—a truth that those who have the disposal of our new public buildings should take to heart.

Burges's skill, however, was by no means confined to pure architecture: his inexhaustible invention was shown in his church ornaments, in the accessories to houses, and in the quaint designs for figures and figure-subjects with which all his works were overspread. Perhaps the stained-glass windows of his own hall afford one of the best illustrations of his skill and inventiveness in this direction. The subjects are the spirits of Sound floating out of the ringing bells. His devotion to one phase of art may be well recommended to the student; his desire to master all the cognate arts may be pressed on the attention of those whose genius will enable them to imitate him, and we have but two regrets to add,—one, that a man possessed of so strong a personality did not leave an autobiography; and the other, that we have not more of his executed works.

Mr. Charles Wethered next proceeded to read his paper on

VIOLLET-LE-DUC AS ARCHITECT AND ART HISTORIAN.

BUSILY engaged in another profession, and long enough in sympathy with your pursuits to be sensible of my many shortcomings, it is only by the courtesy of the Council of this Institute that I am now permitted to direct your attention for a short while to some aspects of the life-work of the gifted man whose name will be associated for ever with the architectural glories of France.

I must ask an assemblage like this to accept in a spirit of kindly criticism the scattered observations of an outsider who happens to have seen a good deal of the executed work of the master whom to know was to regard with feelings of veneration and affection.

To this word of self-introduction I may add that I hope my present paper will be supplemented before long by another, entitled "A Fortnight in Switzerland with Viollet-le-Duc," which will comprise a sketch of his striking personality and a further glance at his manifold powers.

Eugène Emanuel Viollet-le-Duc was endowed with widely-contrasted gifts, only bestowed together in fullest measure on minds of the first order. He was at once an intense realist and an idealist. He possessed the scientific bent for getting at the core of the facts of nature, and he had also the expressional and shaping faculty which can reveal emotional truths through the language of art.

The works of a deceased master are an abiding presence, and in them we speak of him as historically living. In this approaching Viollet-le-Duc in his twofold capacity of architect and historian of art, I can do no more now than take a swift run across the "*vrai domaine royal*" claimed for him by Sainte-Beuve, over which he equally holds sway as master of "the compass, the pencil, the chisel, and the pen."

Turning first to two or three of his written and illustrated works which come well within the scope of this Conference, I will then pass on to speak briefly of the artist who creates of himself, and who also brings the buried forms of the past back to life.

Art with him was a strong instinct from his very cradle, and his family surroundings were well fitted to nurture the growth of a child of genius. His father was a man of mark in literature, and his uncle, M. Déclauze, an artist of distinction. Every week at the house of one or the other he met some of the most gifted intellects of France. At these *réunions* he made in his earlier years the life-long friendship of Thiers, Rémusat, Mérimée, Aupiais, Villemain, Stendhal, and others known to fame. Always on the alert, we may be sure the receptive mind of young Eugène assimilated innumerable ideas from listening to the best literary and philosophical talk of the day. His education had breadth and thoroughness by no means common fifty years ago. It was completed by more than one lengthened stay in Italy, and supplemented by a course of dissection at one of the medical schools of Paris, in order to obtain a practical knowledge of anatomy in relation to external form. Always self-reliant, by the time he was eighteen he had made more than enough pocket-money by his water-colour drawings and modelings to buy himself a horse, and with this helpful companion the young enthusiast in art

made the first of a series of journeys which enabled him to visit, measure, draw, and describe the chief ecclesiastical, military, and civil buildings of the Middle Ages over the greater part of France. Here the boy was father to the man, and the immense mass of materials thus collected in his youth laid the foundation of his *opus magnum* so well known to you, the "Dictionnaire raisonné de l'Architecture Française," followed by its complement, the "Dictionnaire raisonné du Mobilier Français," forming together sixteen volumes, illustrated by nearly 5,000 engravings, finely drawn on the wood by himself. For the archaeologist and student of history these volumes unlock the vast treasure-house of the Mediæval world. Given a building of ancient France,—to take an instance of the thoroughness of his insight and teaching,—he is not content with settling the date, and describing the external characteristics that determine the style or school; but, if I may apply surgical terms, he submits it to careful dissection, and rewards his readers with the knowledge of its anatomy and physiology,—the structure of the whole, and the functions of its various members. Unfolding its origins, he presents it as a product of evolution; as a more or less perfect type of a phase of development; and as the logical expression of the needs, customs, aptitudes, and aspirations of a people and period.

Mr. Street has gracefully acknowledged his leadership in these researches in his "Gothic Architecture in Spain:—M. Viollet-le-Duc's articles in the 'Dictionnaire raisonné,'" he states, "on the planning of French churches, are extremely valuable, as indeed is all that he writes; and I take the opportunity afforded me by the aid which he has thus given me to express the gratitude which, I suppose, every student of Christian art feels for what he has done towards promoting its right study."

Not a few of the 800 articles are complete essays: that on mural painting, according to M. Véron, editor of *L'Art*, "is a veritable treatise on chromatic harmony by a man thoroughly master of the subject. It contains a multitude of facts as interesting as they are little known."

Mérimée, in a learned review, extolled alike the prodigious fecundity of the writer and the force and finish of the draughtsman.

His "Lectures on Architecture," so ably translated by Mr. Bucknall, twenty in number, are a *résumé* of his doctrines generally. This critical interpretation of man's graven dialect in the monuments of the past is a philosophy of architecture, and within its compass a philosophy of history itself. To myself, a simple searcher after the beautiful, with vague notions of art, it came as the revelation of æsthetic truth. I believe it to be the book of all books for obtaining a wide outlook over the world of man's handiwork,—over that combination of the arts which gives architecture vitality and voice. This treasury of facts and ideas, of axioms and apophthegms, is an authoritative code of arts, of laws bearing upon their kinship and interdependence, upon what they are in themselves and in relation to each other. The depth and range of his acquirements are not less conspicuous than is his aversion to dogmatism and exclusiveness. Bringing the analytical method to bear upon his investigations, he verifies his conclusions by synthesis. He resolves the work under review into its essential elements, tracing the latter back to native instincts and gifts. He shows how these elements are severally combined by the Greek, the Roman, and Mediæval builders, and how, by bringing principles into harmony with form, they have left us diversified types of the everlastingly true and beautiful. To the neglect of these fundamental principles he ascribes those hybrid productions of modern times, Neo-Greek, Neo-Roman, Neo-Gothic, which defy classification,—a medley of styles, fashions, epochs, and means of construction."

At an influential meeting in Paris, held after the close of the exhibition of his works at the Musée de Cluny, it was resolved to reproduce by the best technical methods a selection from his drawings, representative of his range and manner generally, including many examples of detail in relief, section, or profile, as they flowed from his hand for execution by his school of artists and craftsmen. A sum of several thousand pounds was at once subscribed, and a committee formed for carrying out the project in a way worthy of "le grand patriote et le grand artiste." The resulting portfolio of *Compositions*

et Dessins, just given to the world, is at once a monument of his creative versatility, and the fittest memorial of an architect ever raised by his *confères* and friends. In these facsimiles the accent of the master is never missing,—in his unerring firmness of touch and fine sense of form, in the calm dignity of his statuary, and in the life and vigour of his ornamentation generally. In his constructive and decorative designs we discern unity amidst plurality, combinations of the grand and the simple that result in a style of distinction with lucidity, so that he who runs may read the *raison d'être* of every detail.

Whatever the scale or subject may be, whether designing a reliquary to be worked by goldsmith or silversmith, or planning a vast cathedral front, with its eloquent chapter of sculptured harmonies, like that of Clermont-Ferrand, we everywhere perceive the impress of a master-hand.

His figure-subjects and carved work generally,

"Cornice or frieze with bossy sculptures graven,"

as well as his wall-paintings, are essentially monumental, and decorative in the true sense,—*en rapport* with their surroundings, from which they cannot be detached, even in drawings, without our losing something of their full effect.

Who has not loitered to observe his happy and often grotesque renderings of animated nature in beasts of the field and fowls of the air that catch the eye of the passer-by from every coigne of vantage outside the cathedrals of Rheims and Paris, not to mention endless other examples of his humour in this vein to be met with here and there throughout France? Whether wrought in stone, wood, or iron, they exhibit a singular mastery of animal configuration and gesture, with a facile fertility of production that never repeats itself. Thousands of these, replacing originals long lost, are recreations rather than reproductions.

Very notable, too, are his adaptations of the facts of plant growth, displayed in a very world of bud, leaf, flower, and fruit, with a subtlety of curved line and dash of manner that always charm the spectator. "Joy's soul lies in the doing" of such work.

The revival of the higher art of the copper-smith and leadbeater in connexion with architecture is largely due to his plastic handling and teaching. As surpassing examples of the handiwork of the former, I may instance the statues grouped around the *fiche* of Notre Dame, and the figure of St. Michael crowning the chapel of Pierrefonds Castle; of the latter, the crests, crockets, finials, &c., on the adjoining roofs.

To this phase of his genius we owe his achievements in a sphere and period which Mr. Hamilton, in his interesting History of *Autun Cathedral*, has named "the epoch of Viollet-le-Duc,"—the sphere of architectural restoration.

Restoration is an impulse of our day to conserve the good bequeathed to us in every architecture, and to undo the misdoings that have degraded or obscured earlier and better work, paying due regard to later additions of exceptional worth. It is to give a building, whose constitution has suffered from age or injury, a renewal of life, by treatment adapted to its peculiar temperament.

Viollet-le-Duc's grasp on the past, the logical bent of his mind in the observance of principles, his wealth of ideas and ability to give them shape, have made him *facile princeps* of Continental restorers. His ideal restoration of the Baths of Caracalla is as vivid as that of the Château de Coucy on paper, or of Pierrefonds, in fact.

A lover of unity amidst infinite variety, the marvels of the Middle Ages were to him well-ordered organic wholes,—the embodied ideals of their framers or of successors inheriting their instincts,—and not as they have too often become at the hands of latter-day meddlers, a *mélange*. Order, Heaven's first law, was theirs and his. They solved their problems in stone by mathematics, and enriched their constructions with shapes and suggestions gathered from living nature in field and forest around.

Having given, however imperfectly, some notion of Viollet-le-Duc's spirit and method, but short space is left for me to ask you to accompany me in thought to a few of the more famous buildings upon which he has lastingly set the sign manual of his art.

Monsieur Baudot, an accomplished disciple

of his master, and now Inspector General of Historical Monuments, has, through a friend, honoured me with a note in point well deserving, I think, of being read to you. He writes:—

"Viollet-le-Duc began in 1863 the interesting work of completing the Cathedral of Clermont, i.e., two bays of the nave similar to those already existing, also the two towers and the principal facade. For the facade and these towers he had no other data to work upon except substructions, the cathedral having never been finished at this point. There were, in fact, only foundations, and he had to conceive a design, that is to say, to create the work in question. Availing himself of the experience of the Mediæval masters, without tentative effort he created at a stroke that grand composition,—facade and towers; and I do not think there exist in the Mediæval period towers or spires of finer outline, or more skilfully planned in point of construction. It will be understood that this work, like the rest of the cathedral, is executed in the style of the close of the thirteenth century. Nevertheless, in the ornamentation and in the outlines we find a character of simplicity which belongs especially to Viollet-le-Duc, who did not copy, but interpreted the Middle Ages by drawing his inspiration from nature as regards the flora, fauna, and statuary."

In the execution itself Viollet-le-Duc conducted only a part, and when he relinquished his post as Director of the work in 1874, the work was carried up only as far as the top of the nave. At this time I was commissioned to complete it, and consequently to supply part of the details of execution, but I did my best to interpret as completely as possible the master-thought which had designed the whole, and had supplied details of every kind for the greater part of the work, the honour of which belongs entirely to him."

The church of the Benedictine Abbey of Vézelay is the most imposing remnant left of that great school of Cluny which had so marked an influence in Burgundy, and, as we learn from Viollet-le-Duc, over Christendom at large. In 1839 it presented, from long and general neglect, an aspect so forlorn and threatening that it became a question with the authorities whether its fate should not be settled by a *coup de grâce*. The loosened masonry of its Romanesque vaulting that for 600 years and more had spanned the nave with a grandeur hardly to be seen elsewhere rested on toppling walls ready to fall at the first stroke of the hammer. Mérimée, then Inspector-General of Historical Monuments, was one of the first to recognise the practical genius of Viollet-le-Duc, at that time an untried architect of five-and-twenty, and to him he entrusted the important task of its preservation. It was the starting-point of his career as a conservator of things of the past. He was wont to speak of it as his *premier amour*. The fruit of that first love is a finished edifice as strong as when built by Cluniac masons in the twelfth century. Left to the tender mercies of those doers of nothing who are opposed to all restoration, this ancestral monument, seen again to-day in all its perfected strength and severe beauty, would have become ere this a huddled mass of ruins, —*rerum confusa sine ordine moles*.

Shortly before his labours at Vézelay he was engaged under Lassus in resetting that architectural gem of purest ray serene, the Sainte Chapelle of St. Louis.

"Many-towered" Carcassonne is an ancient and mighty stronghold of Languedoc, which every tourist in the Pyrenees who loves the past should step out of his way to see. It is in all ways the most perfect example remaining of the systems of military defence that prevailed in Europe from the eleventh to the fourteenth century. Within the citadel may be seen the various implements of war used through the ages swayed by the baron and the monk, which have been restored or constructed by Viollet-le-Duc, whose genius as a military engineer has been fully recognised by authorities on both sides of the Channel. With its restored belongings, it is much in the same state as when, "in 1356, this fortress effectually resisted the Black Prince, who burned the suburb below, and ravaged, with fire and sword the whole of Languedoc."

The Romanesque church of St. Nazaire, with the ramparts, is well called by Murray "a perfect gem of architecture," and unlike anything in France." Less than thirty years ago it was all but a pile of ruins. The vaulting had fallen in; the walls were cleft and rent; the stained glass, in brilliancy and glow of colour equalling that of Chartres, was broken and detached. Here again his reshaping hand has

"Softened down the hoar austerity
Of rugged desolation, and fill'd up,
As 't were a new, the gaps of centuries."

The Château de Pierrefonds, with its encircling towers, donjon-keep, and chapel, dismantled and in great part destroyed at the beginning of the seventeenth century, has risen again with not less outward strength and interior splendour than when it dominated the Forest of Compiègne in feudal times. This illustrious palace and fortress in its renovated state is a series of deductions in stone by the Cuvier of

architects, who re-dresses the disarrayed structures of bygone ages with the vesture of his art. Sections of mouldings and other fragments rescued from the carefully-sifted debris are here and there replaced *in situ*, and give the key, as it were, to neighbouring details. In this restored page of the historical arts of France we find a pervading unity,—a concord that comes of the sense of fitness where all things are in keeping,—an *ensemble* which earlier schools possessed, but which in the chaos of our modern means and materials we have to a great extent lost.

It would seem that when a building has gone to the bad some of our notabilities in the republic of art would leave it as a dwelling for rats and carrion birds. From its relevancy to this part of my subject, I will presume to call their attention for a moment to what Frederick Schlegel says of the Abbey Church of St. Denis, when he beheld it in 1804 as wrecked by the Revolutionists:—

"The deep silent melancholy it inspires becomes stronger and more profound in approaching this ancient and now ruined cathedral. Every part that could be destroyed without too much labour and difficulty has been thrown down; the naked walls alone are left standing with the massy pillars and the arches that rest upon them. As the doors were opened a host of jackdaws and rooks, the sole inhabitants of the desecrated sanctuary, took flight, and when the dust they raised had subsided, we saw the upturned graves of the sovereigns of France, each of which the viceroy carefully pointed out."

To the critic whose own mood of mind is the measure of excellence in art, St. Denis may be a "whited sepulchre"; but posterity will have cause to thank Viollet-le-Duc and his band of skilled artificers for the renewed completeness throughout of that noble fabric,—for the restored tombs and effigies of a long line of kings, not so very long ago lying mutilated and scattered over France. "Look on this picture, and on this,"—contrast St. Denis as ravaged by the iconoclast, with the Church of the Patron Saint as we see it to day, and who but lovers of decay and debris will doubt the lasting good done by men working in the spirit, and following the methods of the old builders?

The learned German critic also describes the condition of Notre Dame at the same date, as follows:—"During the first Revolution the front was injured in various ways, the exterior being despoiled of its decorations and the statues torn down and destroyed. Worse than all this is the injury which the interior has sustained by absolute mutilation. The clustered pillars supporting the roof have been filled in, rounded and modernised as much as possible, so as to give them the appearance of solid circular columns. The effect thus produced is completely inconsistent with the plan of the exterior. . . . An intolerable spirit of persecution in the arts was often seen united with that inclination to imitate the false antique, which seemed epidemic in the eighteenth century."

Certainly man's rage outside, and the haunting spirit of the Renaissance within, had done much to damage the aspect of the Church of Our Lady at Paris. The removal of the worst of the incongruities of later times, "the pomps of Louis Quatorze and the vanities of Louis Quinze"; and the added embellishments of Viollet-le-Duc, have brought about the harmonious change most of you have seen.

His works there culminate in that embodied conception of a tradition and aspiration, the new central spire or *flèche*, a masterpiece of scientific framing in oak within, and an artistic thing of beauty pointing heavenwards without. At its base stands the statue of the great architect not "in his habit as he lived," like the one just erected on the front of the Hôtel de Ville, but as befits the place in the costume of a Medieval master-mason. It is of hammered copper, wrought by his metal-workers, and placed there as an enduring mark of their homage and profound respect. The art of the modeller and the science of the geometrician are also blended with happiest effect in the new baptismal font of bronze. So fine and bold are the figured reliefs of saint and symbol in this superb casting, that it is only by examination of the working drawings we notice how the freedom of the one in sweep and emphasis of modulated line is regulated by the applied laws of the other. Here, as in his works elsewhere, the artist and the man of science stand side by side. This duality is the note of his individualism, and the mental groundwork of his strength in the realm of imagination and in the world of fact.

And now, as the passing minute warns me I

have claimed more than my share of your kind attention, I will add my concluding word.

Nous know better than yourselves, gentlemen, that a new architecture is the product of the combined effort of at least several generations; never the creation of one man. Viollet-le-Duc was not the maker of a new style; he did not attempt the impossible; but he has laid down with all the weight of his logic lines of direction for the path of the future. We must proceed, he insists, not by imitation of forms, but by deduction of principles, aided in their application by all the lights modern science can bestow, if we are to possess a constructive art worthily expressive of our age and civilisation. M. Baudot maintains, with the ardour of a follower, that this programme can be best fulfilled by a serious study of the "thinker and worker," whom he designates "*le chef de l'Ecole de l'avenir*."

The scientific or other specialist may here and there in his own groove find something open to objection, but, taking the illustrious Frenchman all round, as a theoretical and practical architect; as an art-historian bringing the light of the past to illuminate the present; as a matchless teacher, in the workshop and in the studio, of arts which are the sisters, and crafts which are the handmaids, of architecture, he stands foremost as "*l'homme du siècle*,"—the man of the nineteenth century.

A report of the discussion which followed the reading of these three papers, together with some account of the Visits, will be found on other pages of this week's *Builder*.

INTERNATIONAL HEALTH EXHIBITION.—With the *Builder* for May 17, will be issued a SUPPLEMENT, which will be devoted to Descriptive and Critical Notices of the principal Exhibits, which will be continued from week to week as far as may be found necessary. The ILLUSTRATIONS will include a view of the MEDIEVAL STREET at the HEAVEN EXHIBITION, by Mr. G. H. BUCH; PETERBOROUGH CATHEDRAL. Measured Drawing of portion of Interior, showing part of the Restoration work in progress; CHURCH OF ST. MICHAEL, COPENHAGEN. Mr. JAS. BUCK, Architect; METEOROLOGICAL COLUMN in the Public Gardens, Stuttgart; ROYAL ACADEMY SCULPTURE, "The Water Lily," Mr. T. WOOLNER, R.A. Office: 46, Catherine-street, Covent Garden, W.C.

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SATURDAY, MAY

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The Health Exhibition.

ALTHOUGH some two or three weeks must yet elapse before the whole of the vast display at South Kensington is completely arranged and catalogued, the great proportion of the galleries are now filled up,

and there is every probability that the show will prove as attractive to the public as was the Fisheries Exhibition last year. We use the word "show" advisedly, for there is no question that by the majority of visitors the Exhibition will be regarded in this light, just as the "Fisheries" was last year; and if the acquirement of increased knowledge as to the conditions of healthful living were really the sole object of the collection, this end might have been more practically attained by a much smaller and less multifarious selection of exhibits. In the introduction to the catalogue, indeed, we meet with the frequent reiteration of the caution that objects cannot be accepted for exhibition unless they have a direct bearing on health; but in how liberal a spirit this has been interpreted may be gathered from the fact that among the objects exhibited are the cars with which the Oxford and Cambridge rowed their last race, as representing "an amusement specially conducive to health." On this principle the Exhibition might have included hunters, bicycles, cricketing and lawn-tennis implements; and these things may possibly be arranged in some part of the labyrinth which we have not yet penetrated. But there are many things the connexion of which with health is still more remote. Many of the exhibits among fittings of dwellings are simply stands of decorative wall-papers by different firms, arranged to exhibit artistic effect, just as they might and would be found in any exhibition of decorative art, and the gallery of "Science and Art" includes a collection which might have been supposed to be more directly connected with the work of the great establishment on the east side of Exhibition-road. The scenic reproduction of Old London, which is probably to many the greatest attraction of the Exhibition, might have been made historically instructive from the hygienic

point of view, if the idea which was at one time entertained, of representing progressive stages in the fitting up of the interior of houses, had been carried out. This would hardly have been possible, we should think, in the time available, as such a scheme must have been very complete and correct to have attained its object, and the complete data would have been very difficult to work up; but, as it stands, the sole relation of the old street to Health is a negative one, an illustration of the overcrowding of space, the want of good light in interiors, and the inflammable nature of the materials, which characterised the buildings of old picturesque London, and the manner in which circulation of air was choked by the massive walls which made a *cul-de-sac* of each street abutting on them. The erection is, in fact, a most charming and costly toy, which will answer the end of amusing and interesting a vast number of visitors during the season, and which may suggest reflections on the relations between the sanitary and the picturesque in building; qualities which seem in fact, though surely not of necessity, to be sadly antagonistic one to another. The fact is, the kind of ability and study which qualifies people for making sanitary improvement is rarely found in combination with that which leads to the development of artistic beauty and originality, at least so far as buildings and building appliances are concerned; in most cases each seems to demand the concentration of study upon the one class of subject. In some other points, especially in dress, we are at present coming much more nearly to the notion of a union between healthfulness and beauty, as the exhibition of costume seems to indicate; and it is easy to understand why this should be so, for dress being so closely connected with the life and design of the natural body, what best suits our bodily health is likely to be that which least contradicts nature, the great fountain-head of artistic design and form.

In another portion of this journal we are undertaking to go into the various classes of objects in detail, and with relation to their scientific value. Here we may give a brief comprehensive sketch of the contents and the disposition of the Exhibition as a whole. Entering by the principal entrance-hall, which is arranged much as it was at the Fisheries Exhibition, the long south gallery stretching in front of the visitor is entirely occupied with exhibits classed under the comprehensive title "Foods;" certainly not the most interesting portion of the exhibition to look at, for there is something chilling to human sympathies in the

arrangement of the mere raw material of food, or waxwork representations of it; the enormous collection of various things which men might, could, should, or would eat, requires, like its separate components, to be "digested" before we can get much practical good out of it. On the south side of this corridor the conversion of food substance into practical use is represented by the ordinary dining-rooms, and further west by a range of dairies, and a room occupied by the Vegetarian Society, which at this present moment represents a very interesting subject of discussion in regard to food. We suspect that we are now seeing introduced the thin end of a wedge which will eventually make a great inroad on the habits of that portion of mankind who are at present, like Bunyan's giant, "of the nature of flesh-eaters"; and though it may take a long time, perhaps centuries, before vegetarianism be adopted as a dietary faith, we are disposed to think that there is a distinct tendency arising in that direction, and that the time may come when our descendants will look back upon our dinner *menus* (preserved, perhaps, in libraries as matters of archaeological interest), much as we now regard the beef-and-beer breakfasts of Queen Elizabeth and her maids of honour. The question of the influence of food, not only on what is usually regarded as physique, but upon character, is in itself one of the greatest and most recondite interest; and, on the principle of *mens sana in corpore sano*, is certainly not unconnected with the general objects of the exhibition; and we might suggest that some of our leading physicians should give the public the benefit of their opinions on that subject during the progress of the Exhibition.*

Returning towards the entrance-hall, the first turn northwards brings us to the long gallery next to Exhibition-road (the "East Arcade") entirely occupied by heating and cooking apparatus. Probably a good many of the exhibits here have appeared in much the same quarters before, at the Sanitary and Smoke Abatement Exhibitions not very long since. The eastern quadrant is occupied by modern dress, and the practical interest of much of this can be appreciated at a glance. The Rational Dress Society exhibit costumes especially claiming to combine healthfulness, suitability, and good appearance, a claim which in some cases seems well supported. Cases of shoes designed on true anatomical principles remind us how unscientific are the foot-cover-

* We shall be very glad to find space for any communication on the subject.

ings sanctioned by fashion and the practice of the trade; but there is nothing which, in outward appearance, is startlingly at variance with what is usually worn. In fact, reform in dress on the basis of a return to first principles is practically nearly impossible; the reformers themselves probably do not know how much they are influenced by habit and convention in designing dresses; so much are our ideas on this matter dominated by what our eyes are accustomed to see, that to invent a new costume, theoretically perfect and not in any way indebted to precedent, would be almost as difficult as to evolve a new form of man out of our inner consciousness. It would be of some interest to make the attempt, however, and perhaps some hints towards it might be found among the historical dresses in the West Quadrant; for some of these, as we shall have occasion to point out when we come to notice them in detail, present almost unexceptionable models of what the main qualities of dress ought to be, to combine pleasing appearance with convenience and expression. Contrasted with these are examples of the most absurd extravagance, reproducing in actuality what we are familiar with in pictures; but the double row of ancient costumes, military on one side of the gallery and civil on the other, is of the greatest interest, whether as a study or as a mere spectacle. From a sanitary point of view, however, the historical dress exhibition would be far more interesting and to the point if we could know what was the underclothing worn beneath all these varied costumes; for that is what really affects health most. With a perception of this, the committee have devoted a portion of an adjacent gallery in the Albert Hall to the exhibition of improvements in underclothing for women, which is, of course, of special interest now that so much is being urged about reform in women's dress generally; but we should suggest that this gallery was to be open to women only, had better be enforced; it was not during the opening week, at all events, and we think lady visitors would prefer that it should be.

The galleries under the west side, next to Queen's Gate, are devoted (except the portion occupied by the Aquarium) to machinery in motion, part of which is applied to the preparation of food. In the large annexe at the exit into Queen's Gate, Belgium has its representative gallery, but this is in a quite inchoate state at present. South of the Belgian Court is the Ambulance department, at right angles to the Belgian Court. Returning eastwards, we come upon the Old London street, two illustrations of which we give this week. The first impression of this is disappointing, for a very simple reason. In a weak consideration for the convenience of those walking through the street the idea of reproducing the cobble-stone pavement was abandoned, and the "street" laid with a boarded floor, over which a little gravel has been strewn to suggest rather than to represent a street. Thus, what might have been a nearly perfect illusion is entirely destroyed. The houses and the massive city wall and gate are so well carried out that, looking up at them, we might suppose ourselves transported back to the old city, but this wretched boarded floor below transforms the whole thing to a stage "set." Those who have expected an illusion had better understand that it is not one, and they will be less disappointed and better pleased with what there is.

South of the street, machinery for electric lighting has its home, and lighting apparatus generally. North of it we enter the south central galleries, which are to be occupied with completely fitted apartments. Abutting on the north side of this are the French and other foreign galleries (like the Belgian, in a very unfinished state), and the galleries containing school and dwelling-house fittings. Between this and the south central gallery is a space devoted to all kinds of baths, amid which even a cursory glance shows some very fine specimens of completeness and finish in ablutionary appliances on a large scale. When so much expense is gone to as in some of these baths, however, one cannot help feeling that some-

thing far more attractive and pretty might be made out of baths than has generally been attempted; but this, of course, is not a sanitary question. Opposite the baths department, on the south side of the main gallery, is the octagon room devoted to the London Waterworks Companies, the beauties of which seem to have dazzled the eyes of our daily contemporaries, whose reports have described it as a sort of "Arabian Night's" palace. It is a very pretty apartment, and very systematically laid out, but that is all that need be said. The floor is of Rust's mosaic, and in the centre is a fountain with a figure of a Cupid struggling with a swan; an emblematic figure, no doubt, signifying the cupidty of the water companies. From the margin of the basin small streams, representing apparently the water of each company, spurt towards the centre. Around the octagon each company has the map of its district, and sections and views of its works; each shows also, behind a glass screen, an actual section of the materials of its filter bed, and in each angle is a tap and a drinking-cup, so that persons who feel that they "may well abide it" can drink the waters of all the different companies and compare them. The statue of Mr. Dobbs does not appear, but might have been appropriately placed in a niche somewhere in the octagon.

Walking northwards up the central avenue we come, on the right, to the "Sanitary and Unsanitary Houses," still in a shell state last Saturday, but intended when complete to represent, side by side, two houses, one arranged and fitted on true sanitary principles, the other house to have everything wrong in a sanitary point of view, and to stand as an "awful warning." The exterior of these houses is very ugly and uninteresting, in accordance with the rule which, as we have already observed, seems to govern sanitary architecture; but the juxtaposition of the two may be very instructive. If it is not too late, however, we make one suggestion, which would greatly increase the educational value of the experiment, i.e., do not tell the visitors which is the sanitary house, but let them find out for themselves. A great many people set up sanitary notions in a mere parrot manner, repeating them after some recognised authority, and never think for themselves on the matter at all, though quite ready to talk about it. If they have to make up their minds which of the two houses is sanitary, they will have to go to the exertion of observing, comparing, and reasoning; and a very good mental exercise for them.

The Chinese Court, forming part of the end gallery, is not open. We shall be curious to see what bearing its contents will have upon health; we cannot discern that the contents of the Indian Court have much to do with the subject. As to the remaining really practical divisions of the Exhibition, we have only to mention here that ventilation is represented in the "central annexe," drainage in the "south annexe" (adjoining the "Food Corridor"), and sanitary appliances in the "east annexe"; all which will receive due attention in our Supplements.

As to the possible practical results of the Exhibition, we do not anticipate that it will add much, if anything, to our present knowledge of sanitary conditions or appliances, or that the majority of those who visit it will do so with the object of serious study of the exhibits with a view to acquiring knowledge. But a more thoughtful minority probably will, and will obtain some new lights and impart them to others, and a certain general quickening of public interest in the subject will ensue. But there is a splendid opportunity presented for studying the combination of all the various parts of a habitation towards the working out of a complete whole, as healthful and convenient as the present state of science can render it; and furthermore, as a preliminary to this, an opportunity of studying to some extent the conditions of personal health apart from the habitation. *Corpus sanum in domo sano* might be the motto for the Exhibition, which is carrying the old *mens sana* proverb a step lower down in the scale of being. The reports of the judges, if time and opportunity

are allowed for their being adequately and carefully prepared, ought to be of considerable value when they appear; and in the mean time a great amount of useful information in a popular form is summed up in the shilling handbooks on various subjects which are promised, but not yet prepared, as finger-posts for the sanitary pilgrim; so that we may hope that real practical knowledge will be gleaned by many of those who will interest themselves in the Exhibition.

ARCHITECTURE AT THE PARIS SALON.

THE annual Exhibition of Fine Arts in the Palais de l'Industrie, on the Champs Elysées, has now been held without interruption for upwards of a century. It demonstrates the efforts of the French School in every branch of art,—in painting of all kinds and processes, in sculpture, in architecture, in engraving, and in enamel,—and it has engrossed, more especially within the last ten years, a large share of the national interest and thought.

This is a fact which has both its advantages and its dangers for French art. The immediate advantage is an elucidation, and a growth of the public mind, acquired through the opportunity of comparing the forms, the laws, and the relations of the arts, and leading by degrees to an initiation into the mysteries of the artist's conception, and so into the province of the ideal, formerly the exclusive domain of an intellectual aristocracy and privileged caste. The danger is that of forgetting that industry and technical skill do not suffice to make a true artist, and that those who embrace the career of art without having felt the touch of the sacred fire, run the risk of adding to the number of mediocre painters and sculptors, and so becoming objects of pity rather than of envy. Such men mistake a reminiscence for an inspiration; they have learned all of art, except that which cannot be taught.

The truth is, that in France at the present day art, as a profession, is over-stocked. An extraordinary burst of prosperity has given to artists as a class privileges of every kind, which have led to dangerous illusions on the part of the present generation. A great number of young men, confiding in the possession of a certain amount of manual dexterity, have been enticed to follow a career which promises independence, freedom of control of any sort, and access into the highest social circles, and which at once places the artist, if he is really a man of superior genius, on an equality with those who are most highly favoured by birth or fortune. The danger has, indeed, become pressing. Eight thousand artists offer their works to the judgment of those whom they have called by their votes, like a political assembly, to form a jury, whose decisions they bind themselves to respect, and 6,000 among them are doomed to have their works rejected by their self-elected judges. There is no need to lay stress on these facts; they speak for themselves. Another and a more serious danger is the debasement of the general level of art. The artist, in his desire to please the public, descends to their level, instead of inducing them to rise to his. Then, again, the necessities of social life tend to deteriorate the art of the present day. In former times, when nothing was expected from an artist but his work, social necessities had no existence for him. Nowadays they make large calls on his time and thought, and the sacrifices they exact to the fashion and taste of the day are seldom to his advantage as an artist.

With these few preliminary remarks we will now proceed to pass in extremely rapid review the works contained in the Exhibition for 1884 at the Palais de l'Industrie, giving our readers, as it were, a flying glance at the collection as a whole. It will be in accordance with our programme, of course, to give the first place to architecture.

It may be confidently asserted that of the fashionable crowds who push their way to the pictures and statues few individuals think of entering the rooms devoted to architectural works. This department, in Paris at all events,

attracts none but the architects themselves; and in spite of the efforts of modern architects to produce effects so picturesque as to compete with paintings and water-colour drawings, there can be no doubt that the fascinations of the architectural division are put forth in vain, so far as the fashionable world is concerned.

This being so, the exhibition must be considered as technical and special; and yet it may almost be objected that it is not sufficiently so, since all the charms of pencil and brush to do not constitute a work worthy of those whose duty it is to construct, and it is quite impossible to exhibit attractive designs quite incapable of execution, serving only to illustrate the difference between theory and practice.

The architect's true field of action is the builder's yard, and he must take heed lest the dreams which he strives to embody in his carefully-finished designs for exhibition should vanish as soon as they are put to the test of practicability.

One hundred and seventy architects, almost all French, are represented in this year's *Salon*; it is evident that it will be impossible to do justice to their efforts within the limits of a single article, and we shall acquit ourselves more profitably of our task by endeavouring to characterise the various tendencies displayed in these results of their studies.

The works of all the hundred and seventy architects may be classified under the following categories:—(1) Restorations; (2) Historical buildings and monuments; (3) Designs of buildings and monuments already executed; (4) Studies and plans for the restoration of ancient monuments; (5) Designs which will never be executed, consisting chiefly of imaginary studies by the young architects of our national training schools; (6) Designs which will be executed, having been already approved by the municipalities or other bodies at whose cost they are to be carried out. To these may be added the designs which are the result of great competitions open to all the world on some specially solemn occasion. Competitions are usually national or local, and are consequently only interesting to the architects of the particular district where the building is to be erected. Recently, however, the Italian nation, wishing to raise a memorial to the founder of her national union, called upon artists throughout the world to contribute designs. Those which were sent in by French artists attracted much attention; and it cannot be wondered at that they should submit to the judgment of their countrymen the drawings which had hitherto been inspected only by their Italian judges.

The real and incontestable strength of the French school of architecture is always manifested in the same direction,—that of archaeological restoration. Her special excellence in this line consists, as is natural and legitimate, in the knowledge and reproduction of national epochs and styles. Vitet, Viollet-le-Duc, Lassus, following Albert Lenoir, M. de Caumont, and Merimee, devoted their lives to the preservation of our national monuments from ruin. They have been succeeded by others worthy of themselves, and the *Société des Monuments historiques* leads public opinion in France in all that relates to this subject.

The exhibition contains no fewer than one hundred restorations or designs for the restoration of French monuments, either classed among the historical monuments, or belonging to individuals anxious to preserve or repair them, or to restore them to their primitive form.

Some of the drawings exhibited give only a representation of the existing state of the building in preparation for the study of the restoration; others show side by side with its former condition the building as restored; others again are only designs for restorations, or to afford a basis for an estimate of the cost to be borne by the owners of the proposed work.

The studies thus displayed illustrate every period of French history, and are of real interest as giving some idea of the wealth of

the country in this respect, and of the persistency of the national genius, thus marking its course from generation to generation, in spite of invasions and foreign influences. A view of the present condition of the Château de Melun sur Yèvre, near Bourges, recalls the time when, before France became a united kingdom, there was a king at Bourges, when the English held our land, when these towers or fortresses commanding difficult passes were alternately conquered and reconquered by the English and the French, until they were reduced to a condition of such ruin, that it is difficult to decide whether they should be restored or destroyed.

Among the most interesting of these restorations, as showing an intimate knowledge of the period treated, we may mention "La Châtellenie de Bourbon l'Ancien," by M. Gazez and M. Gélis-Didot. This is an example of the fortified dwellings of the Middle Ages, enclosed within walls, isolated on all sides by its height, and surrounded by water and deep ravines. Here we have illustrations of the civil, religious, and military architecture of two or three successive periods.

A great number of churches classed among the historical monuments, and of private châteaux, such as Chaumont-sur-Loire, Valencay, Gisors, Brissac, Azay le Rideau (made famous by Balzac), and Bourbon Lancy, have been restored by the architects of their respective departments, or are to be so, after designs here displayed. M. Corroyer, to whom we are indebted for the beautiful restoration of Mont St. Michel, shows the apse of the Cathedral of Dol in the Département Ille-et-Vilaine; and the successor of Viollet-le-Duc, the architect of the famous Château de Pierrefonds, near Compiègne, continues his master's work, and has at present in hand the paintings of the "Tour César," and the restoration of the interior of the castle left unfinished by M. Viollet-le-Duc.

The churches, priories, convents, and abbeys scattered over France, as well as the civil buildings, maisons de ville, &c., dating from the twelfth to the fifteenth century, engross much of the attention of our students of today; it would seem a sort of revenge for the neglect of the long years during which succeeding generations of French architects confined their studies exclusively to the works of antiquity. Of the hundred and seventy exhibitors here represented we have calculated that nearly a hundred have selected as the subject of their works the restoration of French monuments; we may further assert that not more than a dozen have remained faithful to Greece, Italy, or the monuments of antiquity. Among these M. Nenot, who has acquired European fame as the winner of the competition for the monument to Victor Emmanuel, has most resolutely thrown himself into that study of classical antiquity which has lost the power of attracting public attention. M. Nenot has chosen for his subject the restoration of the Temenos of Apollo at Delos; but we have reason to believe that had not a work of this nature been imposed upon him by the rules of the Académie de France in Rome, he would have turned his attention to a more modern subject. Accepting the opinions of Hittorf and Semper, M. Nenot has employed colour in every part of his restoration; he has undertaken the reconstruction of all that appeared to be indicated by a vestige of architecture or a fraction of plan, and, relying upon texts, he has replaced altars, statues, and *ex voto* offerings. His restoration seems, in all probability, to have passed the limits which should be set in respect of buildings too much ruined to be restored with absolute certainty.

By way of relief to so severe a study, M. Nenot exhibits an elevation on a very large scale of one of the bays of the front of the Certosa, at Pavia. Side by side with the classical simplicity of the Greek building, he shows us the most astounding accumulation of varied elements which can possibly be employed in the composition of a façade. We miss altogether the dignified balance of proportion of the Florentine buildings of the quattro-cento, and the judicious application of ancient forms to the necessities of a later age, which we see in the works of Brunelleschi and

Léon Battista Alberti; the Lombard architects make us feel by comparison the value of sobriety in architecture.

The period, now so popular, of the fifteenth century in Italy has again attracted a certain number of young architects. They are chiefly, of course, those who are travelling for the completion of their professional education, either having obtained the Prix de Rome, or having received a Government grant, as a reward for distinguishing themselves in our annual exhibitions. They are thus enabled, before beginning the practice of their art, to study the architecture of Italy, Greece, Spain, Flanders, and Germany.

Among such works as these we may distinguish a careful elevation of the curious monument of the Scaligers, so astonishingly preserved in that marvellous corner of the town of Verona, close to the "Volto Barbaro," and the "Signoria" of Fra Giocondo; a good restoration of the pulpits at Ravello, and a series of studies on the Palatine Chapel at Palermo, the Church of Toscanella, and the beautiful cloisters of Monreale. There is plenty of variety here, and a certain amount of curiosity mingles with the zeal which leads these young artists to seek their inspiration in foreign lands.

We would draw attention to another attempt, which is probably the first of its kind which has been made. This is an exhaustive study of the charming little oratory of "San Bernardino di Perugia," built about 1470, upon the Piazza della Justizia, at Perugia, by Agostino di Duccio.

In one particular this building is unique of its kind. Many of the artists of the fifteenth and sixteenth centuries combined the professions of painter, architect, goldsmith, and sculptor; but they usually practised each of these arts in its turn, and it is rare to find the architect carving his own facade. In this case the artist, whom Vasari calls Agostino della Robbia, but who was really Agostino di Duccio, designed his facade, made his bargain with the stewards (*provveditori*) of the convent, brought his marble to the spot, and put in hand at one and the same time both the building and the innumerable bas-reliefs which form its decoration. M. Laffille has appreciated to the full the interest attaching to such a work, which is also of special value, as being one of those rare buildings coloured after the Greek fashion; that is to say, the colouring is not natural, and due to the juxtaposition of different materials, but artificial; in fact, the building is painted. This elevation has been purchased by the State, and presented to the Ecole Nationale des Beaux Arts.

The original designs exhibited are of various kinds: some are architectural dreams destined never to be realised; others have been undertaken in the hope of their being adopted at a future time by some municipality or by the Government; while yet another class consists of those designs the execution of which has already been determined upon, and which are the result of an actual commission to the architect. It may be remarked that private enterprise in France is usually confined within the limits of private interests; thence it follows that the majority of the designs exhibited are concerned with general interests, being for churches, town-halls, schools, museums, or theatres, to be subsidised by the State or the towns in which they are erected.

We find, as was only to be expected, more than one architect attempting to solve the problem of the reconstruction of the Tuileries, and to work the new design into the whole group of buildings formed by the Louvre and the Place de Carrousel. The idea, which seems hitherto to have taken possession of the minds of all who have made the attempt, is that of a detached block of buildings on the exact site of the old Palace, connected with the Pavillon de Flore in the Rue de Rivoli and the Pavillon de Marsan, looking on the river, by an open porch giving access from its two sides to the vast quadrangle formed by the courtyards of the Tuileries and of the Carrousel.

We may instance, as a sign of the times, a reflection of the tendencies of the present day, the design (No. 4,178) by M. Trille, of Paris,

which he has entitled:—"Design for a house to be erected, sold, and inhabited by a group of workmen, making common stock of the forces of movement, of heat, and of light." This is a conscientious and practical attempt to combine the strictest economy with the simplest and most rational arrangements, and to provide for the equal partition of the various advantages intended for the good of the community.

There is nothing chimerical in this realisation of an ideal project; it is evidently dependent upon a degree of harmony and discipline which have not yet been attained by the ordinary French workman; but the mere fact that an architect has thought it worth his while to devote conscientious study to a plan of the kind, is an important sign of the times.

Another architectural curiosity will attract more attention from Parisians than from strangers to the capital. The celebrated novelist, Honoré de Balzac, whose life was one long dream, becoming possessed of wealth by a marriage more romantic than any he had imagined for his fictitious characters, resolved to erect for himself a sort of enchanted palace in the very heart of Paris. With this idea he purchased a well-known property at the corner of the Faubourg St. Honoré, opposite the Hôpital de Beaujon. The "Folie-Beaujon," then nothing but a ruin, had been the whim of one of those farmers-general of the last century, who set the example and the fashion in France of every sort of whim and luxury. The gardens were spacious, and some rooms which still remained witnessed to the grandeur of those which had disappeared. Here Balzac proposed to take up his residence. He died without having realised his dream, and as he only attempted to carry out his design by degrees, all that he actually accomplished was a part of the front looking on to the Faubourg St. Honoré. This is now a premature ruin, loaded with carving like a Hindoo temple, and puzzling every passing stranger to account for the curiously ruined condition of what is evidently a new building. Balzac's architect, M. Jules Monnier, who had devoted much thought and study to the proposed undertaking, invites the public to judge of his efforts by exhibiting drawings of "Balzac's House": as it was—*as it should be.* The great name attached to this design makes it incumbent upon us to notice it, although we do not profess to bring it forward as an example of good taste.

Competitive designs, as we have already said, keep their place in the Paris Exhibition, nor need we be surprised that they should do so. Many of these competitions represent a considerable outlay of time and thought to the architects; success crowns the efforts only of the chosen one among the many that are called, and we have here many designs prepared for contests too special to interest the general public, and requiring some degree of technical knowledge in those who pronounce an opinion upon them. Among these may be noticed several of the rejected designs for the monument to King Victor Emmanuel, among the most remarkable being those of M. Boitte and of M. Loviot.

The Diploma Competition, that is, the competition open to all the young architects of the École Nationale des Beaux Arts in Paris, who have already obtained a certain number of medals and certificates, and are candidates for the Government diploma, is represented at the Exhibition by several designs all on the same subject, "Designs for an Orphéon." We are of opinion, for our parts, that such designs as these should be kept within the circle for which they were primarily intended. The public is not sufficiently acquainted with the conditions and restrictions laid on the young artists, and the studies themselves, having no relation to the question of construction, are generally only more or less skilful adaptations, displaying beautiful draughtsmanship, but no evidence of the technical knowledge which alone makes the architect. The drawings exhibited are all various developments and applications of the works of Vitruvius, Scamozzi, and Palladio, made without any reference to their practical carrying out.

Only twelve architects, among all those who have actually constructed, either in Paris or

some other French town, buildings interesting to the public by their dignity of construction or wealth of decorative detail, have seen fit to exhibit their designs on these walls. The limited number of such exhibitors, most of whom are consummate masters of practical architecture, proves how completely absorbed they are in the constructive and practical exercise of their profession.

Performance is the test of knowledge, and the architect who builds has no reason to court the favour of the public by exceptional means. His work may be seen by all; it is there with its solid relief, its life, its openings for light which accentuate its features and bring forward its defects. His plan is brought to the test of everyday use, leaving no doubt as to the wisdom of his arrangement or the mistakes of which he has been guilty, and not all the charm of his designs, nor all the illusions of pencil or brush, can alter our opinion as to the actual result obtained. It may be observed that the majority of executed designs exhibited at the *Salon* are for hotels erected in Paris; it would seem that the object of the exhibitors was to induce those who inspect their drawings to entrust them with the execution of the dwelling-house which they may contemplate building in the future. This is legitimate enough: but it will be more prudent for those who are looking out for an architect to visit in person the particular habitation of which the designs are here presented under the seductive form of well-finished water-colour drawings. Nor should the intending client forget to inspect the "Bill of Costs."

The most important of all these mansions, one of the most imposing, indeed, in Paris, is that on the Avenue Friedland, designed by M. Reboul for Count Nicholas Potocki. The magnificent proportions of the building excite our admiration, but it is to be regretted that, in his design of the principal façade, the architect has made too frequent use of a style of architecture only suited to religious edifices, applying to a building for private use forms which long usage has consecrated to sacred art. The list of executed designs includes further some provincial châteaux of moderate dimensions, an Hôtel de Ville at Charny, a few private dwelling-houses on the Boulevard Malesherbes, and in the newer districts of Paris, and the new thermal establishment at Vichy intended for the use of the military.

It would be impossible in a single article to give any adequate description of an architectural exhibition; our intention in classifying the designs shown under different heads has been to give the reader an opportunity of judging of the tendencies of the age. The fact which most forcibly strikes us is the indifference to such exhibitions displayed by constructive architects. Putting aside the historical monuments, which have employed the pencils of most of the exhibitors, and the studies, properly so-called, executed by architects still at the school desk, we find that the "architect militant," the man who actually overcomes the difficulties of site, of material, of climate, and others that meet him at every turn, altogether declines to offer his works for criticism in the annual exhibitions. And, indeed, it is only too certain that, should the exhibitions become more serious in their nature, thus offering more attraction to first-rate architects, they would fall still further to rouse into enthusiasm a public wanting the knowledge necessary for correct judgment, and ready to yield to the charms of a showy drawing without any value whatever to practical men.

We may remark, in conclusion, that those designs which are submitted without any estimate of the cost of their execution are, to our minds, defective in a most important particular.

We all know that art has no limitations; its domain is universal, its aspirations are boundless; but a plan presented to us with any intention of realising it should be examined from a practical point of view, in order that we may ascertain that the author has made the limits of his aspirations coincide with those of the resources of the town, the association, or the individual who is desirous of executing his design.

Every design, not avowedly imaginary and ideal, to which the author has not affixed a careful estimate of the cost of carrying it into effect, wants a capital element. Some exhibitors, recognising this fact, have added an explanatory memoir to their designs.

DRAWINGS AT THE BURLINGTON FINE ARTS CLUB.

THIS, according to the Introduction to the catalogue, is the first of the Burlington Club Exhibitions in which any endeavour has been made to deal with architecture as a fine art. For this previous omission of architecture from the subjects of the Club exhibitions various reasons are adduced, not without force. It was contended that architecture, like sculpture, does not admit of full illustration without the help of solid form, as by models or casts; and, even assuming that the subject could be sufficiently illustrated by graphic art on a flat surface, the problem of classification was puzzling, as well as the necessity of separating the technical element from what properly belongs to the fine art which it is the aim of the club to cultivate. A quotation from the Introduction will best express how the committee of the Club have dealt with the subject on the present (we hope not to be the only) occasion:—

"Were we to take a historic view of the subject, a choice would have to be made between a system having reference to the buildings themselves, and one which concerned itself more with the artists who designed them. In the former case, to be at all comprehensive, no illustration would be possible, beyond the superficial, or merely elementary. If it be desired to confine ourselves to a single style, what style should have the preference? Some particular period might indeed be selected. For example, an adequate illustration of the successive revivals in recent times, first of Classicism, and afterwards of Gothic architecture, might have been attended with some profit.

"When, on the other hand, we endeavour to treat the subject in that sort of historic fashion above-mentioned, which gives to the architect the first consideration, it would seem reasonable to hope that, by means of a collection of original designs, some new light might be thrown upon artistic conceptions not always equally apparent in the buildings which have been their visible result. It was by this hope that the sub-Committee were mainly directed in their earlier inquiries. But impediments of various kinds were found to stand in the way of its realisation. Drawings of this kind by our earlier architects were difficult to meet with, and when they were known to exist, it was found that they were either deposited in public institutions, such as the Soane Museum, or that at South Kensington, where no power existed of lending them to a private society, or they were so bound up in books as not to be available for exhibition on the walls of a gallery. These obstacles rendered the designs of the earlier architects almost unobtainable, and it was not thought expedient to fill the gallery with the perspective drawings of the modern school, which it is the fashion to issue from the architect's office, dressed in gay and unreal effects by pupils and assistants.

"Sensible of these difficulties, and at the same time of the necessity of restricting in some way the wideness of scope afforded by the definition which had been adopted, the Committee deemed it their most expedient course to abstain from imposing, in the first instance, any severe limitation as to date, style, or purpose of building, except that the exhibition of works of living artists was (according to the recognised practice of the Club) forbidden; and to allow the character of the Exhibition to be in a great measure determined by the nature of the examples which might be found available for selection."

The result of inquiry as to what kind of architectural illustrations were to be had, led to the getting together a collection which, though mostly by architects, almost entirely consists of what may be called artists' drawings, in which the effective rendering of the expression of the architecture has been made the object. No distinction has been made between those artists who have been professional architects and those who were purely painters, "and one marked result of this collection is the prominence it gives to some of the former class, and the evidence which it affords how well qualified some of them have been to take a high place in the ranks of the latter." The artists represented include some architectural draughtsmen who did much good work, but whose names are now nearly forgotten. A few architects' designs which are more

purely professional in character, elevations, &c., of buildings intended to be carried out, are hung separately in the small room on the ground floor. The broad distinction is thus drawn between drawings which were an object in themselves, and those which were, like the majority of architectural drawings, only a means to an end.

Among these latter are what, to some people, will be, in anticipation, at least, the chief interest of the collection—twenty-four drawings, namely, by Inigo Jones, which have been collected from various sources. Two of these are perspective views of the great projected palace at Whitehall, of which only a fragment was executed; the remainder are mostly geometrical drawings, and hardly correspond with the reputation to which their author's name has attained. There is a "design for a palace," which is the most tame fine elevation that could be imagined; a rusticated basement, with a blank wall pierced by regular symmetrical windows over it. There are two or three others of the same type; one, of more originality and fancy, represents a geometrical elevation for a mansion of a Greek cross plan, with long arms,—a fine idea in itself, but it wants accentuation both at the extremities and the re-entering angles. Some designs for capitals show fanciful methods of working in figures, like some Renaissance capitals of which casts are in the South Kensington Museum; and there is one basket capital, apparently intended as a realisation of the old story of the origin of the Corinthian capital. The things which give most the idea of genius, however, are some very roughly-made drawings of architectural vistas for scenic effect; one of these (284) is a very fine and striking idea, a vista of pilastered walls with figures above, and terminating in an open, circular temple. Another (281), is interesting, as showing a gothic pavilion in the centre as the termination of the vista, the architect returning for a moment to his earlier tastes, for Jones only embraced the classic faith when he had arrived at a certain age, and became the first to introduce the new style in England. One of the designs made for the west front of old St. Paul's (200), is shown, and a terrible piece of work it is. Nos. 294 and 295 are rather amusing, one being an original rough sketch by Inigo Jones for a screen at Winchester Cathedral; the other Kent's working up of the same for the illustrations for his book. In this case Kent seemed to have thought the master's ideas required pruning, for he has omitted the acroteria which Jones had sketched over each column.

Leaving, for the present, this more strictly architectural collection in the lower room, we find in the large room a remarkable array of drawings, to which we shall not attempt to do justice in the limited space available in our present number. The drawings are broadly grouped into classic and gothic subjects, on the left and right hand walls, respectively, on entering. The very first drawing in the catalogue is by J. J. Scholes, who died as lately as 1863, but "travelled in the east in 1822"; the drawing is a large view of the Erechtheion, showing its condition after the first siege; a heavy but careful drawing in a brown tint. This is the drawing of an architect without much feeling for artistic effect, and forms, in this respect, a foil to the beautiful water-colour and sepia drawings of C. R. Cockerell. These include a study for the restoration of the Mausoleum at Halicarnassus, according to the idea published jointly by Mr. Newton and Professor Cockerell in the *Classical Journal*, 1847; this was exhibited at the Royal Academy in 1859. There is also a beautiful drawing of the restoration of the Theatre of Pompeii (7). Especially good is the view of the Acropolis, with the columns of Jupiter Olympius in the foreground; the latter in reality make the value of the drawing; the drawing and shading of the capitals and columns is the perfection of clear, clean architectural delineation, not destitute of artistic effect. A drawing of Sir C. Barry's shows the Erechtheion from the south-west. It is curious to compare

with the architect's drawings the bit of the Parthenon by Müller (17a); he shirks the architectural detail, and gives the composition and colour effect. Another drawing of his shows the caryatid porch of the Erechtheion from the interior—an unusual view. Here again effect is the object, and the world-renowned statues are poorly drawn and deficient in dignity. Stuart's drawings in some instances afford an interesting comparison with those by Scholes made at a later date, the Temple of the Winds and the monument of Lysicrates appearing sadly despoiled and defaced during the interval. His drawing of the Lysicrates' monument shows what seem intended for considerable traces of decorative colour, seen in no other view of it. Stuart's drawings are, however, very inferior in artistic quality to many of the others; they show audacious colouring and ill-drawn horses, and are altogether a much more commonplace performance than Cockerell's for example. Two masterly drawings by the latter are the Temple of Segesta, half seen over the brow of a hill, and the Temple of Neptune at Pæstum, showing admirably the effect of the heavy Doric order with its widely-spreading capital. His "Restoration of a House in Pompeii" (39) is far short of the piquancy and contrast in colour which the original would have presented. "A Poet's Home in Pompeii" (38) is a very pleasing interior effect. His large drawing, "A Tribute to the Memory of Wren," which has been engraved, and used to hang in the place of honour in the offices of architects who retained the traditions of the early part of the century, is hung over the fireplace, and is a brilliant piece of architectural draughtsmanship. By Sir C. Barry there is a rather heavy water-colour of the Great Hall at Karnak, and a careful pencil drawing of the two obelisks then at Luxor. Sir Digby Wyatt's rather large view of the Arch of Titus (32) is an admirable architectural water-colour, truthful and yet free in handling. Prout's interior of the Basilica of Constantine (31) impresses one, in comparison with this and with Cockerell's drawings, as decidedly mannered,—the result of a preconceived notion of effect rather than a genuine and truthful representation. David Roberts's fascinating drawing of the gateway of the Temple of the Sun Baalbec, is a little open to the same charge, but the style is a more refined one. This is interesting also as showing the displaced block of the lintel before it was propped up. One or two drawings by Sydney Smirke, notably a restoration of a Doric temple, show what an easily-earned reputation was his; they are simply wretched. We shall return to this exhibition at an early date; there is much more to note in it.

NOTES.

THE Committee on the Parks Railway Bill seems likely to elicit an interesting body of conflicting evidence. Sir John Hawkshaw, after insisting on the perfectly innocuous character of the proposed ventilating-shaft in Edgware-road, on being asked if he would like one near his own house, admitted that "he could not say he would like it." Among the objections to the railway are that it would set the watches wrong in the Edgware-road shops, and would remove the houses of two members of Parliament, which the members in question are unpatriotically averse to. The tradesmen in Edgware-road and the adjacent portion of Oxford-street would be much incommoded and even injured during the operations, but, asked counsel for the promoters, "was the convenience of a few tradesmen to be set against a great public improvement?" A question not to be asked. Sir John Hawkshaw described how he would ventilate the tunnels by engines setting circular fans in motion. Other witnesses have questioned the efficacy of this method of ventilation, and the First Commissioner of Works has stated distinctly that if it appeared that the ventilation after all would not be complete without ventilating-shafts at intervals, he should on that point withdraw his support. Lord Randolph Churchill gave

evidence strongly against the promoters, contending that the state of Cannon-street (and Aldgate, we may add) showed what was to be expected during the course of the operations; that the ventilation scheme was experimental, and if it did not answer, that Parliament would almost be compelled to grant additional facilities for ventilation if necessary for the working of the railway. In this we believe Lord Randolph is right; even adverse public opinion would hardly permit of the line being closed and the trains withdrawn when, once in working order, and it therefore behoves us to know well what we are doing first. Mr. Beresford-Hope said his house was an old family-residence, and no money compensation would atone to him for having to give it up; and certainly we sympathise with Mr. Hope. Mr. Cooper (civil and mechanical engineer) and Dr. Corfield gave evidence against the idea that the proposed scheme of ventilation would be sufficient. In all this there is matter for serious reflection. A remark seems called for in regard to the argument of the counsel against the Bill (Mr. Rodwell), who observed that, though it was claimed that this was a great public improvement, not a single member of the public had been called in evidence to show this; and Lord Randolph Churchill made a similar remark in his evidence. The actual fact, we take to be, that the persons for whom the railway would really be a convenience, are the mass of people who cannot afford carriages or cabs, and the evidence of such witnesses singly would not have much weight against that of well-known public men. But to deny that there would be any public advantage or convenience in a short cut by rail from south to north of London is simply ridiculous. It is very much wanted; and Mr. Beresford-Hope's "amazement" at the proposition is only another instance of the curious incapacity of those who can afford private vehicles to realise the wants of those who can afford nothing but the cheapest public conveyance. The fact that a north and south line is wanted is obvious to every one who travels on the underground lines of railway; the question is whether it is right, or in the best interests of the public, to make it under the parks: a question which ought to be seriously considered.

OUR recent remarks as to the importance of the building trade in the United Kingdom are illustrated by the second volume of the census of the United States for 1880, which enters much more into financial details than is the case with our own census returns. For "carpentering" in the year 1879-80, the sum of \$4,916,416½ was paid in the States; for brick and tile products, 2,144,595½; for marble and stone work, 2,047,777½; for sash-doors and blinds, 1,708,186; for lumber, planed, 1,178,145½. The above figures, which we take from a paper by Mr. Charles Eason, read before the Statistical and Social Inquiry Society of Ireland on April 28th last, amount to 11,995,118½ for labour only, the net value of the above items being stated at 28,323,940½. The item of blacksmithing, the labour on which comes to 2,025,200½, of course only partially applies to building purposes; but, on the other hand, many items, such as paperhanging, are omitted. And "lumber sawed," which must chiefly apply to building, amounts to 17,422,669½ for net value, of which 6,369,195½ were paid in wages. If we take credit for the whole of this last item, by way of compensation for unspecified industries, we have a total of 45½ millions sterling spent in the United States in a year's building, against 35½ millions in the United Kingdom. The number of hands employed in manufacturing industry has risen from 958,079, in 1860, to 2,732,595, in 1880, and the average yearly wage per hand from 49½. in the former to 69½. in the latter year. The "net value of the products of the manufacturing industry" of the United States in 1880 is given as 92,787,059½, and the "net value of the products of all manufactures" in the same year at 394,551,128½. Of cotton goods produced in the States the net value for the last-mentioned year is stated at 19,436,969½, 47½ per cent. of which was paid in wages.

THE Channel Tunnel Bill was thrown out, on Wednesday, at the second reading by a majority of 138 (222 to 84), a result which might be regarded as a foregone conclusion. It is to be feared that the "Honourable Baronet" who moved the second reading hardly appreciated the force of Mr. Chamberlain's account of the correspondence between him and the Board of Trade on the subject of his undertaking to stop the works in compliance with the requisition of the Board, and the manner in which his promise was carried out. Most men would feel rather hurt at being publicly told three times in an evening that their word could not be trusted; but this is, perhaps, an antiquated prejudice.

THE meeting of the Hellenic Society, held on Thursday, May 8, was of unusual interest. Mr. J. Theodore Bent, who has just returned to England after a six months' stay among the Cyclades, read before the Society a paper giving a short sketch of the results of his explorations. The reward of his labours has been ample. The interest of these islands proved to be fourfold, for remains were discovered of prehistoric times, of the great days of Greek ascendancy, of Roman rule, and finally of the power of the Crusaders. Mr. Bent further pointed out that these islands were a storehouse of still-surviving Greek customs, which, through contact with foreign races, had become obsolete on the mainland. It is, however, in his discoveries of prehistoric tombs that Mr. Bent has been conspicuously fortunate. The pottery he has brought home, some of which was exhibited to the Society on Thursday, would seem to be even more primitive than that discovered by Dr. Schliemann at Hissarlik. Some very rude early attempts at modelling the human figure were also shown. Full particulars, it is hoped, will appear in the Society's Journal; and it is much desired by all archaeologists that Mr. Bent should extend his investigations to the islands of the Sporades.

The discussion on Mr. Spiers's paper at the Conference, as well as the paper itself, contained a great deal which is of much practical interest. The relative characteristics of French, German, and English education were well brought out; the German, characterised by one speaker as a "schoolboy system," where everything was cut up into lessons, with a chilling effect upon special talent and genius; the English where a pupil might learn a great deal if he liked, but on no system, and with too often little to thank his so-called master for; and the French *atelier* system, which really formed a little school round each eminent architect. There is one delightful piece of unintentional satire in the question asked,—"as a French *chef* asked no premium with any pupil who had received a prize or a medal, "What was his object in keeping an *atelier*?" We fear too many architects in England would sympathise with the question. In France, it was explained, they think more of *la gloire*, or, in other words, of having a following of clever young men who look up to them and carry out their school of work. We heartily wish there were more of the same feeling in this country.

THE famous terra-cottas of the Sabouroff collection have gone to St. Petersburg. The less famous, but more interesting, original marbles remain at Berlin, where they will shortly be shown to the public. Of special interest is the Sparta grave relief, one of a class of monuments familiar to archaeologists as illustrations of the translation of wood technique into stone. A veiled female head attracts attention by its close analogy to our own Demeter of Cnidos; it is, however, of inferior execution. Two stone maidens, nearly life-size, have evidently some time stood as mourners on some Athenian tomb. Several Athenian grave reliefs, one surmounted by the customary "Sirens twain," should also be noted. Berlin has long been noted for its bronze "Praying Boy," but the Salamis bronze of the Sabouroff collection is of far higher

workmanship. It is the votive figure of a standing athlete. The vase collection of the Berlin antiquarium has also received important additions from the Sabouroff collection. Among them we noted specially a pyxis, or ointment-box, decorated with the "Judgment of Paris," in fine, delicate drawing of the fourth or late fifth century, B.C. Two Athenian vases, of extraordinary beauty, the one representing groups of Mænads and Satyrs, the other a toilet scene. Two black-figured vases, adorned with the "Death of Priam." Some of these are already known to archaeologists, through Dr. Furtwaengler's publication of the Sabouroff collection. The two last-named have yet to appear.

THE interest of the German Government in the results of the Olympian excavations is now, unhappily, somewhat blunted by a natural enthusiasm for the more recent and far more sensational discoveries at Pergamos. To the archaeologist, however, the work that is going on in the Olympia Cast Museum is still the centre of his chief interest. The restoration of the Eastern pediment (that attributed to Pæonios) is approaching completion. It is expected that in June it will be finished. In its complete state it will then be raised to a considerable height, when its effect as a composition can be much better judged. Funds for a similar restoration of the Western pediment (of Alkamenes) are not yet voted, but it is scarcely possible that a work so splendidly begun should be left incomplete. At the end of the Olympian Museum stand small models on a scale of one-tenth of both Eastern and Western pediments, with full architectural restorations. Each little figure in these models is movable. It is an interesting sight to see Dr. Curtius shift them to and fro to elucidate and confirm his own particular theories of their relative positions. It is the hope of archaeologists that ultimately both fronts of the temple will be rebuilt of the original size.

WE give elsewhere the programme of the intended proceedings at the Conference of French Architects to be held next month at Paris. In a letter accompanying the programme, M. Questel, the President, invites particular attention to the idea started at the Nice Congress recently, of the formation of a permanent Body (*Caisse*) to give support to members of the profession in upholding professional interests, and also to the important question of public competitions. Some of us may have information both to give and to receive on these subjects.

THE drinking-fountain which has lately been opened, with much pomp and circumstance, on Hackney Downs, will, doubtless, afford refreshment to many a parched traveller over that arid waste, but in itself it is far from being a thing of beauty. Conspicuous it must needs be, for it stands on the ridge of a treeless desert,—a stunted monolith, whose only feature is an inscription recording the virtues of an otherwise unknown (but worthy) citizen. It is a pity that so good an opportunity should have been lost for imparting beauty and freshness to sixty of the dustiest acres in suburban London. Probably the monster squirts in Trafalgar-square, with their slopky basins, have prejudiced the public mind against ornamental fountains, and it must be admitted that there are few sites in London where one could listen undisturbed to the cadence of falling water. Hence, perhaps,—if not to the utilitarian spirit of the age which sees more sense in a pump than in a fountain,—the latter has gone out of fashion. Elia long ago lamented the disappearance of this refreshing object from the nooks and corners of old London. Some were dried up; some bricked over; nearly all gone. He recalls the time when, in Lincoln's Inn-Fields, "four little winged marble boys used to play their virgin fancies, spouting out ever fresh streams from their innocent wanton lips." They were voted childish, and therefore removed. But, he asks, "why not gratify children, by letting them stand? Lawyers were children once."

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

ONE commendable feature in the present Exhibition is the prevalent appearance of the draughtsman's name on the several exhibits. It is not every architect who has the skill, or the time, or the inclination to prepare an Academy perspective of his work. With one or two exceptions, it is well known that for such assistance the prosperous architect seeks the aid of experts in draughtsmanship of the special kind required. But, until quite lately, the expert in question was left studiously in the background. The more clear an architect's claim is to the credit of the design, the more he can afford to allow due credit to the subordinate artist who enables him to bring it in fitting guise before the public. It is a manifest injustice to employ for this purpose such accomplished draughtsmen as Mr. Langham, Mr. Lethaby, Mr. Groom, and others equally well known, and to engross the credit due to their talent. Accordingly, we see with satisfaction that it is becoming the custom for the more important architectural drawings to bear the name of the draughtsman as well as that of the responsible architect, and that the means of apportioning the respective share of each in the result are provided for the spectator.

"The Temple of Diana at Ephesus, from the remains discovered by J. T. Wood, restored by James Fergusson" (No. 1,341), is by far the most learned work in the Exhibition. A plan accompanies the drawing, but it is without explanatory references. We assume that the darker portions represent Mr. Wood's discoveries, and that the lighter-patched portions are the conjectural completion of the design. If so, Mr. Fergusson may be looked upon as the Professor Owen of Archaeology, for never did that learned naturalist construct a specimen of an extinct species of animal from more inadequate data. It would have been interesting to learn how much of the embellishment of the temple is purely imaginary, and how much (if any) is warranted by precedent. It is observed that of the columns in the Pronaos, some are stilted upon pedestals and some have their bases on the ground, though all the columns are of the same order, and apparently of the same diameter. If the arrangement is warranted by Mr. Wood's discoveries it is peculiar, and would prove, we should think, rather unsatisfactory in effect. The steps at the base of the building are all shown of a practicable rise and differ from those in other Greek temples where the height of the step had a relation to the order and in which special subdivided narrow flights were accommodated to facility of ascent. Allusive sculpture is introduced in prodigal profusion, in the Tympanum and on the Acroteria, in friezes and around the lower portions of the columns. Such a drawing from so renowned an authority requires a pamphlet to illustrate and explain it, and in its present condition leaves the beholder in the dark as to the real part played by its author. The drawing is elegant and conscientious. The portions which cut against the sky are without the solidity which they would assume in nature, and it gives a more or less technical representation of the building rather than a realistic one. It is quite free from all trick and subterfuge of draughtsmanship, and is one of the most attractive drawings in the room.

"A Design for an Academy of Arts," Edwin Geo. Hardy (No. 1,282). This drawing obtained the Academy Gold Medal and Travelling Studentship, and it is the more interesting on that account than for any special excellence of design or draughtsmanship. Without seeing the whole of the illustrative drawings, it would be unjust to impugn the decision of the Council, but we doubt whether the highest Academy distinction was often obtained upon a slenderer performance. The design is severely Classic. A lofty Corinthian order is raised upon a low and somewhat common-place basement. The main façade has a centre, projecting wings, and connecting curtains. The curtains and flanks enclose, presumably, the galleries, and are mere blank walls. The central block is raised by an apparently useless cloistered court, and all the parapets are surmounted by obelisks—singly or in pairs—some 10 ft. or 12 ft. high. The windows on the principal floor are squat and ill-proportioned for so ambitious a style, and the detail throughout is not of the first quality. It is, perhaps, unfair to criticise too severely the work of a student, but one must be cruel only

to be kind. The drawing is apparently accurate, so far as can be judged in the absence of a plan, and if it is destitute of feeling, it is free from the blemish of all affectation and display.

Nos. 1,267 and 1,324, by E. J. Milner Allen and Leonard Stokes respectively, are rival designs for the same subject. Of the first nothing need be said beyond a word in praise of its breadth and simplicity. It is hung too high for an examination in detail. The latter is, however, a fine design, evidencing very considerable skill in composition, and a nice feeling for proportion and detail. It is of a Lombardic type—very suitable, as we think, for the object. An arcuated lower story is deeply recessed, and statues are effectively disposed in isolated groups under each arch, and well thrown up by the dark background. The upper storeys are windowless; but their surfaces are diversified by deep friezes sculptured in relief, and on the lower lines of parapets single statues are ranged. Cupolas crown each angle of the structure, and the centre is marked by a lofty dome of graceful contour. Such a design carried out in brick and terra-cotta would have an imposing effect, and be not only architecturally excellent, but eminently fitted for its purpose. This drawing is also out of the range at which its minor parts can be appreciated, but it looks all in proper scale and satisfactory in point of detail.

"Design for Nottingham Municipal Buildings," by F. H. Oldham (No. 1,292). This design was, we believe, placed first by the professional assessors, on the score of its excellent architecture, and it no doubt merited the distinction. The ensemble is certainly striking, although some of the details are a little too free and bizarre for perfect dignity and suitableness. The tower is so extravagantly lofty as to suggest the exercise of an ambitious student unmoved by the fear of contractors, rather than a sober, practical proposal; and, unfortunately, the detail of this too prominent feature is almost the weakest in the composition. The huge clock faces throw the whole out of scale, and are, moreover, bordered by some very indifferent ornament. A series of bells are hung in niches flush with the outer faces of the tower, with an upper tier disposed in a kind of dormer, while the whole is crowned by an empty turret. Here and there an attached order interferes with the integrity of the constructive scheme, and a very singular arrangement of sparse quoins at the tower angles resemble nothing so much as the angle iron bands on an American travelling trunk. The general grouping is extremely artistic, the skyline varied and pleasing, and with that careful revision which the test of working drawings and estimates would necessitate, this design would, if executed, provide Nottingham with a municipal building of which it might be justly proud.

"The Central Station Hotel, Glasgow," R. Rowand Anderson (No. 1,313), presents a singular combination of styles which give a result very difficult to name. Round, arched window-openings in the lower stages are filled in with a sort of Venetian tracery, while the upper storeys are unadorned; Francois I., "Queen Anne" gables and dormers, and a nondescript tower complete the incongruous medley. The chimney-stacks just peep above the roofs, and thus a chance of imparting some interest to an otherwise tame and spiritless sky-line is lost. The design is not up to the author's mark, and is in many ways weak and unsatisfactory.

"Edinburgh University Extension—New Medical School" (No. 1,236), by the same author, is a design of a very different calibre, and has previously received our hearty appreciation. It is a temperate and well-balanced study, and, assuming some justification for the very lofty campanile, looks appropriate for its purpose.

"A Design for the Staircase of a Royal Palace," E. W. Foley, No. 1,293, is every way creditable to the author. The architecture is of a strictly academic type, and good of its kind. The drawing is in simple line, unadorned by artifice, and apparently in absolutely true perspective. The figure drawing and ornament are noticeably excellent, and the whole is marked by patient skill and honesty of purpose.

"New Roof to the Area of the Royal Exchange," Charles Barry, No. 1,335. A bright and highly-coloured drawing, shows an iron and glass roof, which has nothing very notice-

able about it. It will no doubt fulfil its function of keeping out the rain, and the eager speculators who will be thus sheltered from the elements will probably be too much engrossed in their absorbing pursuits to care to inquire as to the æsthetic value of covering which assists to keep them warm and dry. A practical want has been met in a practical way, and nothing more about it need be said.

BLACKFRIARS AND BANKSIDE.

SOME OLD THEATRES AND A NEW RAILWAY.

Publius, student at the common law,
Oft leaves his books, and for his recreation,
To Paris Garden doth himself withdraw;

Leaving old Plowden, Dyer, and Brooke alone,
To see old Harry Hunks and Searson.

Six JOHN DAVIES'S Epigrams.

The approaches to the second railway-bridge now being built over the Thames at Blackfriars will pass over ground which is consecrated to the memories of our three greatest playwrights, —Shakespeare, Jonson, and Massinger. The northern abutment rests against Water-lane and Playhouse-yard; the southern by Falcon Dock and Paris Garden-stairs. In a bird's-eye view of Bankside, made during Queen Elizabeth's reign, and which corresponds in many points with Agass's map and Braun and Hogenberg's view of 1572, "olde Paris Garden-lane" leads from the stairs to the Cross (northern side of Holland-street). Parallel to, and a few yards east of, the lane flows a cutting to "the Mill and the sine of the Gates in the Libertie of Old Parris Garden." Just north of the Mill (Wid-fleet Mill) and the Gates appears "the Folken Ine in the Clinck Libertie"; immediately southwards are "the Mill Pond" and "the waye leading to Copt Halle" (Vauxhall). From the Mill-pond in a south-easterly direction is "Graville-lane leading to St. George's Fields." Between the Pike Ponds and the western wall of Winchester Park stand the "Bowl Baytyng" and the "Beare Baytyng." The respective sports are clearly delineated within the two arenas, together with the dogs and their kennels and the ponds for the bears. Immediately westwards of the South Metropolitan Gas Works, near Phoenix Wharf, is an open space vacated by the removal of Meredith's Sawmills to Belvedere-road, *antiquo* Narrow-wall, Lambeth. This is the site of the royal Pike Ponds, which are yet commemorated by Pond-yard and Pike-gardens. James Newton & Sons' Tile Works, Nos. 78-9, Bankside, represent the Falcon Tavern at the foot of Falcon Dock. The adjoining premises of the General Hydraulic Power Company are reputed to have been occupied by Wren when engaged upon rebuilding the City churches. Messrs. J. & G. Remie's Albion Iron-works have replaced Widfleet Mill, whilst the Mill Pond has been succeeded in turn by the Falcon Glass-works (the late Mr. Apeley Pellatt's) and the existing cocoa manufactory of Messrs. James Epps & Co., Nos. 45-61, Holland-street. Maid or Maiden lane, and Deadman's-place, are incorporated in Park-street. Rochester, Winchester, Park, and Sumner streets remind us of two episcopal palaces which once stood in Bankside, and of a late occupant of the latter see. The Anchor Brewery (Messrs. Barclay, Perkins, & Co.'s) and Pott's Vinegar Works cover portions of Winchester Park; Southwark Bridge-road appropriates the Castle-lane that took its name from one of the forts of Sud-werke, the south work of London. The embankment of this quarter is believed to date from a Roman age. Here was an important military station of that period, with its cemetery in the modern Devereil-street, a turning out of Warner-street, New Kent-road. Stoney-street, joining Borough Market to Clink-street, and Stoney-lane, Tooley-street, mark the course of a causeway that communicated, by the ferry, with the Walling-street at Dowgate.

The building of a regular play-house in London dates from 1570 or thereabouts. Before the year 1580 the Blackfriars and Whitefriars theatres were in existence as "private houses." These, together with The Theatre and the

* From the open space at foot of Falcon drawing-dock radiate the three arms of Holland-street. The western arm, which led to the ill-famed "Leaguer," is cut off by the railway station; the southern arm, that leading to Copt Hall, was formerly Green-walk; the south-eastern (the Graville-lane of the plan) runs past Hopkin's Almshouses to Sumner-street. Sumner-street absorbs both the former Miles's-walk and northern portion of Gravel-lane. † From an early period Southwark was famed for its glass-houses. Here were made the windows for King's College Chapel, Cambridge.

Curtain, both in Shoreditch; the Fortune, built by Peter Street, a carpenter, for Edward Alleyn and Philip Henslowe (1600), in Cripple-gate-without; and the Red Bull, in Aylesbury-street, Clerkenwell, are the earliest houses. In 1574 Queen Elizabeth, ever a warm patron of the drama, licensed James Burbadge and four others, servants to the Earl of Leicester, to exhibit all kinds of stage plays "as well for the recreation of her loving subjects as her own solace and pleasure when she should think good to see them." Ejected from the City, Burbadge's troupe settled within the Blackfriars precincts, on a spot which lies between Apothecaries' Hall and the south-western corner of St. Anne's Blackfriars-churchyard. Here, in 1586, the company was joined by Shakespeare, then twenty-two years old, who, as some will say, had begun his career in London as a link-boy and horse-minder in attendance on visitors to The Curtain. Within three years he was assigned one-sixteenth as his share of the Blackfriars property. A winter house from the beginning, that is to say, a house covered with a roof, and adapted for artificial lighting, the Blackfriars was extensively repaired in 1596. The then nine partners had petitioned the Privy Council for its concurrent enlargement, but the authorities, daunted by the Corporation's opposition, refused this further favour. Shakespeare then lived at Bankside, near Bear-gardens.

In the year following (1598) he purchased New Place in his native town for the sum of 60*l*. This same year, too, is memorable for his first acquaintance with Ben Jonson. The latter, ten years his junior (and who also is said to have started as a player at The Curtain), was at this date miserably poor, though as well known as Shakespeare himself, perhaps better. He was intimate with Alleyn and Henslowe, familiar with Drayton and Chapman, with Rowley Middleton and Fletcher. Already had Meares celebrated him as one of the principal writers of tragedy: he had long been rising, says Gifford, in reputation as a scholar and poet among the most distinguished characters of the day. His "Every Man in his Humour" had been performed, says Henslowe, eleven times between the 25th of November, 1596, and the 10th of May succeeding.* Dedicated to Camden, his old master at Westminster, the prologue opens with the lines:—

Though need make many poets, and some such
As art and nature have not better'd much;
Yet cure for want hath not so loved the stage,
As he dare serve th' ill customs of the age;
Or purchase your delight at such a rate,
As, for it, he himself might justly hate.

Here, it is well said, we see how ennobling an idea Jonson had already formed of the true and dignified office of the Dramatic Muse; whilst he invariably supported, through every period of his chequered life, the lofty character with which his youthful fancy had invested it. The scene of the play, as originally acted at the Rose, lay in Florence. Its success induced Jonson to recast it by transferring the scene to London, and altering the *personnel* from Italian into English. In its amended shape the comedy was acted for the first time at the Blackfriars Theatre in 1598. At the head of the *dramatis personæ* stands Shakespeare's name, in the character of *Knave*, an old gentleman. Retiring to Stratford-upon-Avon, Shakespeare maintained his connexion with the field of his labours and profits by purchasing (10th March, 1613) the premises "in the Blackfriars in London nere the Wardrobe," which, thus described in his will, he bequeaths to his daughter Susannah Hall. The year after his death we find Edward Alleyn, of the Fortune, taking a lease of the Blackfriars house. For some years the company resisted the rancorous Puritans, who cared for nought but their own sad "Drolls"; but they had at last to succumb; for on the 6th of August, 1655, the property was pulled down. Within a few months the name even of Playhouse-yard will, in all likelihood, have disappeared for ever.

In the same year (1593) that John Harrison first published "Venus and Adonis," at the White Greyhound, St. Paul's-churchyard, the Blackfriars company established themselves in an additional house,—the Globe, Bankside. Here, five years later, they made substantial improvements, for which Richard, son to James, Burbadge contributed the materials of the Curtain at Shoreditch. Richard Burbadge, whose portrait hangs in the Dulwich Gallery

* The earliest play that can be unhesitatingly ascribed to Jonson, who wrote it before attaining his twenty-second year, was first printed 1611, in fo.

we may observe, was celebrated for his performance of the chief part in "King Richard III.," which tragedy, with that of "King Richard II.," was written, and produced at the Globe, in 1591.

We have thus reached the place and time of Shakespeare's, Ben Jonson's, and Massinger's chiefest triumphs. At the Globe and Blackfriars Theatres all of Shakespeare's pieces,—himself an actor in some,—were produced. Massinger's "The Picture" (1629) and "The Emperor of the East" (1631); Ben Jonson's, "The Poetaster" (1602) and "The Alchemist" (1610), so long the favourites with the town, came out at the Blackfriars, as also his "Magnetic Lady" (1632), "The Case is altered" (1598), "The Devil is an Ass" (1616), and the "Tale of a Tub," his latest (1633). From his house in Blackfriars he dedicates "The Fox" to the sister Universities. This matchless work was first performed at the Globe (1605), where, too, were produced, "Every Man out of his Humour" (1599), and "Sejanus" (1603), in which latter Shakespeare took a part. Of Massinger's plays, when first brought out on the Blackfriars stage, should be cited "The Fatal Dowry" (before 1620), "The City Madam" (1632), "The Guardian" (1633), "A Very Woman" (1634) "The Bashful Lover" (1636), "The Roman Actor" (1626), and "The Duke of Milan." Jonson's exquisite masques and entertainments earned for him the tardy recognition of King James I., in the year of Shakespeare's death. Nor did Shakespeare's claims pass unwarded, for one of that sovereign's first public acts was the granting a patent, dated at Westminster, 19th May, 1603, to him, in conjunction with Laurence Fletcher, Richard Burbadge, Hemming, and Condell, "freely to use and exercise the arte and faculty of playing comedies, tragedies, &c. . . as well within their nowe nassall houses called the Globe, within our countie of Surreye [and elsewhere]." With Massinger dramatic poetry ended her reign; nor did the stage itself long survive him. As with the deprecatory lines on the whitewashed bust at Stratford-upon-Avon, so with the four immortal words inscribed upon the little stone in the northern aisle of West Minster, may be compared the touching entry which records his burial at St. Saviour's, Southwark.†

Where then stood the Globe, which Ben Jonson terms "the glory of the Bank and fort of the whole parish," and which, with the other playhouses, are so prominent in the Antwerp and Hollar's views of London? For the Globe some would claim with Chalmers a site, that of the former "Welsh Trooper," close to the riverside, between what are now the northern ends of Pond-yard and Emerson-street. Yet most writers affirm that it was situated in what is now the north-western angle of the Anchor Brewery (covering Thrale's business residence); that is to say, south of Park-street and west of Southwark Bridge-road. This opinion is supported by the existence there as late as 1799,—see R. Horwood's map,—of a Globe-walk and a Globe-court, and of a Globe-alley in 1808,—see Wallis's map. Jonson in his "Exercitation upon Vulcan," mentions its destruction by fire, which he witnessed. This was on June 29, 1613, at the discharge of a peal of ordnance during the performance of "King Henry VIII." It was speedily rebuilt, and finally demolished in 1644. The familiar term of Bear Garden is applied so generally that it is not easy to identify any particular building therewith. But looking at our plan the original Beare Baytyng stands just westwards of Horseshoe-alley, leading from Park-street to the Bankside, and the Bowl Baytyng corresponds with the Hope,—which occupied the now square in Bear-garden, where is still a tavern-sign of the White Bear. At the Hope the "Lady Elizabeth's servants"‡ first acted Ben Jonson's "Bartholomew Fair," so popular for its reflections against the Puritans (October 31, 1614). The Hope, so ill-recommended in the author's induction to that play, was pulled down

in March, 1656, having, like to its compeers in their decline, been wholly given up to the brutal exhibitions in which Harry Hunks and Sackerson, the very ill-favoured rough thing that Slender had seen loose twenty times, and had taken by the chain, played so ignoble a share. Hard by, a few yards eastwards, where is now Rose-alley, stood the Rose, probably the oldest of the group. It belonged to Henslowe, and had been originally constructed of wood and thatch. Paris, or Bear, Garden Theatre, and the Swan, lay to the west, the former being within the range of the new works. For his ill-success as an actor and particularly for having performed the part of *Zulimian* at the Paris Garden, Jonson incurred Decker's reproaches. The Swan took its name from tenements scheduled in a grant by King Edward VI. of the Southwark Manor to the City of London. Closed as a theatre in 1613, it lost its high repute in becoming the scene of pugilistic and similar exhibitions. Paris Garden commemorates the house and grounds of Robert de Paris, temp. Richard II. The Falcon presents a very sorry aspect in Robert Wilkinson's print of 1805. During last century it had served as a leading rendezvous for the Kentish and Surrey coaches. Hither would often repair Shakespeare, and his neighbour, Ben Jonson, to meet their fellow *hanc capitis*.—Beaumont, Fletcher, Selden, Cotton, Carow, Martin, Donne, with many others whom Sir Walter Raleigh had collected at the Mermaid in Broad-street.—"What things have we seen done at the Mermaid!" says Beaumont, on the opposite shore. On Bankside, too, may often have been seen a less joyous spectacle: that of Oliver Goldsmith in threadbare coat, vainly seeking as a medical practitioner to earn the poor livelihood from which he turned to press-reading for the author of "Clarissa," and an ushership in Dr. Milner's school at Peckham.

RESIDENTIAL PROPERTIES AND RESTRICTIVE COVENANTS.

Most of us are more or less familiar with those very common covenants which are found in many leases of buildings in London and other large towns, by which the lessee is prevented from using his house in any way which he may think fit. The object in such covenants is, of course, to keep properties as residential only, and not to allow them to become centres of trades or manufactures. One learned judge, indeed, seems to have regarded them from an artistic point of view; for it is stated in the judgment in a well-known case in regard to a covenant of this description that it "is framed only to provide uniformity in mode of building, so that the enjoyment which springs from regularity in a series of dwellings may be preserved." A good many persons would certainly be glad to give up the enjoyment of this "regularity"; if they could be sure that a publichouse or a baker's shop would not sooner or later become their neighbour. But as it becomes, as a rule, so fixed a condition of the property that it cannot be departed from. But this general rule is subject to an important exception, of which it is well that all owners of property and all those who are connected with the management of property should be aware in days when towns increase and localities change their characteristics with so much quickness. The exception was thus stated in a comparatively recent case by the late Lord Justice James:—"If, either by permission or acquiescence, or by a long chain of events, the whole character of the property has been either entirely or so substantially changed that the character of the whole place or neighbourhood has been so altered that the whole object for which the covenant was originally entered into must be considered to be at an end," then the covenant will not be allowed to enforce the covenant. The obvious reason of this is, that to try and enforce the covenant in question under such circumstances would, in truth, be nothing more than the harassing of the tenant, not for the general good of the property and of the dwellings on it, but simply for some selfish purpose.

The latest case on this subject is a clear illustration not only of the above rule but of the way in which these restrictive covenants may become obsolete, partly from the growth in a particular manner of certain localities and partly from an over-sanguine view of the prospects of the pro-

perty in the first instance. The land in question was situated at Leytonstone, and in 1877 the British Land Company, Limited, were the owners of a particular block of building land at that place. In this year the plaintiff through an intermediate person became the owner of this particular lease, and in 1879 the defendant became the owner of his house, likewise after it had passed through other parties from the Land Company. In the original lease by the Land Company there was the special stipulation that no building on the lot was to be used as a shop nor was any trade or manufacture to be carried on on any lot, and the sublease incorporated this restrictive covenant. The object or the hope of the Land Company, when the estate was first built on, was, to quote from Mr. Justice Pearson's judgment, that these houses should be occupied in the ordinary sense by separate owners of each house, so as to keep each house a private house for a private family. But during the few years which elapsed from the date when houses began to be built on this spot the date when houses were no longer let to private persons, each having one house, but the majority were divided between two families at rents of 6s. or 8s. a week, each family paying half such sum. During the same period shops were opened around the plaintiff's house, and among them was to be seen that of the defendant, which was a beer-shop with an off licence. Then in the year 1882 the plaintiff endeavours to prevent the defendant from continuing to carry on his business because he was thereby infringing the restrictive covenant in his lease. But, said Mr. Justice Pearson, "if I grant the injunction shall I be enforcing the contract in order to keep the property in the state in which it was intended to be kept when these stipulations were first put on this plan?" This crucial question to himself the judge promptly answered in the negative, on the ground that the contract into which the plaintiff had entered could no longer be performed for the purposes for which it was entered into. It would not be difficult from the cases which have been decided on this point to cull further examples exemplifying both the rule and the exception. But this latest case of *Sayers v. Collyer* sufficiently shows how the exception is to be worked, as well as the danger of causing tenants to enter into restrictive covenants of this kind before it is clear what the character of the property will eventually become. The short period which elapsed from the date of the erection of the houses to the date of the property becoming what may be, perhaps, called a miscellaneous one, shows that the original promoters of the buildings had quite miscalculated the nature of the property. Such a rapid change, if, indeed, it can be called a change at all, differs entirely from those alterations which may be seen in most large towns where a residential property has become more or less a shop property from the natural movement of events. In such a case as the latter one, however, it is advisable that both owners and tenants should clearly understand that their position in regard to restrictive covenants is distinctly changed by the force of circumstances.

Leyton Local Board.—The annual report of Mr. Dawson, C.E., surveyor to this Board, reports improvement in some particulars, with indications of a wish on the part of the surveyor for further improvement. Every sewer is now capped and every house connexion made by the Board's contractor, and not a single pipe is covered in without being inspected. The "great event of the year" has been the completion of the sewage works (of which we gave a description). "Nothing has been done to the private sewers" in certain roads, reported upon last year, and there are still many roads in the parish that require making up, and the surveyor points to the improvement in the letting value of houses in the roads that have just been finished, as an inducement to go further in the right way. There is "a marked improvement in the building materials now being used in the district"; there are still a few builders who give trouble and require much supervision, "but the worst of them have left the parish entirely." Very well for happy Leyton; but to what other parishes have these black sheep betaken themselves? Let other parishes in the neighbourhood look out for jerry-builders on the loose, and excommunicate them vigorously.

* The dates given are those of the licensing of the plays, mostly by Sir Henry Herbert. It will be understood that the pieces were printed later, after intervals varying severally from eighteen months to twenty-seven years.

† March 20, 1639-40, buried Philip Massinger, a stranger. He died in his house in Bankside on the 17th of that month, aged fifty-six years. In that church lie Edmund Spenser, "player," the poet's youngest brother (1607); Laurence Fletcher (1638); John Fletcher, Beaumont's coadjutor (1635); and Henslowe (1610).

‡ With the patent of 1603 the Blackfriars and Globe companies exchanged their style of the Chamberlain's for his Majesty's servitude. At Queen Anne's death, 1691, they took the title of the king's daughter, wife to the future King Charles I.'s marriage, they were entitled the Queen's servants.

SCULPTURE AT THE ROYAL ACADEMY.

II.—THE "WATER-LILY." BY T. WOOLNER, R.A.

This is a reproduction from a photograph of Mr. Woolner's elegant and fanciful little work, a half-size alto-relievo in bronze, which hangs on the west wall of the "The Lecture-room" at the Royal Academy. It tells its own story.

THE RESTORATION OF PETERBOROUGH CATHEDRAL.

PETERBOROUGH CATHEDRAL, the tottering condition of whose central tower and pier supports so alarmed the Dean and Chapter at the beginning of last year, has progressed so far in the necessary work of demolition and reconstruction, that already the ceremony of laying the chief corner stone is a thing of the past, having been performed on Wednesday, May 7, by Pro-Grand Master the Earl of Carnarvon, acting under the commands of the Prince of Wales, who would himself have attended as Grand Master of the Craft, but for the sudden death of his brother, the Duke of Albany.

The story of Peterborough Cathedral, considered as an erection of stone and lime merely, and irrespective of its purely ecclesiastical fortunes and misfortunes, is a story which is not without interest. This fact, however, has never been so brought into relief as during the removal of the ancient fourteenth-century work—an undertaking which has been going on during the greater part of last year and has stretched into some portion of this. The ecclesiastical foundation of Peterborough owes its origin to Peada, king of the Mercians, who erected a rude church and monastery here in the year 655. Through numerous vicissitudes this religious establishment existed down to the Reformation times, when, thanks to the good offices of another king, or rather to the lucky forbearance of that potentate, the abbey church of Peterborough was not only preserved from destruction at a time of signal peril for such edifices, but had bestowed on it a renewed lease of life. Henry VIII., the ruthless iconoclast of English monastic growths, dealt generously, tenderly even, with the abbey of Peterborough. The ashes of the amiable, but badly-used Katharine of Aragon, his first queen, lay at that time, as they lie now, beneath the chancel floor of the Minster Church, and perhaps some feelings of remorse impelled him not only to withhold the touch of his destroying hand from this particular shrine, but to take prompt order towards its conservation for all time, so far as it lay within his power to do so. Henry not only spared Peterborough Minster, but left it endowed with a large share of the monastery's temporalities. He abolished Chambers, the last of the abbots, but with the same pen he partitioned the huge diocese of Lincoln, called into existence the new diocese of Peterborough, and appointed the deposed last of the abbots to be the first of the bishops.

After the tragedy at Fotheringhay, and until removed, twenty years subsequently, by her son to Westminster, the remains of Mary Queen of Scots slept here, occupying the southern basement of the chancel, over against the last resting-place of the hardly less unhappy Katharine, and contiguous to the tombs of Elfric and Kensius, two successive Archbishops of York, interred here in the eleventh century. Cromwell handled the capital of the new diocese rather unceremoniously, as was his wont, and for a short series of years thereafter the edifice stood bishopless and neglected, for threatening, indeed, for a time, to drift into the condition of a ruin. Local and national spirit, unskillfully directed though it was, happily averted the threatened calamity, and by an effort Peterborough Minster once more stepped into its old station of chief of the second rank of English cathedral churches.

The original erection of the Saxon king in the seventh century, the foundations and lower courses of which the operations of the present epoch have exposed to view, was, it is reasonable to assume, an edifice of no great pretensions. Although its foundation and lower walls undoubtedly consisted of plastered masonry, these walls were probably of no great height, and it has now been made evident to the eye that they were of no great thickness. They were most likely dwarf walls merely, designed to act as the bearers of a larger superstructure of timber. Wood was to be had for the felling in those days, and the fires which from time to

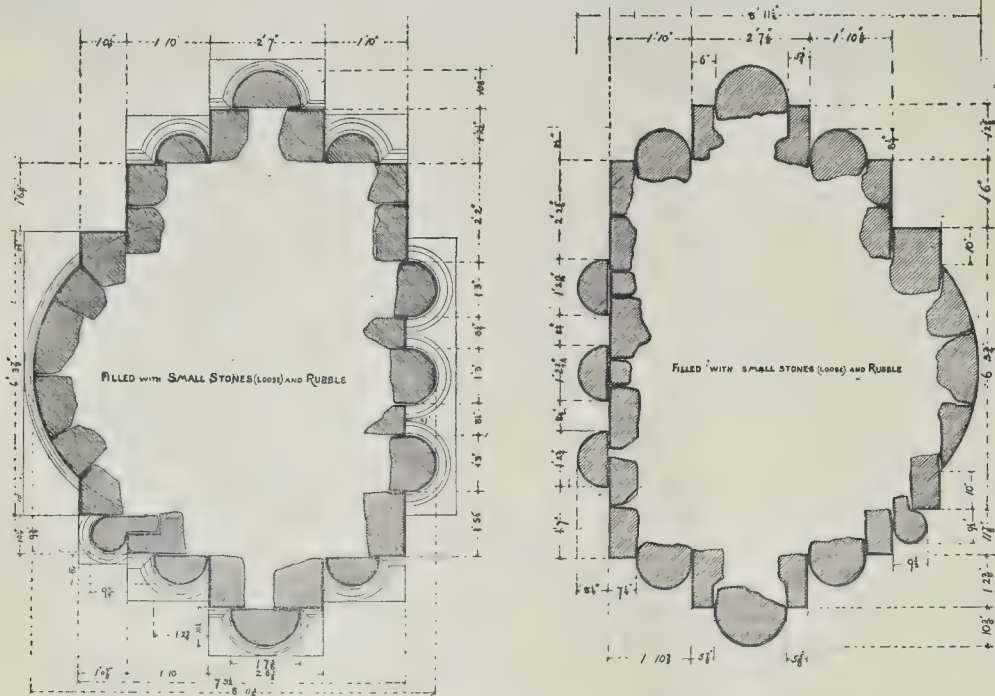
time overtook public and private buildings attest the extent to which it entered into the construction of these. The church and abbey of Peterborough were thus burned to the ground in the year 870, through the wanton incendiarism of the pillaging Danes. Subsequently, after a lapse of some decades, the Saxon monks took heart of grace and upreared a second cluster of monastic buildings on the fire-marked ruins of the old. These fell an intermittent prey to the repeated assaults of marauding Danes and contemptuous Normans about the period of the Conquest; but the local habitation and name of the monastery survived somehow under various fluctuations of evil fortune, until the reign of Edward I., when the security which the strong arm of this great captain achieved for internal England encouraged a scheme for a revived erection on a grand scale. The work was necessarily of slow progress. Abbot William de Waterville began with the central tower (now being restored) and the choir. His successor, Benedict, built the nave westwards, ending in the noble west front which is the boast of the pile. The bell-steeples immediately in rear of this west front were erected by Abbot Richard, still in the same reign; and these, with outlying accessory buildings, and accompanied by but trifling alterations, remained down to the troubles of 1641, when the old Abbots' Hall (a detached erection to which the old chroniclers invariably refer in terms of pride), together with two chapels, were ruthlessly swept away. From 1641 to 1853 the history of Peterborough Cathedral presents little for remark. A tying-back of the northern arch of the famous west front, rendered necessary by a growing displacement and its northerly arm; some setting-up and pulling down of spire and coronet work on the central tower and bell-steeples; a few patchings upon walls and piers; and some slight successive elevations in the level of the flooring of the church—these seem to have comprised the only landmarks of the slightest consequence.

Certain cracks and rents in the north-eastern pier of the great central tower, and in the tower itself aloft, had early in that period been noticed, without, however, anything of the nature of grave anxiety being excited thereby. These rents gradually assumed larger proportions, and in the beginning of last year the dean and chapter awoke to a sense of the positive certainty that the mass of the great central tower was steadily inclining to a point of instability at which it would be bound to tumble bodily to the ground.* The circumstances attending this startling discovery are fresh in the memory of our readers, and need but brief mention here. A Restoration Committee was promptly formed. The committee called in the services of Mr. Pearson, and obtained from him a report which practically decreed the pulling down of the tower, with at least two of its supporting piers. Under a contract entered into between the Restoration Committee and Mr. John Thompson, the tower and two piers quickly disappeared, revealing in the process the fact that the masonry of the time of Edward I. had never been anything but hollow and showy. Piers and tower-walls had been substantial only so far as the outer casing of Barnack ragstone was concerned, the interior being filled in exclusively with a loose, miscellaneous material which was entirely destitute of any quota of added strength, even granting—a grant which is, perhaps, barely warranted,—that it did not positively detract from the inherent rigidity of the unsupported outer casing referred to. This wretched condition of things was found to obtain all the way down to the basement, where, as it proved, the climax of structural inefficiency was reached. The piers of the tower, so far at least as concerned the two eastern ones just demolished, were, and always had been, virtually without foundation. They were bedded, not on rock, or on any reasonable equivalent, but on sand and loose stone chippings, with, beneath, a small substratum of gravel. These humiliating discoveries naturally gave rise to serious misgivings in the minds of the Restoration Committee with respect to the actual condition of the two western piers which the architect's first report had spared, as seemingly of a thoroughly sound construction. The services of Mr. Pearson were again put in requisition, resulting ultimately in a condemna-

*See lithographed illustration, from a measured drawing, showing the state of the north-east pier of the crossing, and inefficient bandaging which had been applied to it.

tion of these western piers also, on the too certain grounds of faultiness in foundation and a worthlessness of material composition not less flagrant than in the two cases already so fully exposed. Touching the internal make-up of the demolished piers, this second report of Mr. Pearson thus frankly speaks:—"Within the casing the whole body of these large piers was filled in with small rubble stones and sandy earth. There was scarcely a stone in them larger than a man's hand, and mortar seemed not to have been used except where some alteration had been made at a later date. It is quite impossible to conceive a worse piece of construction, and it is equally impossible to understand how it is that these piers have stood so long; nothing but the power of the Barnack rag-stone, out of which the thin outside casing is formed to sustain the enormous weight, saved them from destruction." On the foundations,—so called,—which formed, perhaps, the more glaring of these but too well-authenticated instances of Medieval "jerry" work, Mr. Pearson's report thus pronounces:—"They were of the most extraordinarily wretched kind, faced partly with small rough stones, stone chippings (of which there was a considerable layer), sand, and other equally loose material, and resting on a bed of soft gravel, although within a couple of feet of the rock." The tearing down of the remaining western piers, which immediately followed, and which was not fully accomplished until the present year had well advanced, has supplied ample justification for the drastic remedy insisted on by the architect. Alike in foundation and construction, these proved every whit as bad as their neighbours,—only, through some chance luck rather than because of any better management, enabled to carry down the course of the centuries rather a fairer outward show.

The rebuilding of these four piers has progressed rapidly. At the time of writing the least advanced is just rising above the floor of the cathedral, while the most forward is finished up to the triforium, where it awaits the spring of the arch. Of the two remaining, one stands about 5 ft. high (upon which the chief corner stone has just been laid with all due ceremonial), the other being well out of the floor, and hourly rising. The foundations of the new piers rest, of course, upon the solid rock so iniquitously passed over by the fourteenth-century builders, though only 2 ft. more of easy excavation would have laid it bare for use. These foundations are of concrete below, with, immediately above, three courses of very strong masonry, the stone of which is fresh from the quarries of Fotheringhay, Yorkshire. Upon this substratum are laid the sound blocks of Barnack stone preserved from the old piers, and replaced as far as possible in positions identical with those formerly occupied. Through-bonders of massive construction are laid at every fifth course, these being invariably composed of newly-quarried stone from Cliffeham quarries, Rutland. The interior of the casing at other parts is closely packed with fresh Luton stone, and the new work throughout represents a solidity of 13 cubic feet to the ton weight, as against 20 to the ton in the piers lately taken down. The main proportions of the lantern tower which these new piers are designed to support, will be identical with those of the one lately taken down, only there is likely to be some modification regarding the mode and manner of the skyward termination. Ever since the building of William de Waterville's tower in the fourteenth century, a chronic feeling of discontent with respect to its termination skywards has existed, resulting from time to time in various shifts of a minor kind, none of them proving effectual. The tower has to the eye always seemed offensively stunted as contrasted with the lofty and imposing pile from which it rose. A slight addition to the height appears at one time to have been contrived, but this was afterwards discarded. In lieu thereof the corner turrets were carried considerably higher up, presenting, however, still but a very indifferent effect, and thus they continued till there supervened the climax of last year's final condemnation of the entire tower. Peterborough Cathedral possesses no advantages arising from natural elevation of site; it but very slightly overlooks the neighbouring fens even, and the addition of a spire, all recognise, would certainly greatly enhance the effectiveness of the pile as an erection of commanding beauty. The question of finance is the absolute ruler here, and it may even be that the present tempting chance for



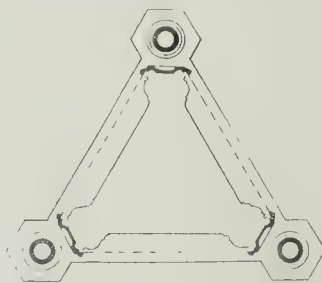
Medievall Jerry-building.—Piers, Peterborough Cathedral.
 ("Be sure your sin will find you out.")

fittings completing the fine old edifice offered by the renewal of the tower is doomed to drift past without being seized. The renowned west front of the building wants repairs which will, perhaps, send forth a cry for attention more loudly and more legitimately than would be possible in the case of any other consideration, after the present contract is completed. It has long been afflicted with rather a serious defect, provisionally arrested by a process of tying-back in one of its three arches,—a defect, the permanent cure of which, if money were not so scarce, ought to be entered upon without delay, in view of the disquieting consideration that the longer the postponement lasts the graver will be the task in hand when postponement becomes no longer permissible, as in time it must come to be. In addition, there are several minor structural ailments demanding attention before drawbacks in mere point of fancy or taste can in fairness be looked to, so that there seems no very promising prospect of a spire worthy of this cathedral being achieved,—unless in the chance of some donor or company of donors stepping forward with this particular accomplishment determinedly and exclusively at heart. The restoration fund, as it is understood to stand at present, will do little more than barely satisfy existing contracts; but the recently accomplished ceremony of foundation-stone laying, under the auspices of distinguished grandees of the Masonic craft, may reasonably be expected to put some new life into a subscription movement which has unhappily become rather languid. Progress is much to be desired in this direction if Peterborough Cathedral is to be relieved of even one-half of the disabilities under which it at present labours. Granting that a sum of 21,000*l.* is already secured to the restoration fund,—and that estimate is slightly in excess rather than otherwise of the actual figures,—there is a wide margin between that and the 61,000*l.* last year hazarded as indispensable to a thorough amending of all architectural defects within the walls of the building.

Erratum.—In the report of Mr. Wethered's paper on Viollet-le-Duc last week, for "Mr. Hamilton," read "Mr. Hamerton," and for "M. Baudot" read "M. de Baudot."

"WEATHER-HOUSE," STUTTGART.

THIS is an illustration of a "wetter häuschen," or erection for showing the state of the barometer and thermometer, &c.; a class of structure not uncommonly placed in public gardens and promenades in Germany, and sometimes taking the simpler form of a small column, looking a little like a sundial in general outline, and then called a "meteorological column." The present example is a rather more elaborate design than usual, which has been recently erected in the Town Gardens at Stuttgart, from the designs of Herr P. Lauser, architect, of that town. The accompanying cut gives the plan,



Plan.

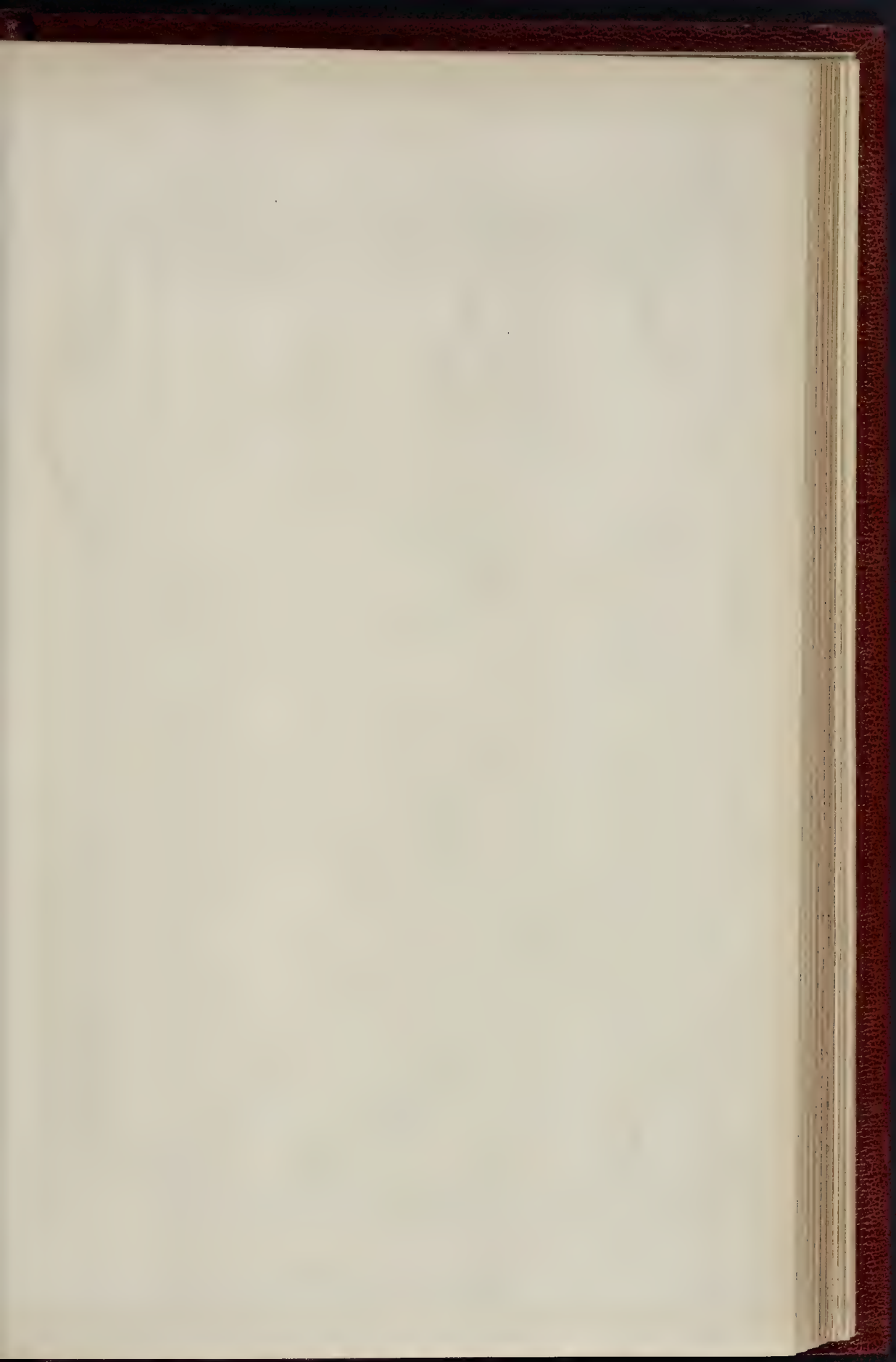
to a scale one-twentieth the real size: the view, reproduced by the ink-photo process from a photograph, gives the general design and effect. The material is cast iron; it has been very carefully modelled and worked in all its parts, with some colour to give additional effect. The figures of the water-sprites at the angles of the roof are painted flesh colour in the upper parts, whilst their fishy tails are painted bronze, touched with silver. The cornucopias in the frieze are painted similarly in correspondence with the natural colours of the object. All the un-modelled surfaces, such as the column and plinth, are kept of a soft, warm brown; small portions here and there are gilt in the cornice,

and the vane also is gilt. With this degree of gilding and colour, says the architect, it stands out very brightly against the dark background of foliage.

CHURCH OF ST. MICHAEL, COPENHAGEN.

THE drawing which we give of this church, by Mr. James Brooks, is a photo-lithograph of one which is now in the Architectural Room of the Royal Academy. It is a model type of modern Gothic design for a building of this class, reproducing, without mere copyism, the true spirit of Mediæval architecture,—solid, unpretentious, picturesque in outline, and entirely free from uncalled-for or superabundant ornament. The treatment of the angle buttresses of the tower, and the manner in which the change to the octagon in the turrets is managed, is very effective. In certain details this church very much resembles one which we illustrated in the *Builder* for May 5, 1883. Indeed, we remarked incidentally in commenting on this drawing, in our notes on the Academy architecture (p. 635, ante), on the similarity of a good many of Mr. Brooks's designs; but repetition in a powerful style is far preferable to variation in a weak one.

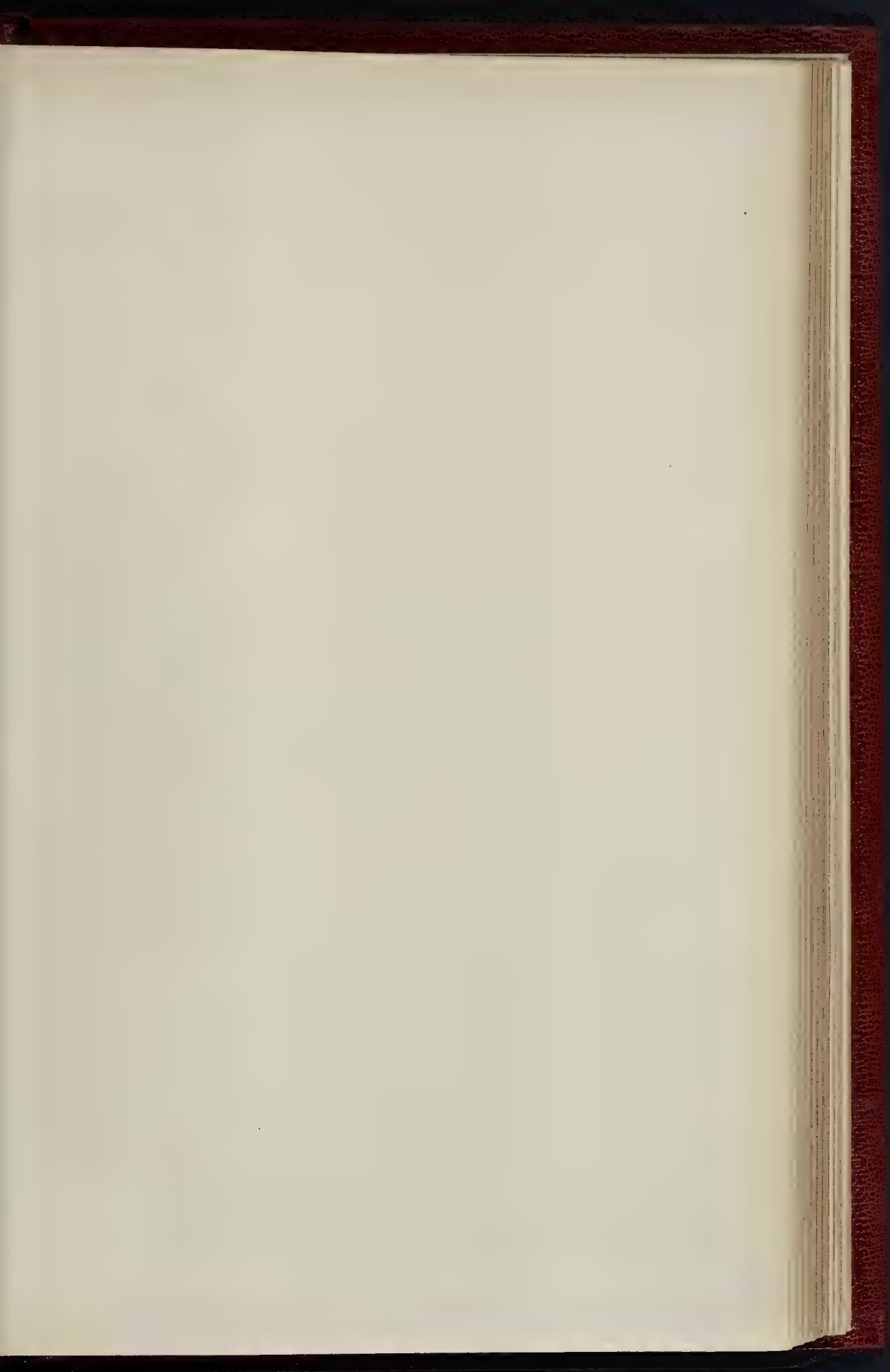
Society for the Encouragement of the Fine Arts.—A conversation of the members of this Society, the third of the season, was held on the 3rd inst. in the new Galleries of the Royal Society of Painters in Water-colours, Piccadilly. The rooms were brilliantly lighted, and the pictures were seen to great advantage, the fine collection of works being on view as during the day. The company was very numerous, the whole of the rooms being filled. A concert was given in the largest of the galleries, Miss D. Fonblanque, Miss Helen D'Alton, Madlle. Hülemann, and Mr. George Cox being the vocalists. The attractions of the music and of the many works of art on the walls caused the company to remain until a late hour for such gatherings. The Society's third conversation will be held on the 27th, in the same Galleries, for a further inspection of the pictures.





BY MR. T. WOOLNER, R.A.

SCULPTURE AT THE ROYAL ACADEMY.
"THE WATER LILY." By Mr. T. WOOLNER, R.A.

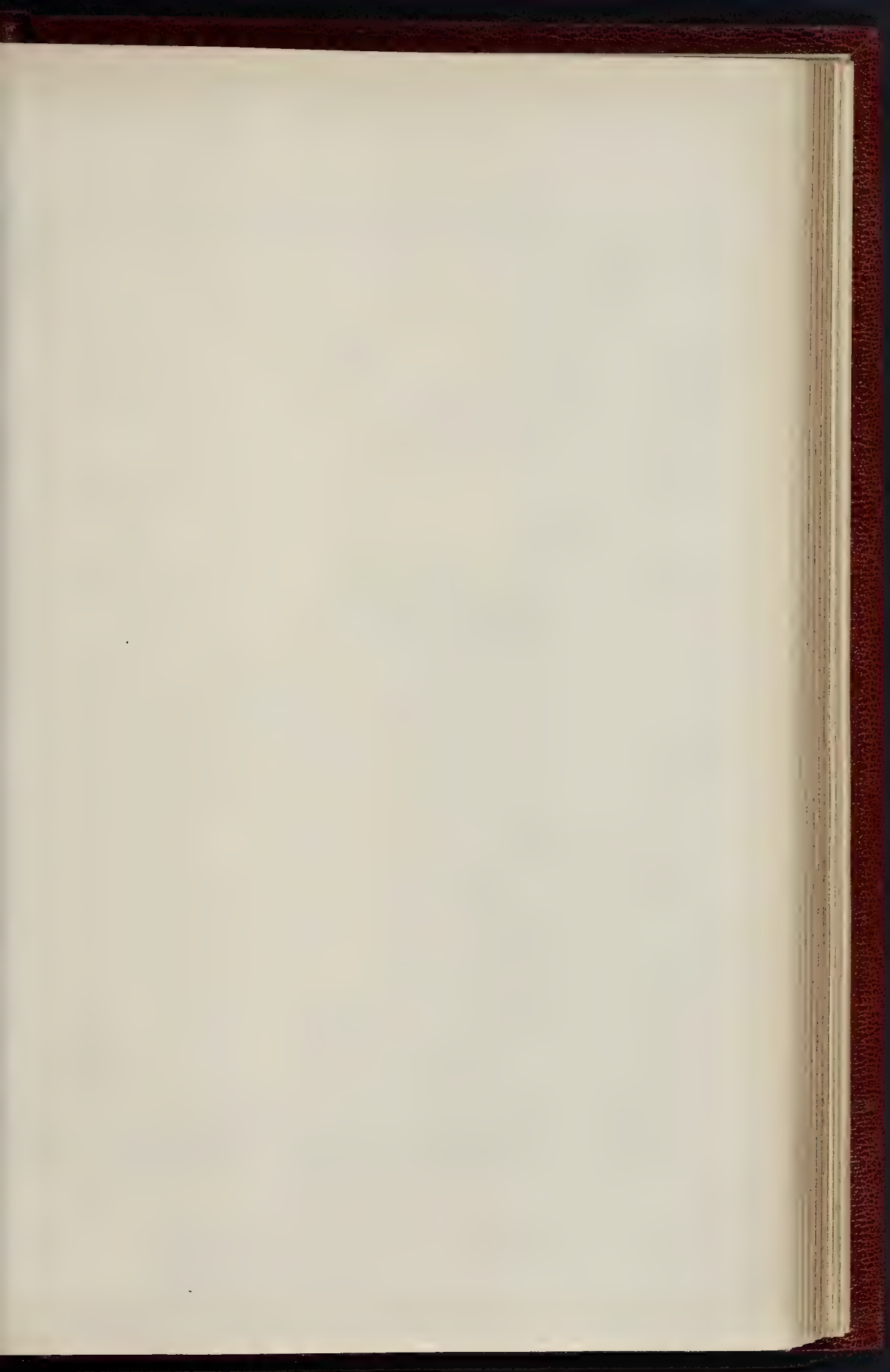




Church of S. Michael.
Coppenhall. *South East View*
James Brooks Archt



St. Andrew's Church, London, W.





THE INTERNATIONAL HEALTH EXHIBITION

A. BERESFORD PITE, del.

THE INTERNATIONAL HEALTH EXHIBITION

THE OLD

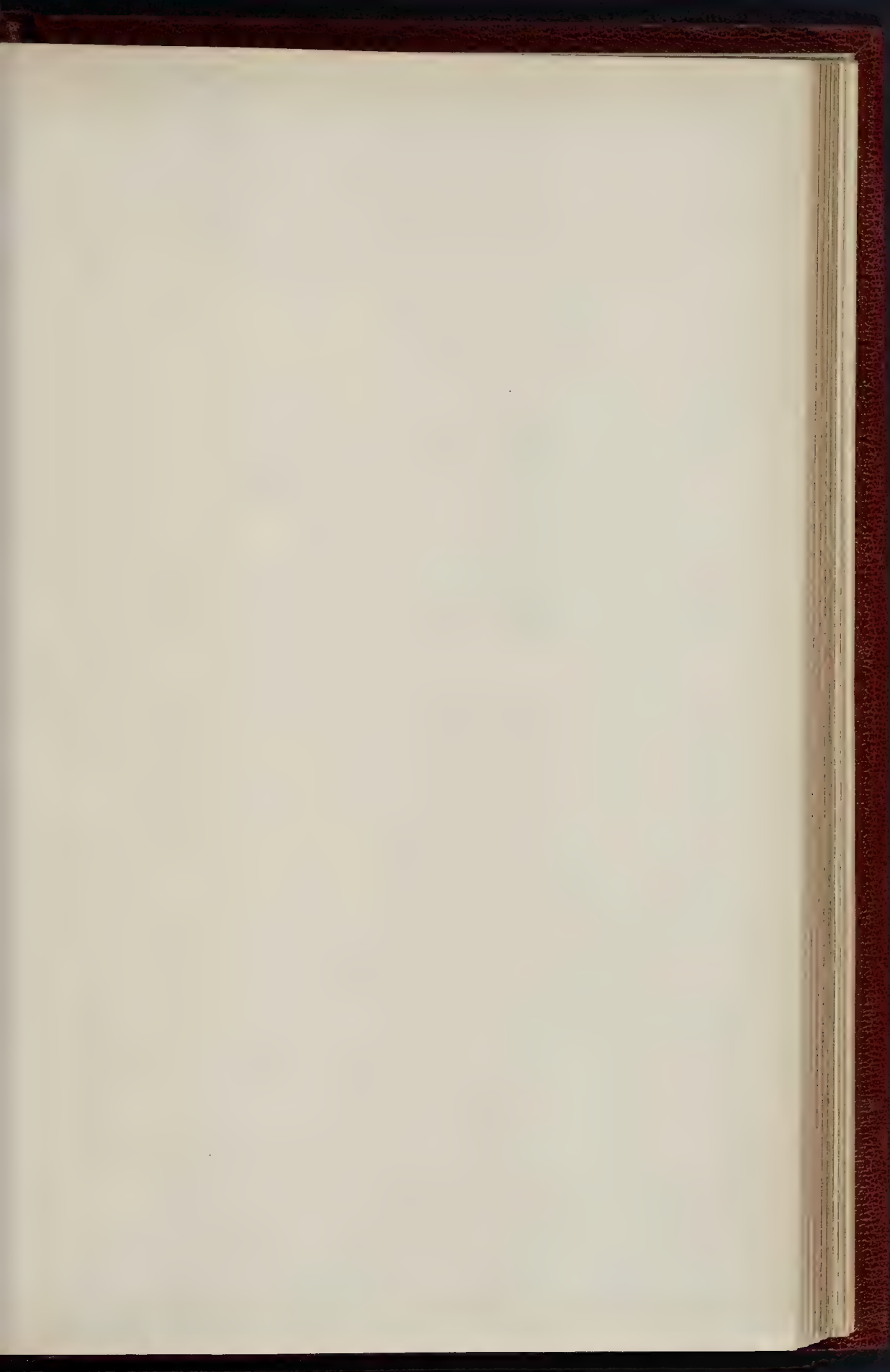


8 Castle St. Holborn London E.C.

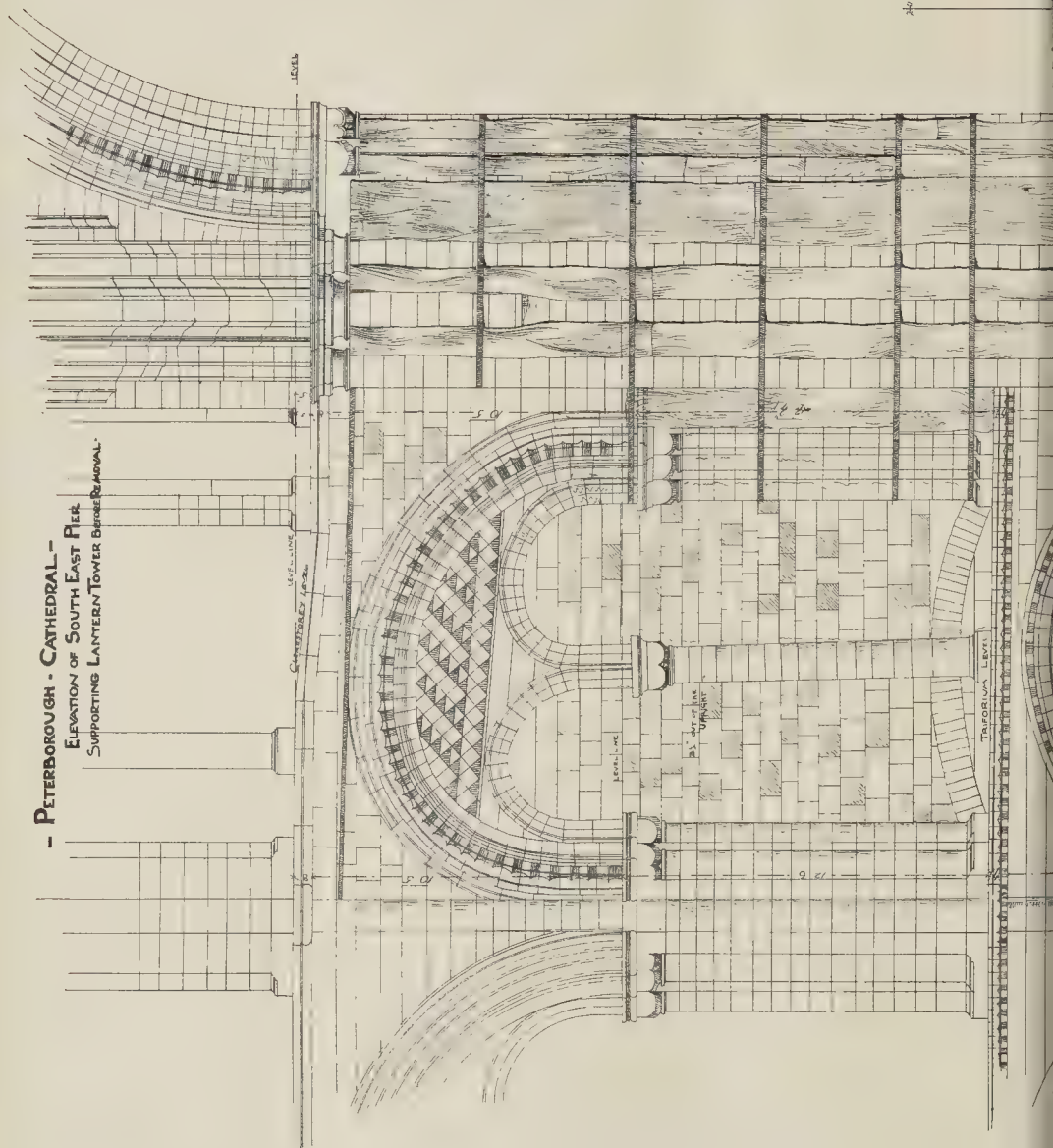
ION, SOUTH KENSINGTON.

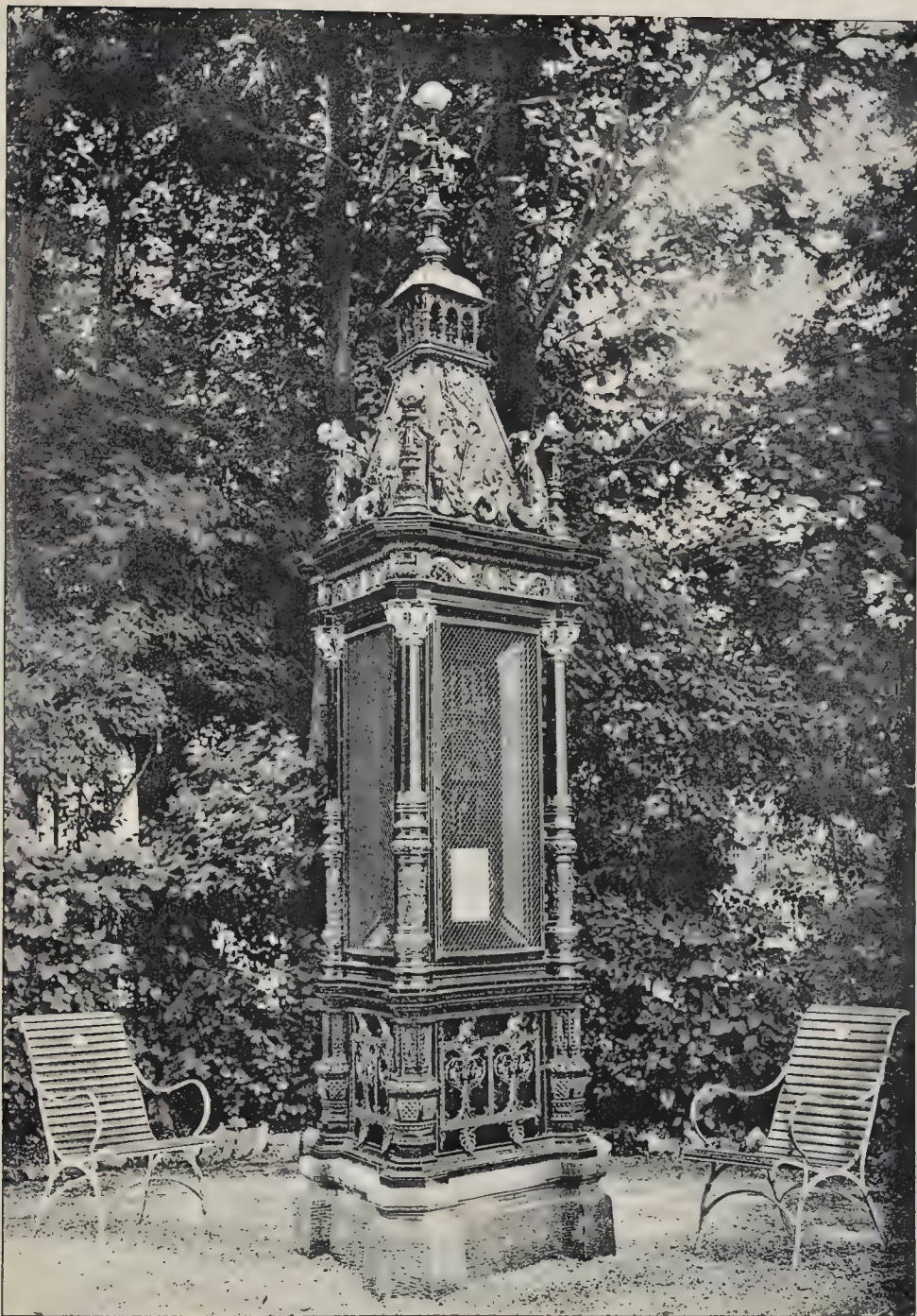
STREET.

MR. G. H. BIRCH, A.R.I.B.A.,
ARCHITECT



- PETERBOROUGH - CATHEDRAL -
ELEVATION OF SOUTH EAST PIER
SUPPORTING LANTERN TOWER BRIDGE REMOVAL.





INK PHOTO SPRAGUE & CO. LONDON

METEOROLOGICAL COLUMN ("WETTERHAUSCHEN") IN THE TOWN GARDENS, STUTTGART.

HERR P. LAUSER, ARCHITECT.

OLD LONDON STREET: HEALTH EXHIBITION.

The two views which we give of the old London street in the Health Exhibition are each taken from about the middle of the street looking opposite ways. That on the right, looking eastward, shows the reproduction of old Bishops-gate, with the statue in the niche over it to Erkenwald, fourth Bishop of London. This view shows the larger and more ornate of the houses illustrated; the one which forms an angle house on the right of this view, and on the left of the other view, being one which stood at the corner of Fleet-street and Chancery-lane, and was known as "Isaak Walton's House," though the tradition which connects it with him is of doubtful authenticity.

In the view looking west, we see a typical old City church, partly copied from All Hallows, Staining; and beyond this, further down the street, is a portion of the Middle-row, just outside Temple Bar, which was known as "Butcher's Row." Beyond this point the street turns and narrows (keeping up the traditional character of London streets), and disappears consequently from our point of view.

THE ARCHITECTURAL CONFERENCE.

(Continued from our Supplement.)

ENGLISH ARCHITECTURE THIRTY YEARS HENCE.

The following is a report of the discussion which ensued upon the reading of Professor Kerr's paper bearing this title, and printed in one of our Supplements this week,—

The Chairman, in inviting discussion, said that, valuable and able as the paper was, it was hardly what the title had led them to expect, for it was in the main a retrospect rather than a forecast.

The Right Hon. A. J. B. Beresford-Hope, M.P., said he had certainly passed a very interesting time since their good friend Professor Kerr began his paper. Like their chairman of that evening, he had anticipated a prophecy, but instead of a prophecy they had had a retrospect. Now, he thought Professor Kerr showed great wisdom in that. There was a good saying,—he believed it was an American one,—that Sir William Harcourt brought up the other day in the House of Commons, when he was run into a corner. He said he never prophesied unless he knew. Now, Professor Kerr had said a great many things very cleverly and very epigrammatically. With a good many of them he agreed very much; with others he did not agree so much. But to traverse his paper from first to last would be an impossibility, with any due Christian charity to the nerves and spirits or the somnolency of the gentlemen he had to address. So he would let many things pass. He would even admit what was the hardest to swallow of all, the words the Professor uttered in praise of that adventurer the Third Napoleon. He thought,—and he was sure Professor Kerr when he came to look over his paper would see, that he began with much too magnificent a philosophy. He had to leave his philosophy as he went on. He began with a very magnificent picture of art as a course of successive evolutions,—successive developments and improvements; and the whole result of his paper was that, instead of development or improvement, it was a constant going forwards, then going backwards, and then going round, and then going to the left and then going to the right, and such he believed it was. He thought all of them as they grew older,—while he hoped they would never become blunted in their principles,—did get more moderate in their hopes and expectations; that when they had a success, they thought as they might be for that success they would learn to regard it as a warning that the march of victory was conditional, and that only by unremitting exertions could they rise from height to height. Equally they learned that when they had a rebuff, even though that rebuff might be the transitory breath of a change of the wind, they might hope that it would be the prelude to some unexpected success afterwards; or, might be, a salutary training in some particulars, in which they were too exuberant, too self-confident, too intolerant. He made notes of several points as Professor Kerr went on. He thought he would not expect that he would disagree with him,—indeed, he thoroughly agreed with him,—in the picture that he drew of the dreary and prosaic

period which elapsed between the epoch of that great man Wren and the revival of art in our age. By this proclamation he (the Professor) had separated himself from that school which was a few years ago the accepted orthodox Classical school in that room and elsewhere. Still, he must point out to them that even in that period there were attempts, there were anticipations, there were scintillations of development, which, although they came to nothing, showed a divine originality which was born in the architect's soul. There was one man he would always quote as not having been duly appreciated,—a great man,—Nicholas Hawksmoor. He believed that in the work of Nicholas Hawksmoor there was much forecasting types that had been more completely developed in our day, but which was overlaid by the pedantries of the time in which his lot was cast. Then Professor Kerr went on to speak of "action and reaction." There he thoroughly agreed with him,—there was action and reaction,—but he thought that "reaction" was hardly consistent with the idea of perpetual progression. However, the point he would draw Professor Kerr's attention to was that his paper had been mainly dealing with a period of from twenty to thirty years, and dealing with a period of twenty or thirty years great chronological accuracy was desirable. Now he thought that in yielding to the temptation to make some of his striking parallelisms, Professor Kerr had rather forgotten that. He quoted together Pugin and Ruskin, Pugin and South Kensington, Pugin and the Exhibition of 1851. He would point out that although Pugin had a court in the Exhibition of 1851, it was but the "song of the dying swan." Pugin died the year after,—1852,—and he (the speaker) thought that the progressiveness of the different schools ought to have been differently stated. He said so with some personal feeling, having early in life been associated with men who might have been, like the conies, a feeble folk, but still they were men who in their feebleness and wilfulness had tried to hold up the standard of truthfulness, and did hold up the standard of applied art,—he meant the ecclesiastical school. This took place in the 'forties. He would say now,—and he thought they had reached the time when indulgence in mock modesty would be to wrong the dead and to wrong the living,—that the torch was then lighted of architectural truth and of applied art which the paper assigned to the 'fifties and to South Kensington. He did not think the ecclesiastical party were unpopular, but they had not the chic to gain general popularity. It was a movement of a few people much spoken against. South Kensington, on the other hand, had all the *début* of the Exhibition of 1851, with Royal patronage, with the magnificent,—what should he say?—advertising genius of his friend Henry Cole,—for he would call him his friend. Cole had gone to his rest, and after all, notwithstanding their many quarrels, he was bound to say there was something genial and hearty about the old fellow. The ecclesiastical movement began much earlier, and there were men connected with it who were too much forgotten now. There was one whom he would name particularly who died early in life, having suffered much from ill-health. In Richard Carpenter there was great genius, which the world did not fully appreciate. He thought Professor Kerr, if he ever resolved his paper into a book, which he considered he was bound to do, would have to go further,—he would have to illustrate it, to develop epigrams into paragraphs, and paragraphs into chapters. And he thought if he studied a little more, if he would not make those aphorisms and parallelisms and those rough-and-ready chronologies, he would find that Pugin was a man of an earlier date than he had assigned to him, and that the ecclesiastical movement had occupied a distinct position which he had not fully done justice to. And Mr. Ruskin would be found to belong to a later date than Professor Kerr assigned to him, for while he had had great influence with many people, it could be conclusively proved that much of the Gothic enthusiasm of the day was previous to his *début*, although he was adopted and accepted with open arms as a great ally,—as a Gordon who had come to rescue the garrisons which were already in arms under the Gothic standard. So, too, about the South Kensington Museum. He thought, with great respect, Professor Kerr had, for reasons which would be easily deduced from the facts he had given them, a little exaggerated the influence of Mr. Cole. He thought

they would find that Mr. Cole was not the great leader of men he had stated, but that he was a very clever *entrepreneur* who had availed himself of the men who had already started on their career. Let them take Mr. Crace, for instance. Mr. Crace would nowadays be quoted as the model of a South Kensington man; but was he not a creation of Mr. Pugin? After all, Mr. Cole's work was a brilliant work; but it was not an enduring work. As to the influence of archaeology on art he was a little puzzled by Professor Kerr's saying that the influence of archaeology on art was fading. He should have thought the contrary. What was the archaeology of fifty or sixty or a hundred years ago? Nowadays it might be queer archaeology, it might be misguided, it might be effeminate, it might even be sentimental, but surely the relation of archaeology to art during the last fifty years was not decaying, but, if anything, it was running to seed in a wild exuberance. Gothic was condemned, he saw, for municipal buildings, but that he did not admit, although there might be something in what Professor Kerr said very cleverly of sketch-making having beguiled mayors, aldermen, and common councilmen, into breaking out into "Queen Anne." After all, he gave mayors, aldermen, and common councilmen credit for good sense, and he did not see at all why, in ten or twelve years hence, a building of Burgundian Gothic should not be adopted for some town-hall in lieu of such most prodigious and gorgeous "Queen Anne" as that which was embraced in all its arms by the municipality of Leicester a few years ago. Professor Kerr seemed to find some amusement in referring to its Dutch affinities, but, after all, the art of Holland was by no means a contemptible art; it had made a great mark in Europe. Gothic, he heard, had done its work; that, again, was an opinion,—theologians would hardly say a "pious opinion," which facts refused to justify. Then, going back to the chronology, which he ventured to question, he found that Professor Kerr had put Pugin, Ruskin, and Fergusson into a triplet together. Now Mr. Fergusson's leadership was later than the date assigned to it by Professor Kerr. Mr. Fergusson was first known by his book on the Topography of Jerusalem. That was a topographical discussion which had nothing to do with the general science of architecture, but his "History of Architecture" appeared in the 'fifties, after Pugin had come and gone and was dead, and after the Exhibition of 1851 had come and gone and was dead. Fully admitting Mr. Fergusson's power and the great work he had done, he must claim that he should be placed rather in the second than in the first row of those who created the architectural revolution of our times. They heard that with the Law Courts Gothic architecture had surrendered its claims for ever. That was a magnificent sentence, but if he were to say that with the advent of the Gothic revival Modern Classical surrendered its claims for ever, it would be equally true. The sentence was infinitely too magnificent and too epigrammatic to be capable of truth. He did not go in for "for ever," he only went in for, say, twenty years,—and he asked any one there, supposing Professor Kerr and he happened to be alive twenty years' hence, to call him to account as to which was most right over that question. Now he came to another thing he was rather sorry to hear, for it did not seem to be just, nor did it seem to be logical. It was this, that Mr. Burges was deficient in power because Mr. Burges was called "Billy." No doubt Mr. Burges was christened William, and as undoubtedly, if he had been christened Richard, that might have led to his being called "Dick,"—but whether he were Billy or whether he were Dick he was very much surprised,—he was talking seriously,—that any one of Professor Kerr's ability and knowledge, who knew his contemporaries' works so intimately, should predicate want of power in that great genius, for he was a genius, in face of the evidence of the truth and great power which his works displayed. He always felt it a moral and artistic duty to stand up for Burges. With his great good nature, with his *bonhomie*, and his extraordinary fun and wit, he very often did not do justice to himself: he was too real and natural a man to pose for posterity. Therefore posterity, beginning with those who knew and survived him, should stand up for him and proclaim that he was really a great genius and a conspicuous power. He remembered that when Burges was appointed one of the

architects to compete for the Law Courts he went to him and said, "Well, now, Burges, you have got this chance; I know what sort of fellow you are; you must not spoil your chance by any of your jokes." Well, he told him that he would not, and after he had sent in his designs he came and said, "I have been good, indeed; the only joke I made was to stick the recording angel over the Record Tower," and he (the speaker) said, "All right, that will not do you any harm." He would tell them another anecdote that was honourable to both of the men concerned. When the exhibition of these drawings took place in that shed in Lincoln's Inn, each architect had a separate cell, round which his drawings were hung. As he (the speaker) was looking at Burges's drawings one day a friend came in, and, tapping the drawings, said, "I would not mind being beaten by those!" The man who said that he would not mind being beaten by Burges's drawings was Street. Those drawings were a noble set, and it was a great credit to Street to have the Law Courts assigned to him with such a magnificent series of drawings as Burges's in competition. Well, to go back to the paper. Professor Kerr grew poetical, and he called Street "High Church," Scott "Low Church," and Burges "No Church." There were six syllables for three men, and made up a most incomplete and inaccurate description. It was an epigram intended in good humour, he was sure, but he thought it would be a great pity if it were accepted as historical portraiture. It was, perhaps, intended as historical portraiture of the Du Maurier School; but it was not that of Livy or Tacitus. Well, he had made some more notes, but he did not think they were important enough to refer to. The whole paper was a very brilliant one; it was a good-humoured paper; and above all it was,—after all that Professor Kerr had said of the future of Ecclesiastical Gothic,—a recantation,—not at all complete, but still a recantation quite sufficient for him, and very refreshing,—of the old doctrine of the Donaldson, Cockerell, and Basevi school.

Mr. J. P. Seddon, in moving a vote of thanks to Professor Kerr, remarked that he had listened to his paper with interest, amusement, and profit, but he thought he had treated the different styles of architecture too much as if they were *bric-a-brac*. And then when it came to the question of prophecy, he must say that Professor Kerr's magnificent mountain had brought forth a mouse. He was surprised that he should have so entirely ignored the whole history of architecture, and he thought the conclusion he came to as to what would be the position of the Queen Anne style thirty years hence was but a lame one. He did not think that "Secular Gothic" was declining to the extent that Professor Kerr intimated in his paper, for he noticed that there was a good deal of Secular Gothic work going on throughout the country. He thought young architects were studying the principles of Gothic architecture more than was the case formerly. South Kensington had gathered and grouped a great number of specimens of art-workmanship, and its influence was to be seen in their improved manufactures; but there was a great deal of beautiful work wasted because many manufacturers were not wise enough to employ architects to design for them. It seemed to him to be a mistake to talk about the "Queen Anne" style of architecture having superseded Gothic, for there were numerous instances tending to a different conclusion. Let them take Norman Shaw's building, opposite St. James's Palace, and they would find that, except the debased arches on the ground-floor, and the "crinkle-crackle" over the pediments, the whole work was Gothic in outline and grouping.

Mr. Aitchison, A.R.A., in seconding the proposition, remarked that the paper read by Professor Kerr had been a very interesting one, and with many of its conclusions he thoroughly agreed. He must say that no one was a greater admirer of the Gothic revival than he was, for he regarded it as one of the greatest triumphs of our time. He could not fail to see that it was making undoubted though silent progress. Gothic could not be dispensed with, any more than other styles of architecture. He thought there was this to be said about the Queen Anne style, that it was but a return to the forms which not only this nation but all other nations had been in the habit of using of late years. There were very great improvements to be

observed in constructive architecture in relation to iron, and it would through manufactures be greatly developed in the future.

Mr. Stannus said there were many points in Professor Kerr's paper which he should like to speak upon, but he could not do so at that late hour, and he would suggest that the paper was worthy of consideration by a future meeting.

Mr. Aitchison said he thought this could only be done by Professor Kerr taking up a particular branch of his subject on a future occasion.

The Chairman observed that he thought Mr. Aitchison's solution of the difficulty was the right one. He hoped that Professor Kerr would at a future meeting of the Institute take up one branch of the subject, and thus give an opportunity to others of speaking upon it. There were one or two points he would have wished to touch upon had it not been so late, and competition was one which he believed in the future would take a very important position, but he hoped they would excuse his not making any more lengthened remarks in reference to it. There was one point, however, in which they would all agree, and that was in the vote of thanks to Professor Kerr for his very interesting paper.

Professor Kerr, in replying, said he would take the opportunity of saying that he was very much obliged to Mr. Beresford-Hope for the criticisms with which he had favoured them in reference to his paper. It was a rule of all human progress, he believed, of any account, that it never took place in the line in which any one thought he was directing it. In the old "battle of the styles," he took one side and Mr. Beresford-Hope the other, and inasmuch as that gentleman had said that he (Professor Kerr) had formally recanted the opinions he then entertained, it seemed to him that that was an indication that he was quite right in the views he had taken,—the *vid media* which Mr. Beresford-Hope recognised, though he would not admit it, as the diagonal of the two forces,—in fact, that he had in the last twenty years become a little wiser, and that Mr. Beresford-Hope had not.

Mr. Beresford-Hope.—Speak for yourself. Professor Kerr continued.—He was quite satisfied with the patience with which he had been listened to, and with the criticisms that had been delivered, with many of which he agreed entirely.

With this meeting the proceedings of the Conference terminated.

ON CATHEDRAL PLANNING AND SOME CATHEDRAL PLANS.*

WINCHESTER has a small Lady-chapel, terminating the east end, like Salisbury, but has only one grand transept and no projections at the west end. It does not seem to feel the lack appreciably, as one fears lest the interesting proportions of the chancel should be damaged. At Salisbury we were not conscious of any similar fear, because the double transepts had brought the projection along the body of the plan in a swelling gradation. The east end of Winchester is sufficiently removed from the great transepts to be independent of them and complete in itself and its relation to the entire length of the plan.

Durham has a burly massiveness on plan, true to the character of other aspects of the building. The so-called chapel of the nine altars (I cannot but think it should be seven) crowns the cruciform, as one did once at Lincoln and Fontaines, in a complete and final manner, but subservient to the central transepts. The nave is finished by the slight projection of the western towers, which seems to be the exact amount required to balance the whole without disturbing the mass of the east end. The Galilee porch, of the same width as the nave, is delicate enough on plan to be subservient to the rest.

Ely as a whole is simpler in outline than any which we have been considering (though we bear in mind the extraordinary feats of constructive skill and beautiful design that are wrapped up in it).

The nave, choir, and presbytery are unusually long and wide, but are well balanced by great transepts, comparatively short in projection. The design of the west end is unique. Narrow

but massive transepts, with a small apsidal chapel nestling against the south side of the nave, I am inclined to think that the original design contemplated a corresponding one on the northern side.

This little chapel gives the transepts depth enough to balance the plan, and, being low, plays no prominent part externally. This chapel has here exactly the same object to attain as the screen walls at Lincoln, already referred to. Though these two plans are different in almost every particular of design, we see that the architects had the same result to attain, and succeeded by a different method in each case.

Very fine turrets, nearly circular on plan, complete in a magnificent manner the design of the transepts, and make Ely a very interesting example of western transept planning. The Galilee porch interferes slightly with the happy result, owing to the great thickness of its walls, necessitated for abutments to the arches that carry the central western tower. We remarked that this was not the case with the Galilee at Durham, as the walls were not too thick to look delicate on plan.

Leaving the strictly English examples, we notice that Westminster, in spite of its general tendency to depart from national types, is English, in having a plan that is complete and beautiful as a whole; the bases of the western towers having enough projection to make a satisfactory termination to the nave.

Sir Christopher Wren's plan of St. Paul's has western transepts which are not quite happy in proportion, they seem either too large or too small, too large and deep for the length of the nave, and not far enough from the great transepts to aid their proportion. The nave could not well have been lengthened, as its huge arches would lose scale by any further repetition. The western transepts seem too small, when we realise that if they had been equal in size to the great arms of the cross, the nave would have been perfectly balanced, though this would have been a departure from the proper cruciform plan. We shall find this carried out in the plan of Münster Cathedral. This building, though small in comparison to St. Paul's, is more huge in scale. The nave consists of two spans, the eastern and western transepts are both the same size, have but little projection, and are the same width as the nave,—their size does not, however, interfere with the latter, which passes through the eastern crossing into the chevet, and through the western for an equal distance to a porch. In all the examples we have yet referred to, the western transepts have been connected with the façade, but at Münster they have no relation to such, the front being a gable between two simple square towers.

The English cathedral builders exceeded all their neighbours in their affection for the cruciform plan. The Continental architects were content to let it occupy a secondary position in their arrangements, such hobbies as chevets and double apses having the first claims on their consideration and skill.

The earlier church builders of France, however, adopted it more often than their descendants of the cathedral building epoch, and many very interesting examples of the use of both the Greek and Latin cross in their plans are well known to most of us.

The unique churches of Aquitaine, of the type of the Church of the Cordeliers at Toulouse, and those of Albi and Moissac, however, disregarded the cruciform for reasons which Mr. Fergusson explains thus:—It was "a country where Protestant feeling existed before the Reformation, and where, consequently, the architects studied more how they could accommodate congregations than provide show-places for priests." He remarks also on the many valuable suggestions they contain for us now.

But the introduction and rapid growth of the chevet soon absorbed the attention and skill of the French architects in planning. Though great artistic skill was concentrated later on, upon the design of the west fronts and towers, it was always without any serious alteration or improvement of the lines of the plan, all the interest of which is at the other end of the building. We have in England examples of façades planned to extend beyond the bare width of nave and aisles, but they are very rarely found in France. Rouen Cathedral is the only one I can call to mind. The fronts were increased in height, and covered with

* Continuation of a Paper by Mr. A. Beresford Hope, read before the Architectural Association on the 22nd inst. See p. 637, ante.

beautiful ornament, often to the top of the towers, as at Rheims and Paris, but play no part in the scheme of the plan. At Noyon we find a grand western porch extending along the front, but on plan it only diminishes the importance of the great towers behind.

In the seven-aisled cathedral of Antwerp the two external aisles are played away from the west front.

We have referred to the treatment of Münster Cathedral, in Germany, but it is not a type that was followed. There is so much originality and variety displayed in all the arrangements of German churches that it is exceedingly difficult to choose examples. Perhaps the chief characteristic is the use of the western apse. We have examples from Bamberg, St. Sebald's Nuremberg, and Augsburg.

At Bamberg the transepts are at the west end, to the exclusion of eastern ones. Both apses have choirs, which are reached by flights of steps that extend some distance into the nave, as in some Italian churches (there are other traces of Italian influence elsewhere in Bamberg). Both apses are flanked by two square towers, the western ones being objects of interest, as they are evidently founded on those at Laon. This treatment makes the nave central, as at Münster, being the body of the church in a full sense.

Both St. Sebald's Nuremberg, and Augsburg Cathedral have small early western apses, with eastern additions of later date. At the latter place there are two large western transepts at the nave level, the choir being raised. Here, however, the interest of the church is concentrated in the ingenious and successful planning of the chevet.

There are some interesting churches in Brunswick, the west fronts of which are carried above the nave roofs, to form a belfry between the flanking towers. At St. Catherine's Church one of the towers is crowned with a spire. This arrangement of front, however, has but little effect on the plan.

The west front of Strasburg Cathedral is designed for this type of belfry, but the whole block is internally opened to the church by three large arches, thus adding to the apparent length of the nave all the space down to the front wall.

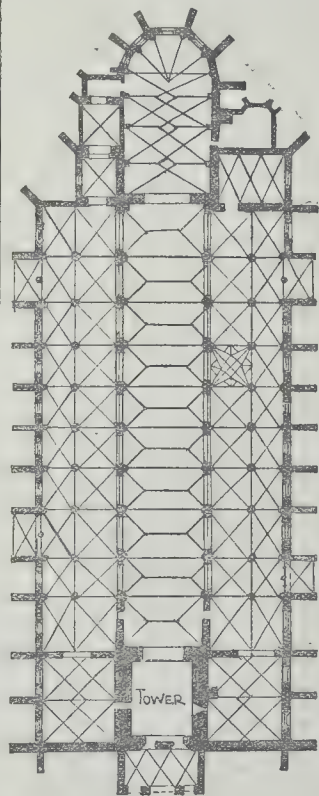
Ulm Cathedral is a fine example of the use of a central western tower the full width of the nave. Externally, a very fine composition, with flying buttresses gracefully reaching down to the side-aisle walls; this cathedral has five aisles, the nave arcade has rather acute arches and ungainly piers, however, with beautiful carving on alternate capitals; the double aisles on either side are of extraordinary construction; the ranges of very lofty circular columns which carry the elegant vaults are unique as works of masonry and beautiful design. When there, about eighteen months ago, a lottery was in progress to raise funds for completing the steeple to the great tower; the Mediaeval architect's drawing for which still exists in the cathedral side by side with the modern Dombaumeister's version, in rather ludicrous contrast. The tower at present is carried up to the base of the octagon, high enough for the building, and with its roof and dormers of coloured glazed tiles, crowned with an elegant little lantern and a small forest of pinnacles and finials, is altogether most charming, the colour is also rich and beautiful. But in all probability by this time the mischief is done, and the charm of the place gone, till the steeple shall have tumbled down. There is a very original and elegant triple porch between the western buttresses of the tower.

We have now dwelt upon the planning of the naves and western ends of a few cathedrals of Northern Europe, perhaps at greater length than their actual proportion to the whole building would justify, were it not that hitherto the greater share of attention has been concentrated on the study of the eastern ends and crossings, which present so many interesting problems to the architect and archaeologist. But feeling that completeness of plan in all particulars has been the special characteristic of our architectural forefathers, I have not hesitated to devote the greater portion of our short time to these rather overlooked factors in a perfect plan.

I do not wish, however, to leave the examples of this large subject that we have before us, without noticing the several ways in which the adoption of the cruciform plan affected, and was

in turn influenced by, the design of the east end of the cathedral.

The cruciform plan produced very long churches, as the crossing arms divided the length and gave interest to points in what would have been without them a mere corridor. Our own architects, who were content to trust themselves to the cruciform plan for a supply of sufficient interest and beauty, naturally found at the crossing the centre and most important part of the design. This is why they concentrated their powers on the design of the lantern towers which are the glory of our cities, and ours alone. Their thoroughness, in adhering to a definite scheme of plan, has been amply rewarded. The Continental architects, who either did not perceive the vantage-point they possessed at the crossing or were careless of it, produced no cathedrals which can rival the English in beauty and dignity of grouping.



Ulm.

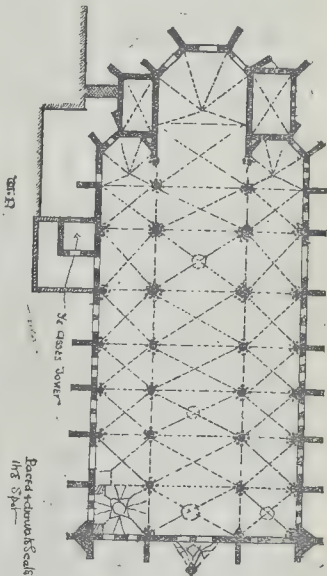
The fact that the square east end was the rule of our English practice has not a little to do with the emphasis given to the crossing; being conscious that the building could be terminated at any point to meet whatever proportion already existed, the transepts were lengthened and widened, to group externally with the lofty tower and to give space and effect to the interior. The transepts, as a consequence, are much more important and valuable here than abroad, their repetition beyond the choir being most fruitful of artistic results.

Both at Lincoln and Salisbury the choir transepts are of beautiful proportions, narrower and of less projection than the great transepts, and seem based on a cross of which the choir forms the stem and the sacrum the head, their point of crossing being the top of the main cross of which the other transepts are the arms, forming a cross within a cross, and yet maintaining their share in the whole plan. They effect a junction with the main vault, unlike their western brethren, the continuity of which is, however, undisturbed. Having been brought by their means now to the east end, we cannot but feel that there is no other possibly successful

termination for the cathedral but a square wall, the rectangle having been the foundation of all the beauties we have been enjoying. And we have reason to be proud of the self-restraint our architects displayed in this way, and wonder what posterity will find of that quality in our own work.

I do not propose to refer to the transepts of foreign cathedrals apart from their apses and chevets, to which they are entirely subsidiary, though this brings us in contact with Westminster, where the transepts and chevet seem to maintain an interesting and ceaseless struggle for supremacy, on plan; this is not visible externally, as most wisely the lantern tower has not been built. The combination of a lantern tower, of sufficient height and size to be proportionate to the whole building, and a chevet has yet to be accomplished. St. Ouen at Rouen is nearest the goal, but the charming lantern is too small for the nave.

Noyon is a rare example of a cathedral, which, though of second or third class dimension, is completely planned. The apsidal transepts are distinctly typical of French design. (Soissons Cathedral has one such beautiful transept with an aisle, but owing to the lines of the site the northern transept had to be kept square.) Noyon was originally united to the See of Tournay, the cathedral of which has apsidal transepts of much greater size, with aisles, but they are too far from the chevet and interfere with the nave.



Ratisbon.

At Noyon, apart from the feeling of harmony that the three semicircles give to the plan, there is a great lack of correspondence in proportion; the transepts want enlargement in the direction of the nave, as they are overpowered by the chevet.

St. Remi, at Rheims, is perhaps the nearest to successful treatment; here the transepts are square-ended, but have the usual apsidal projections on their sides nearest to the chevet. They are well known for the interesting puzzle, solved, in vaulting four bays on the west wall into three on the opposite. The church has a very grand nave of thirteen bays, which gives much dignity to the plan. The weak point is that the transepts want a little more width. The increased projection of the centre chapel of the chevet gives a beautiful apex to the plan. (Such a one as the pointed arch had taught the architect to look for.)

The smaller church of Notre Dame, Chalons-sur-Marne, is a happy proportion as a whole, the chevet not being too large for the nave,—it was then in its youthful prime, but the transepts are small. In fact, we find that the chevet was developed at the expense of

transepts and entire plan. The French architects did not display that balance of mind in planning which they proved themselves to possess in constructing their vaults.

At Chartres, we find the transepts of a good width, but shortened considerably, as the chevet has grown in size and possesses two encircling aisles besides its chapels; the nave suffers accordingly, as it has only one pair of aisles, and is of comparatively small area.

Notre Dame, Paris, has a beautifully complete plan, but the transepts have practically no actual projection beyond the line of the apse, which here, as at Chartres, has two encircling aisles and chapels beyond that are bounded by the semicircle of the apse. The nave has double side aisles, and chapels between the buttresses beyond them, which make it sufficiently wide to balance the great mass beyond and produce a well-proportioned whole, but, as we have seen, at the expense of real transepts.

The plans of Rheims and Amiens are other illustrations of the sacrifice of transept projection in consequence of the use of the chevet, which always asserted its claims to attention to the detriment of other portions of the cathedral, and which, though based on the cruciform plan, hid and over-rode its lines most unmercifully.

The examples that we have of the use Germany made of the chevet do not furnish us with any notable exceptions to the results we have observed that it produced in France. The chevet of Augsburg Cathedral is very interesting, because, being confined by the sweeping curve of the street at the east end, the architect did not permit himself to be deprived of the proportion to the whole that he wished to obtain by means of his apse; so he contrived to dispense with the real encircling aisle and carried the walk into the main apse, across behind the records. The result externally is very picturesque.

Perhaps the most typical eastern termination is the use of three apses corresponding with the nave and side aisles; early and semicircular at Brunswick, and semi-octagonal (like our bow windows) in the later work of Ratisbon. This latter cathedral is throughout of the most just and harmonious proportions, and the plan, though small in size and simple in outline, is complete. The transepts have no external projection; the chapels on each side of the choir are nestled behind the screen walls, and have the sacristy and treasury beyond them. The cruciform which lies buried in the triforium is not apparent on the plan, the architect's sense of fitness cautioning him against its use with the apse. We cannot do better than leave the consideration of foreign cathedrals with this, one of Germany's most perfect examples.

In conclusion, I trust that the rather rambling investigations we have been conducting among some cathedral plans may not have been without interest, if only in awakening recollections of happier descriptions and more ably conducted tours. And, for my own part, the pleasurable study that this paper has involved during the last few days will be amply repaid if your attention has been directed to what I feel to be a great fact, namely, that our cathedrals possess plans which are beautiful works of art in themselves, and which will well repay both careful measurement and study.

ART IN AMERICA.

This was the subject of a lecture by Dr. Phéné, F.S.A., recently delivered before the Society for the Encouragement of the Fine Arts, 9, Conduit-street, Regent-street.

The lecturer divided his subject into three parts.—The past art of the American continent, as compared with the ancient art works of the other continents; the present condition of art and art workers in America; and the future prospects of art in that continent. He observed that the antique art was found in several instances, chiefly in monoliths and earthworks, to have a very close similarity with the ancient works in Europe and in Egypt. So striking, indeed, that from it the lecturer concluded that a communication must have existed on one side or another of the American shores with the opposite continent. Indeed, some of the stone structures discovered in Ohio and Central America were found to be the same as those of a well-known Asiatic type. The Basques, who were well acquainted with the Phœnicians, traded with America before the time of Colum-

bus, as related by Gosnold, Brereton, and others, and such works are principally found on the European coast, where the Basques traded.

As to the present, the lecturer described his journeys through the States, in routes seldom taken by travellers of to-day, as being quite out of the lines of railway traffic. The private collections in these rural districts, consisting of the antiquities of the several States, and the careful delineation of the same by the local collectors, was an evidence of innate love of art, and application and devotion in an art direction in the country. In the great cities there were collections of paintings of great value, and the museums at Washington and New York rivalled those of Europe.

In the future, it was anticipated from the increase of wealth, and consequent facility for study in art subjects, that a great original outburst of American fine art would ensue. So great had been her works in architecture, so wide her inventions, that when the mind of her citizens was turned to art subjects, the highest results might reasonably be anticipated.

Mr. Hornum Rassam, F.R.A.S., F.R.G.S., the Oriental explorer, presided.

PREHISTORIC MAN IN EGYPT AND SYRIA.

A LARGE public meeting was held by the Victoria Philosophical Institute of London last week, at which its members gave a worthy welcome to Vice-Chancellor Dawson, C.M.G., of McGill University, Montreal, at whose instance the British Association visits Canada this year. The Society of Arts kindly lent its premises for the occasion, and its great theatre was crowded in every part long before the hour of meeting. The chair was taken by Sir H. Barkly, G.C.M.G., K.C.B., F.R.S., who, after the new members had been announced by Captain F. Petrie, the secretary, welcomed Dr. Dawson amid loud applause, and asked him to deliver his address: it was on "Prehistoric Man in Egypt and Syria," and was illustrated by large diagrams, also flint implements and bones collected by Dr. Dawson himself on the spot, during his winter tour in the East; Professor Boyd-Dawkins, F.R.S., kindly assisted in the classification of the bones.

In dealing with his subject, Dr. Dawson remarked that great interest attaches to any remains which, in countries historically so old, may indicate the residence of man before the dawn of history. In Egypt, nodules of flint are very abundant in the Eocene limestones, and, where these have been wasted away, remain on the surface. In many places there is good evidence that the flint thus to be found everywhere has been, and still is, used for the manufacture of flakes, knives, and other implements. These, as is well known, were used for many purposes by the ancient Egyptians, and in modern times gun-flints and strike-lights still continued to be made. The debris of worked flints found on the surface is thus of little value as an indication of any flint-folk preceding the old Egyptians. It would be otherwise if flint implements could be found in the older gravels of the country. Some of these are of Pleistocene age, and belong to a period of partial submergence of the Nile Valley. Flint implements had been alleged to be found in these gravels, but there seemed to be no good evidence to prove that they are other than the chips broken by mechanical violence in the removal of the gravel by torrential action. In the Lebanon, numerous caverns exist. These were divided into two classes, with reference to their origin; some being water-caves or tunnels of subterranean rivers, others sea-caves, excavated by the waves when the country was at a lower level than at present. Both kinds have been occupied by man, and some of them undoubtedly at a time anterior to the Phœnician occupation of the country, and even at a time when the animal inhabitants and geographical features of the region were different from those of the present day. They were thus of various ages, ranging from the post-Glacial or Antediluvian period to the time of the Phœnician occupation. Dr. Dawson then remarked that many geologists in these days had an aversion to using the word "Antediluvian," on account of the nature of the work which, in years now gone by, unlearned people had attributed to the Flood described in Scripture, but as the aversion to the use of that word was, he thought, not called for in these days,

he hoped it would pass away. Speaking as a geologist, from a purely geological point of view, and from a thorough examination of the country around, there was no doubt but what there was conclusive evidence that between the time of the first occupation of these caves by men, and they were men of a splendid physique, and the appearance of the early Phœnician inhabitants of the land, there had been a vast submergence of land, and a great catastrophe, say, a stupendous one, in which even the Mediterranean had been altered from a small sea to its present size. In illustration of this, the caverns at the Pass of Nahr-el-Kelb and at Ant Elias were described in some detail, and also, in connexion with these, the occurrence of flint implements on the surface of modern sandstones at the Cape or Ras near Beyrout; these last were probably of much less antiquity than those of the more ancient caverns.

A discussion ensued, which was taken part in by a number of distinguished Fellows of the Royal Society, including Sir H. Barkly, F.R.S., Professors Wiltshire, F.R.S., Warrington Smyth, F.R.S., Rupert Jones, F.R.S.; Colonel Herschel, F.R.S., the talented son of the late Sir John Herschel; Dr. Rae, F.R.S., the Arctic explorer; Dr. Dawson, F.R.S.; Mr. D. Howard, the vice-president of the Chemical Institute; and other geologists.

THE COMPETITION QUESTION.

THE following form of circular has been prepared by the Competitions-Memorial Committee (R.I.B.A.), to be forwarded to the promoters of proposed architectural competitions:—

Gentlemen,—The Committee appointed by the Royal Institute of British Architects, with a view of impressing upon promoters of competitions the importance, both in their own interest and in that of the architectural profession, of appointing a professional assessor of established reputation in all cases to advise the committee of selection on the designs submitted, having heard that you propose to obtain designs for your new building by means of a competition, beg respectfully to urge upon you the appointment of a professional assessor to advise you, for the following reasons:—

Because it requires the knowledge and skill of a specialist of great experience to weigh the merits and demerits of rival designs, and to decide on their suitability for their intended purposes and for the site.

Because designs are unfortunately often submitted in competition, which are in violation of the conditions; while others, if executed as designed, would largely exceed the sum at the disposal of the promoters; while, again, a design in many ways inappropriate for the purpose may be submitted. In all such cases professional advice would be invaluable to promoters, saving them from possible litigation, and from incurring unnecessary expense, or the lasting inconvenience of erecting a building unsuited to its purpose.

Because the not unnatural tendency of an architect competing for a building is often to underrate the cost of his design, while a professional assessor approaches the question in a more impartial manner, and his judgment is therefore more likely to be the right one. He will also better be able to gauge from the designs (an all-important matter) whether their authors show competency in design, general arrangement, and construction.

Because by the appointment of a professional assessor you will not only be assisted in the selection of the best designs, but you will also enable many good men to compete who would not otherwise be able to do so.

Because the number of architects agreeing not to take part in any public architectural competition, unless one or more professional assessors of established reputation are appointed to advise the promoters on the relative merits of the designs submitted in the competition is upwards of 1,350, and the list contains the names of most of the best known men in the profession. Such an expression of opinion will, it is hoped, have weight with yourselves and other promoters, who are frequently placed in an invidious position by the powerful influence which may be brought to bear by unscrupulous competitors, and by other means, where there is no assessor, which would be to a very great extent removed by the appointment of one.

Because promoters would find great advantage in securing the services of an assessor, as an initial step, to assist in drawing up the conditions of the competition, and announcing his employment when advertising the same.

This Committee does not attempt to advise promoters on the selection of an assessor, but would refer them to the President and Council of the Royal Institute of British Architects, No. 9, Conduit-street, Hanover-square, London, W., or to any well-known architect of established reputation, not necessarily a Member of the Royal Institute of British Architects, who is not a competitor.

The selection of an assessor or assessors should

be to a large extent governed by the nature of the proposed competition, the object being to obtain the services of men most conversant with the requirements of the class of building contemplated. The Suggestions for the Conduct of Architectural Competitions, published by the Royal Institute of British Architects, which are inclosed, will be found very useful for the guidance of promoters, but this Committee does not recommend the competition system when the amount to be expended is under 20,000l.—We remain, Gentlemen, your obedient servants,

COLE A. ADAMS,
ASTON WEBB,
Hon. Secs. of the Committee.

CONFERENCE OF FRENCH ARCHITECTS.

We have received the following programme of the arrangements for the Conference of French Architects, to be held at the Ecole des Beaux-Arts, from June 9th to 14th (inclusive), under the auspices of the Société Centrale des Architectes:—

"PROGRAMME DES SEANCES ET VISITES.

Lundi, 9 juin.

à 2 h.—Constitution du Bureau et ordre des travaux du Congrès.—L'architecture au Salon, par M. Achille Lucas, architecte.—Visite du chantier du Lycée Janson; M. Laisné, architecte.

Mardi, 10 juin.

à 10 h.—Visite des égouts de Paris. (Réunion à 9 h. 1/2 très précises, place du Châtelet).
à 2 h.—Compte rendu du Salon du Musée des Arts Décoratifs. Conférence par M. Paul Séville.—Notice sur feu Chenavard, par M. Charles Lucas.

Mercredi, 11 juin.

à 9 h.—Visite du chantier du Sacré-Cœur; M. Abadie, membre de l'Institut, architecte.
à 2 h.—Conférence sur une question d'archéologie, par M. E. Desjardins, de l'Académie des Inscriptions et des Belles-Lettres.—Des Concours publics, étude par M. Paul Wallon.

Jeudi, 12 juin.

Excursion à Blois, visite du château; M. A. de Baudot, architecte.

Vendredi, 13 juin.

à 2 h.—Etude de la création d'une Caisse destinée à soutenir les procès en responsabilité. (Veu de Congrès de Nice, février, 1884).—Compte rendu du Congrès des Sociétés savantes, par M. Alf. Normand.—Conférence sur la céramique, par M. Deslignières.

Samedi, 14 juin.

à 9 h.—Visite aux ateliers de peinture sur verre de M. Didron, boulevard d'Enfer, 6.

à 1 h.—Distribution des Médailles décernées par la Société Centrale des Architectes, à l'Architecture privée, à l'Ecole des Beaux-Arts, aux Ecoles privées, au Cercle des Maçons, au personnel du Bâtiment, aux Industries d'Art.—Notice sur feu Lenoir, par M. Julien Hénard.

à 7 h. très précises.—Dîner confraternel, à l'Hotel Continental.

Nota.—Tout membre du Congrès devra prévenir à l'avance le Bureau pour être autorisé à traiter une question relative à l'Architecture ou à l'Archéologie, au delà de ces indications ci-dessus. Pour toute demande d'invitation ou tout autre renseignements, écrire au Secrétaire du Congrès, au siège de la Société Centrale des Architectes, boulevard Saint-Germain, 168.

COMPETITIONS.

Baths and Washhouses, Newcastle-on-Tyne.—Mr. Pictou, of Liverpool, who was appointed by the Newcastle Corporation to decide upon the plans sent in for the erection of baths and washhouses in Scotswood-road, Byker, and Arthur's Hill, has announced his award as follows:—For the Scotswood-road site, 1st, Messrs. Gibson & Allen, Newcastle-on-Tyne; 2nd, Messrs. Clark & Moscrop, Darlington; 3rd, Messrs. Tate & Poppelwell, Manchester. For the Byker site, 1st, Messrs. Gibson & Allen, Newcastle-on-Tyne; 2nd, Messrs. Clark & Moscrop, Darlington; 3rd, Mr. T. W. Dyson, Manchester. For the Arthur's Hill site, 1st, Messrs. Gibson & Allen, Newcastle-on-Tyne; 2nd, Messrs. Clark & Moscrop, Darlington; 3rd, Mr. Alfred Darbyshire, F.R.I.B.A., Manchester. The cost, exclusive of sites, not to exceed 24,000l.

The Bowling Cemetery, Bradford.—At the meeting of the Bradford Town Council on Tuesday last, Alderman Hardaker, chairman of the Sanitary Committee, moved that, on the recommendation of the committee, the Council should select as the best of the competitive designs for the Bowling Cemetery those marked "Salus Populi" for the laying-out of the grounds, and those marked "Home" for the erection of the buildings; those marked "Fiat Justitia"

as the second in order of merit, and those marked "Red Cross" as the third in order of merit; and that, in accordance with the advertised conditions, premiums of thirty-five and fifteen guineas be paid respectively to the "Fiat Justitia" and "Red Cross."

There were, he said, twenty-four competitors. Mr. T. C. Hope seconded the motion, which was unanimously agreed to. On the sealed envelopes containing the names of the authors of the various designs being opened, it was found that the design of "Salus Populi," was by Messrs. George Heaton, Wigan, and Mr. W. J. Ralph, Chester; "Home," by Mr. W. J. Morley, architect, Bradford; "Fiat Justitia," by Messrs. George Hepworth and Samuel Wilkinson, architects and surveyors, Brighouse; and "Red Cross," by Messrs. Hepworth & Wilkinson and Messrs. Smith & Woodhouse, Manchester.

THE LATE VIOLET-LE-DUC.

SIR,—I hope you will favour me with space in your columns to express my deep sense of indebtedness to the Council of the Royal Institute of British Architects for allowing me to take part in the Conference of last week, and also to thank the members, as a body, for their more than kind reception of my paper on Violet-le-Duc.*

No fitter place or audience could have been found for some mention of the genius and work of a man who was one of the last to say a word in praise of himself.

I know that Violet-le-Duc held his English contemporaries and British architects generally in high esteem; and he never forgot that he was the honoured recipient of the Gold Medal of the Institute, which is now among the treasured heirlooms of his family.

It would require a cone, but half a dozen papers, to give an adequate presentation of his spacious intellect; but my main object will be served if I should in any way be the means of inducing the younger members of the architectural profession not merely to copy his drawings,—instructive and beautiful as they are,—but to study his writings, so pregnant with practical suggestions.

I received, a fortnight ago, a letter from his son, expressing his regret that it was not in his power to send for exhibition at the Conference a collection of the more important of his father's larger drawings, which are no longer his, but the property of the French nation, and are now being arranged for permanent hanging in the Salle Viollet-le-Duc at the Trocadéro, adjoining that fine museum of French historical sculpture which owes its origin to him, and was the latest fruit of his prolific life.

CHARLES WETHERED.

West Grange, Stroud,
May 12th.

ARCHITECTS' FEES.

BYRNE AND WILMOT v. STAFFORD.

This case, which may be of some interest to the profession, was tried before his Honour (Judge Lushington) in the Chertsey County Court, Mr. Porter, instructed by Mr. Skidder, being counsel for the plaintiffs; and Mr. Baggally appearing for the defendant. The case lasted the whole of the day. The plaintiffs are architects practising in London and at Windsor; and were employed by the defendant, a Mr. Stafford, residing at Windlesham, Surrey, to prepare plans and superintend a residence for him near Egham, at an agreed commission of five per cent. on the lowest estimate, the plaintiffs agreeing to waive their travelling charges owing to one of the plaintiffs, Mr. Byrne, A.R.I.B.A., being District Sanitary Surveyor, and frequently visiting the neighbourhood of the proposed house, just as the building was approaching completion. The contractor, Mr. J. Higgs, failed. The defendant shortly afterwards asked one of the plaintiffs, Mr. Byrne, to prepare a specification for the completion of the building at an agreed sum of three guineas. This not being done as quickly as the defendant wished, owing to a delay of a week through the illness of Mr. Byrne, wrote a hasty letter dismissing them whereupon the plaintiffs sent in their account claiming a balance of 43l. odd, the correctness of which was not in dispute; but a counter-claim of 47l. was set up by the defendant for negligence, claiming that certain omissions made by the builders should be paid for by the architects.

The defendant, on being examined, proved the orders had been given to the contractor for some of these previously to his failure, and others referred to in the set-off, were matters which were fully explained to his Honour.

The architects claimed their right to have altered under the general conditions of the specification, such alterations being deducted from, or added to, the contract sum at the completion of the work, and measured and valued according to the priced quantities which formed part of the contract, and were prepared by an independent surveyor.

His Honour pointed out to the jury that the

architects were not to be held responsible for the omissions of the contractor, unless negligence on their part could be shown. As there was no evidence of this before him he considered the defendant had made a serious mistake in dismissing his architects without sufficient cause; and the counter-claim, if it was to be made at all, should be made against the estate of the contractor and not against the plaintiffs, who were only his agents, and acting within their rights.

Mr. Sams, A.R.I.B.A., and other witnesses, attended to give evidence in favour of the plaintiffs' claim; but his Honour, without calling on them, directed the jury to find for the plaintiffs.

The jury, without leaving the box, gave a verdict for the full amount of the plaintiffs' claim, rejecting the set-off. His Honour certified for costs on the higher scale.

STAINED GLASS.

Fulford.—The Parish Church of Fulford, Yorkshire, which was rebuilt some six years ago, having been destroyed by fire, has lately had Munich stained glass introduced into the large five-light east window. Each light contains a separate subject representing one of the principal scenes of Christ's life. It has been designed and executed by Messrs. Mayer & Co.

Burnham (Essex).—On Easter Sunday a new memorial window was unveiled on the north side of the chancel of the parish church; the subject ("Acts of Charity") is illustrated in three lights, by groups of figures in Oriental costume, beneath which are the texts,—"I was an hungred and ye gave me meat," "I was sick and ye visited me," "Naked and ye clothed me"; the crown of the window and intervening spaces being filled with rich tracery. The cost of the window has been defrayed by Mr. and Mrs. Richmond, in memory of their parents. The window was supplied by Messrs. Jones & Willis, of Great Russell-street, London, and fixed by Mr. Charles Read, builder, of Burnham.

Brighton.—The whole of the windows on the north and south sides of the Church of the Annunciation, Brighton, have been filled with stained glass to a scheme arranged by the Vicar, representing figures of the Apostles on grisaille background; also the three-light window at the east end, subject the Adoration of the Lamb. Messrs. Heaton, Butler, & Bayne, of Garrick-street, London, were the artists.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

May 2.—7,118, E. P. Cribben, Dublin, Channel Roofing and Awning.—7,119, J. S. Thompson and W. Thompson, Wexford, Concrete Building.—7,123, F. L. Jeyes, London, Ventilating Buildings, &c.—7,125, F. Brown, Luton, Stove Grates.—7,141, A. V. Brooks, Glastonbury, Register Grates.—7,143, W. Stubbs, London, Fire-grates.—7,144, G. Wright, London, Stove-grates.—7,147, E. Paterson, Liverpool, Window-sashes.—7,148, W. Bartholomew, London, Flushing-tanks.—7,155, T. T. Onslow, London, Fire-lighters.

May 5.—7,203, W. J. Hopkins, Worcester, Expanding and Contracting Grate.—7,205, W. W. Fyfe, Aberdeen, Ball-taps.—7,216, C. W. Osaston, London, Slide Fanlight, Stay, &c.—7,248, F. L. G. Gunn, Dublin, Dust-bins, &c., for Separating Cinders from Ashes.—7,255, M. Williams, Wigan, Preparing Lime for Sanitary Purposes.

May 6.—7,268, J. L. Thomason, Worcester, Ventilators.—7,280, G. W. Potter, London, Door Letter-boxes.—7,300, J. Hays, Ashton-under-Lyne, Sanitary Rectangles.—7,304, D. H. Brandon, London, Asbestos Compound for use as Sheathing for Roofings, &c. Com. by D. A. Brown, Boston, and C. F. Brigham, Worcester, U.S.A.—7,305, D. H. Brandon, London, Fire and Water-proof Material on Roofings, &c. Com. by D. A. Brown, Boston, and C. F. Brigham, Worcester, U.S.A.—7,319, W. B. Olin, Great Yarmouth, Combined Cassment Stay and Fastener.—7,337, C. M. Tate, London, Ventilation, &c.—7,342, C. Toope, London, Fireproof Blocks for Buildings, &c.

May 7.—7,350, G. Potter and G. W. Potter, London, Securing Rain-water Pipes.—7,356, E. Loftis, Cambridge, Fireplaces.

May 8.—7,385, J. A. Jones, Middlesbrough-on-Tees, Concrete or Artificial Stone.—7,399, S. Belham and J. D. Belham, London, Chimney-pot.—7,400, S. Belham and J. D. Belham, London, Preventing Down-draught in Chimneys.—7,413, J. Rust, London, Vitreous Cement.

SPECIFICATIONS ACCEPTED.†

May 6.—1,029, F. F. Brown, Chester, Parquet Floors, &c.—3,346, J. Partridge, London, Bracket

* Compiled by Hart & Co., Patent Agents, 168, Fleet-street.

† Open to public inspection for two months from the dates named.

for Roller-blinds.—5,698, W. P. Thompson, Liverpool, Waterproof Flooring, Com. by A. Damman and A. Cassard, Brussels.
May 9.—3,846, W. J. Mason and G. Swann, London, Warming Buildings.—5,049, E. W. Harcourt, Nuneham Park, Chimney Cowl.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending May 10, 1884.

4,469, A. M. Clark, London, Preventing the Spread of Fire from one part of a building to the other. Com. by W. H. Dolman, St. Helen's, U.S.A. (Sept. 18, '83, price 2d.).

Sheets of iron are attached to the lower sides of the joists, and earth or dry ashes are filled in between the joists above the iron. The laths for the ceiling plaster below are secured at a little distance below the iron. (Pro. Pat.)

4,586, A. Barker, London, Bracket for Seats, Shelves, &c. (Sept. 26, '83, 6d.).

This bracket is a telescopic hold-on rod, the larger tube being pivoted on the floor and the smaller tube to the seat, &c. When the seat is let down the small tube slides inside the large one until it comes to the bottom thereof, when the seat is supported in position.

MEETINGS.

SATURDAY, MAY 17.

Architectural Association.—Visit to a House in Kensington-court (Mr. T. G. Jackson, architect). 3 p.m.
St. Paul's Ecological Society.—Visit to City Churches (St. Katherine Cree and All Hallows, Barking), under the auspices of Mr. G. H. Birch, A.R.I.B.A. Members to assemble at St. Katherine's at 3 p.m.
Edinburgh Architectural Association.—Visit to Dalnaly House, Barabougie, and Dundas Castles.

MONDAY, MAY 19.

Royal Institute of British Architects.—Mr. W. Emerson on "Some Newly-erected Buildings at Allahabad and Bownagur." 8 p.m.
Surveyors' Institution.—Mr. H. H. Smith on "The Inclosure and Regulation of Commons." 8 p.m.
Victoria Institute.—Mr. J. Hassell on "Evolution." 8 p.m.
Society of Arts.—Prof. W. Noel Hartley on "Fermentation and Distillation." (II.) 8 p.m.

TUESDAY, MAY 20.

Statistical Society.—Mr. O. Walford on "A Statistical Review of Canada, including its Confederated Provinces." 7.45 p.m.

WEDNESDAY, MAY 21.

British Archaeological Association.—Mr. E. Walford, M.A., will read a paper by Signora Campion on "The Ancient Port of Luni." 8 p.m.
Society of Arts.—Lieut.-Col. C. E. Webber, R.E., on "Telegraph Tariffs." 8 p.m.
British Museum.—*Early English or Anglo-Saxon Antiquities*. (V.) The Horn. 8 p.m.
Royal Meteorological Society.—Five papers to be read. 7 p.m.

THURSDAY, MAY 22.

Builders' Benevolent Institution.—Election of Pensioners, Willis's Rooms St. James's. 2 to 4 p.m.
Society of Telegraph-Engineers and Electricians.—Mr. W. H. Freese, F.R.S., on "The Electrical Congresses of Paris." 8 p.m.
Royal Institution.—Professor Dewar on "Flame and Oxidation." (V.) 3 p.m.
Society of Arts.—*Applied Chemistry and Physics Section*.—Mr. Edward C. Stanford, F.R.S., on "Economic Applications of Seaweed." 8 p.m.

FRIDAY, MAY 23.

Royal Institution.—Dr. David Gill, F.R.S., on "Recent Researches on the Distances of the Fixed Stars." 9 p.m.

Miscellaneous.

London and Middlesex Archaeological Society.—The usual monthly meeting of the members of this society took place on Monday evening last, the 12th inst., at No. 4, St. Martin's-place, Trafalgar-square, Mr. J. G. Walker in the chair, when a paper was read by Mr. Thomas Milbourn, architect, entitled "Biographical Notices of Eminent Members of the Drapers' Company who have Passed the Civic Chair." The proceedings closed with a vote of thanks to Mr. Milbourn for his paper.

Hitchins Fireproof Plastering Company, Limited.—Some of our readers will be acquainted, from the notices of experiments which have appeared in our columns from time to time, with the merits of Hitchins' fireproof plastering. By an advertisement in our present issue it will be seen that the company now in write application for the remainder of the shares at par. We are informed that the company is in full work, with numerous heavy contracts and daily increasing orders.

Glazing.—The "Dennis system" of patent glazing, intended especially for roofs, of which diagrams have been sent to us, has a good deal to recommend it; especially the "metal sink bar without putty" for roofs of railway stations, and other large areas of glazing; the construction is simple and scientific.

New Business Premises in Farringdon-street.—Messrs. Marcus Ward & Co. will shortly remove from their present premises in Chandos-street to the new premises which have just been erected for them in Farringdon-street. The new buildings, which form a prominent architectural feature on the east side of the street, have a frontage of 64 ft. in length, and are 82 ft. in height to the apex of the principal gable. The elevation is faced with red Fareham brick, terra-cotta being profusely introduced for dressings and ornamentation. The building contains five main floors, together with a sixth floor within the gable. The ground-story portion of the frontage is entirely in terra-cotta, having in the centre an arched gateway 10 ft. in width, leading into a spacious open area at the rear of the premises. The spandrels of the arch of this gateway are elaborately decorated with ornamental terra-cotta devices. The principal entrance to the building is through an archway at the north side of the frontage, uniform in style and width with the gateway just described. The first, second, and third floors have each ranges of from two and three light mullioned windows, all in terra-cotta. The first-floor windows are segment-headed. The building is carried back to a depth of 108 ft., and occupies a ground area of about 7,000 ft. The principal business apartments on the ground and three upper floors are each 74 ft. long, and 24 ft. wide, each floor having abundance of light from spacious and lofty windows on the sides of the open area. Mr. G. Vickery, of Adde-street, City, is the architect, and Mr. W. Brass, of Old-street, is the contractor. Messrs. Doulton, of the Lambeth Potteries, have supplied the terra-cotta; and the ironwork has been furnished by Messrs. Young & Co., of the Eccleston Works, Pimlico. Mr. F. Eborall is foreman of the work.

Building Sites in Eastcheap and the Inner Circle Railway Completion.—Last week, at the Auction Mart, Messrs. Debenham, Tewson, & Co., submitted for letting, on a lease of eighty years, the surplus land of the Metropolitan, and Metropolitan District Companies at the corner of St. Mary-at-Hill, Eastcheap, the site containing an area of 1,755 ft. There was a large company present, and the auctioneer, in offering the property, alluded to the great value, during many years past, of property in that part of the City, which, he observed, was now still further increased in consequence of the widening of Eastcheap. There was a close and warm competition for the land as a building site, the biddings commencing with an offer of 600l. per annum, and the land was ultimately let for 1,200l. a year.

Forest Hill.—The foundation-stone of the Forest-hill Baths—a building which we illustrated in the *BUILDER* for Dec. 1, 1883—was laid on Saturday last by Mr. T. W. Williams, ex-chairman of the Baths Commissioners. There was a great gathering on the occasion, and speeches were made by Viscount Lewisham, the Rev. H. Stevens, and others. The stone was laid by Mr. Williams with a silver trowel, presented by the architects, Messrs. Wilson, Son, & Aldwinckle. On the same day the Boys' Industrial Home, called "Shaftesbury House," from the design of the same architects, was formally opened by the Lord Mayor.

Thames Communication.—The hybrid Committee appointed to inquire into the means of communication north and south of the Thames below London Bridge met yesterday, and elected Sir Sussex Vivian chairman. The Committee decided to meet for the purpose of hearing evidence at noon on Monday next, when the evidence to be tendered by the Metropolitan Board of Works in support of their proposed subway will be taken first, and will be followed by that in support of the Tower (Duplex) Bridge.

Stock Exchange: East Addition.—Referring to our notice of this building in last week's issue of the *Builder* (page 662), we are asked to mention that the Pavonazetto and other marbles, including chimney-pieces, were supplied by Messrs. Farmer & Brindley, of Westminster-bridge-road, who are also executing the carving, external and internal.

A Correction.—In the notice of some new buildings in Northumberland-avenue in our last "Miscellaneous," p. 668, the name of Mr. Martin, joint architect with Mr. Bassett Keeling, of some residential chambers in that street, is given as Mr. C. D. Martin. It should have been G. D. Martin.

New Bank Buildings at Balham. The London and South Western Banking Company have just completed the erection of a new branch bank at Balham, which is intended to be opened for business in about a fortnight. The building, which faces the Balham highway, and immediately adjoins the station of the London and Brighton Railway Company, has a frontage 48 ft. in length, the elevation being faced with Portland and Bath stone, and having bold entrances at each angle, surmounted by elaborately carved pediments resting on polished grey granite columns. The banking apartment is lighted by four ornamentally-carved arched windows, above which is a balcony and balustrade at the foot of the first-floor windows. There is a return frontage on the south side, mainly uniform with that facing the Balham-road. The banking-room is a spacious apartment, 35 ft. long by 18 ft. wide, and the floor is laid with encaustic tiles. At the rear of the banking apartment are the manager's and clerk's offices. The upper floors contain the basement are the two strong rooms, which have been fitted by Milner's Safe Manufacturing Company. The iron doors supplied by Milner's Company are respectively 7 in. and 8 in. in thickness, and of great weight. The walls of the strong rooms, which are fireproof, are 18 in. in thickness, the materials being iron, concrete, and fire-brick. The architect of the building is Mr. Charles Bell, of New Broad-street, and Messrs. J. Smith & Sons, of Norwood, are the contractors. Mr. E. Hodge is foreman of the works.

Sanitary Assurance Association.—At a meeting of the Council of this Association, held at 5, Argyl-place, Regent-street, on Monday last, Sir Joseph Fayrer, F.R.S., in the chair, a discussion took place on the International Health Exhibition, in connexion with a letter from Mr. H. Rutherford, of the Temple, and on the motion of the chairman, seconded by Lieut.-General Burne, C.B., it was resolved,—
"That the medical officer, Dr. James Stevenson, and the sanitary surveyor, Mr. Mark H. Judge, A.R.I.B.A., be instructed to visit the various departments of the Health Exhibition connected with the drainage and water supply of dwelling-houses for the purpose of reporting on the same to the Council and members of the Association." The following resolution was also passed, on the motion of Mr. Barrington Kennett, seconded by Mr. Mark H. Judge:—"That certificates be given to builders and plumbers who, having executed sanitary works under the direction and supervision of the Association, have completed the same to the satisfaction of the medical officer and the sanitary surveyor."

Building Societies in Australia.—There are in Sydney, the metropolis of New South Wales, between twenty and thirty land and building societies, with share capital ranging from 2,000l. to over 260,000l. The members belong principally to the labouring and small shop-keeping classes, many of whom are the owners of the houses in which they reside and the land on which they are built. The share capital of the various societies amounts, in round figures, to nearly a million sterling. The deposits amount to about another million. The borrowers are charged about 8 per cent. on the amount of their loans, this being regarded as fair, being the same as 5 per cent. in England. The advances made during the past year reached nearly three quarters of a million. The whole of the money thus borrowed was for the purpose of investing in land or house property, and it is estimated to average about 12l. per head of the wage-earning community. There are also building societies at Goulburn, Maitland, and other parts of the colony. As a rule, the societies are permanent, very few being based on the terminating principle.

West London School of Art.—Mr. Alfred C. Weatherstone, a student of the West London School of Art, has been awarded the "Mence Smith Travelling Studentship" for 1884, of the value of 50l. Mr. Weatherstone will be required to proceed in the autumn to Italy, for the purpose of making sketches of and studying coloured decoration.

Chesertown.—A large clock has just been fixed in Chesterton Church, Oxfordshire. It is fitted with all the latest improvements, strikes the hours upon a 14-cwt. bell, chimes the quarters, and shows time on one skeleton dial. It is the gift of Miss Drake, of Bignell House, and Messrs. John Smith & Sons, Midland Clock Works, Derby, have carried out the work.

The Tilbury Docks Estate: Important Sale of Building Sites.—There was a very large attendance at the Auction Mart on Tuesday last, the occasion being the sale of the first portion of the Tilbury Docks Building Estate. This estate, consisting of 66 acres, has been purchased by the Lands Allotment Company, in anticipation of the opening of the Tilbury Docks, now in course of construction, and they have laid out the estate for building upon by the formation of ten roads, of 50 and 40 feet in width. The sale on Tuesday contained 28 plots, comprising an area of over six acres, with total frontages of 3,878 feet. Mr. Bradshaw Brown, the auctioneer who conducted the sale, dwelt upon the great value of the property, observing that the position of the land, which was in immediate contiguity to the docks now in progress, offered exceptional advantages for the erection of shops, warehouses, and business or manufacturing premises, for which there was sure to be a large demand as soon as the docks were opened, which, it was expected, would be in the early part of next year. He added that the South Essex Water Company had made arrangements for an immediate supply of water to the estate, and observed that, as there was a certainty of Tilbury becoming a largely populated town with the opening of the docks, there could be no doubt that a rapid increase in the value of land for building purposes must take place. The first lot offered consisted of an hotel and tavern plot, having frontages of 62 feet and 42 feet respectively to Manor-road and Dock-road; but 1,600l. being the highest offer the property was withdrawn, as also the next two lots, which were likewise hotel and tavern plots, these three plots being the only sites on which taverns would be permitted to be erected on the estate. The twenty-five remaining lots were then offered in succession, when seven of the lots were sold at prices ranging from 4l. to 5l. per foot frontage, the entire proceeds of the day's sale amounting to upwards of 5,000l.

Edinburgh Architectural Association. The usual fortnightly meeting of the Association was held in the hall of the Edinburgh Institution, Queen-street, on the 12th inst., the use of which was kindly granted by the lecturer. After the usual preliminary business, the president, Mr. Daniel McGibbon, introduced Dr. R. M. Ferguson, who delivered a lecture, entitled "A few Notes on Electric House Fittings, with a short Review of the Conditions to be observed in Lightning Conductors, Electric Bells, and Wires for Electric Light," in which he stated that, qualitatively, the lightning-conductor was founded on scientific principles, but that quantitatively its construction was guided by experience, and, to some extent, even by guess-work. He next described one or two buildings that had been recently furnished against lightning by the most experienced savans. It was insisted that periodical inspection of lightning conductors was a necessity, as a faulty conductor is dangerous not only to the house it was on, but to others near it. The relative merits of mechanical and electric bells were discussed, and some practical details given of the latter. In speaking of incandescent electric lights, the lecturer remarked that the German word "glow-light" was shorter, more graphic, and quite as good as an English term, and should be adopted. He also described the instalment of Edison's glow-lights in Buckholm Mill, Galashiels, the first mill so lighted in Scotland. In point of intensity the glow-light looks like bright gas, but in the mill referred to it is found that colours can be better distinguished by it. The various systems of electric bells were exhibited in action by Messrs. Brydone & Son, of George-street, and the room was lighted up by Edison and Swan's sixteen-candle lights. At the conclusion a very hearty vote of thanks was accorded to Dr. Ferguson.

Congregational Church, Wimbledon.—We are asked to mention that the cast-iron columns for the aisles of this building, which was referred to in our last (p. 664), were supplied by Messrs. Arthur Hill & Co., of St. Martin's-lane, Charing-cross.

TENDERS.

For further works for the Stock Exchange in Old Broad-street. Mr. J. J. Cole, architect. Quantities by Mr. James Barnett, of 99, Cannon-street.—

Chappell	223,690 0 0
Trolope & Son	22,292 0 0
Ashby Bros.	22,110 0 0
Brass	22,100 0 0
Colls & Sons	21,800 0 0
George Shaw (accepted)	20,628 0 0

For the erection of a dwelling-house, East-lane, Bermondsey-vale, for Mr. W. W. Wilkins. Mr. E. Crose, architect, 35, Bermondsey-square, S.E. Quantities not supplied.

B. Wells	2,850 0 0
T. & F. Drake	649 0 0
J. Almond	644 0 0
J. Bullers	638 0 0
R. Russell (accepted)	638 0 0

For alterations and additions to Brixton Hall, Acre-lane, Brixton. Messrs. Fowler & Hagman, architects. Quantities by Messrs. Fowler & Hagman.—

Foster	45,710 0 0
Nightingale	5,572 0 0
Pack Bros.	5,559 0 0
Stimpson	5,640 0 0
Colls	5,388 0 0
Downs	5,113 0 0

For road and sewers at High Barnet for Mr. Bruce Johnson. Mr. Walter Grave, surveyor.—

William Maxwell	2,751 19 3
Ambrose Oliver	730 0 0
Marratt Bros.	713 0 0
Roseland Lane	686 0 0
C. Killingsby	645 0 0
P. G. Pound	597 0 0
George Bell	591 0 0

For pulling-down and rebuilding shop and dwelling-house, No. 20, Upper-street, Islington, for Mr. J. F. Stanley. Mr. K. D. Matthews, architect. Quantities by Mr. J. F. Stanley.—

Doro Bros.	21,175 0 0
Sahey & Sons	1,090 0 0
E. Lawrence	1,075 0 0
Bywaters	1,043 0 0
H. & E. Lea	927 0 0
Toms	927 0 0

For alterations and additions to premises at Thornhill-bridge, Caledonian-road, N., for Messrs. Thorley & Co. Mr. R. M. Shaw, architect.—

Purton	21,139 0 0
Williams & Son	1,123 0 0
Spencer & Co.	1,015 0 0
Taylor	985 0 0

For business premises, South-street, Romford, for Mr. G. B. Gibbey. Mr. J. W. Steven, architect and surveyor, Dyer's-buildings, Holborn.—

Bath Stone	* +
A. Reed, Stratford	21,570 0 0
G. F. Williams, Fimbo	1,969 60 63
W. North, Stratford	1,288 30 37
W. Wood, Chelmsford	1,286 31 60
J. Hammond, Romford	1,247 28 34
J. K. Coleman, Poplar	1,234 110 95
J. W. Holland, Poplar	1,187 35 25
J. Johnstone, Limehouse	1,169 62 72
G. Pryor, Hornsey	1,150 31 30
North Bros., Stratford	1,126 22 26
England & Thompson, Leyton	1,065 35 30

* Extra for Portland stone.
† Extra for Red Corsehill.

For repairs at two houses at Essex-road, Acton. Mr. T. Willis, architect.—

Jas. A. Taylor, Wilsdon-street, Haggerston (accepted)	2,240 0 0
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[No competition.]

For building coachhouse and stable at Clapham-park for Mr. E. Jones.—

J. A. Taylor, Haggerston (accepted)	2,379 0 0
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For additions to House, Leigham Court-road, Streatham-hill, for Mr. Margetson. Mr. R. M. Shaw, architect.—

McNee	21,597 0 0
Candler	1,460 0 0
J. A. Taylor, Haggerston (accepted)	1,429 0 0

For additions to premises Thornhill-bridge, Caledonian-road, for Messrs. Joseph Thorley & Co. Mr. R. M. Shaw, architect.—

Purton	21,139 0 0
Williams	1,123 0 0
Spencer	1,015 0 0
J. A. Taylor	985 0 0

For additions, alterations, and repairs to the Red Lion Inn, High-road, Kibbura. Mr. W. Elson architect. Quantities not supplied.—

Canning & Mullen	2,285 0 0
J. B. Colville	270 0 0
Tanner & Hodge	145 0 0

For making roads and sewers at Freemason-lane, West Ham, for Mr. A. Barnett. Mr. Banister Fletcher, architect and surveyor.—

Thomas Adams (accepted)	21,300 0 0
Thomas Adams (accepted)	658 0 0

For three houses with shops in High-street, Peckham, for Mr. G. R. Le Pays. Mr. C. Barnard, architect.—

Sharman	22,800 0 0
Canning & Mullen	2,765 0 0
Falkner	2,745 0 0
W. Downs	2,717 0 0
Stafford	2,715 0 0
Baslam Bros.	2,620 0 0
R. & E. Evans	2,615 0 0
Mar-john	2,595 0 0
Tarrant & Son	2,574 0 0
F. Higgs	2,560 0 0
D. D. & A. Brown	2,480 0 0
W. & F. Crocker	2,359 0 0
Burman & Sons	2,397 0 0

For villa residence in Ditton-road, Surbiton, Surrey, for Mr. E. Ridgers. Mr. C. Barnard, architect.—

Marsland	2,892 0 0
W. & F. Crocker	795 0 0
Johnson	760 0 0
Foster	680 0 0
Parsons	590 0 0
Judd	645 0 0

For the erection of depot at Stratford for Messrs. Carter, Paterson, & Co., under the superintendence of Mr. William Eve, 10, Union-court, Old Broad-street.—

Rene	42,964 0 0
Mortet	2,896 0 0
Higgs	2,790 0 0
Dowds	2,734 0 0
Harris & Wardrop	2,752 0 0
Perry	2,760 0 0
D. D. & A. Brown, Camberwell	2,732 0 0
green (accepted)	2,732 0 0

For alterations and additions to the premises No. 117, High-street, Stoke Newington (corner of Dymock-road) for Mr. F. J. Millman. Mr. R. A. Lewcock, architect and surveyor, 58, Bishopsgate-street Within.—

S. Goodall (accepted)	2,312 0 0
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For works and additions at 26, Thavies Inn, Holborn, for Mr. Abraham Lazarus. Mr. Lewis Solomon, 7, Gray's Inn-square, architect.—

Butchers, Bloomsbury	2,165 0 0
Triggs, Prescot-street (accepted)	157 0 0

For five houses in Denzie-road, Guildford, for Mr. Wm. Eggleston. Mr. A. B. Harding, architect.—

G. & R. Smith	21,185 0 0
Curington & Feto	1,135 0 0
Elliott	1,093 0 0
Strudwick (accepted)	993 0 0

For rebuilding Nos. 10 and 11, Hinds Bridge, Sunderland. Mr. J. R. Prosser, architect.—

Robert Hudson, jun.	2,888 0 0
R. M. Fairclough	849 10 0
George Young & Sons	807 12 0
D. J. Rankin	760 0 0
Joseph Huntley, 61, Tower-street West (accepted)	726 12 0

[All of Sunderland.]

For proposed school-room, &c., in rear of Baptist Chapel, Commercial-road, Oxford. Mr. J. C. Gray, architect, Cowley-road, Oxford.—

Wilkins & Sons	2,748 0 0
Gray & Fisher	721 1 4
T. H. Kingerlee	659 0 0
J. Horn	657 0 0
T. Selby	653 0 0
G. Castle	620 0 0
Castle & Martin	600 0 0
Lambert & Loxley (accepted)	600 0 0

For the erection of cottages at Chesham, Bucks, for Mr. Patterson. Mr. Wm. Huckvale, architect.—

Bowden	4,569 0 0
Honour & Son, Tring (accepted)	500 0 0

For the erection of a house at New Mill, Tring, for Mr. A. Mead. Mr. Wm. Huckvale, architect.—

Honour & Son	2,392 10 0
Fincher & Smith	389 0 0

For cottages and shop at Chesham, for Mr. D. Rance.—

Honour & Son	2,345 0 0
Harding	616 10 0
Bowden	537 0 0

For coal hoppers and stages at Nine Elms. Mr. Henry Adams, C.E., engineer and surveyor.—

Lucas Bros.	26,950 0 0
Thomas Little	5,778 0 0
Clarke & Bracey	6,888 0 0
Hall, Beddall, & Co.	5,583 0 0
Bangs & Co.	5,290 0 0
Nightingale	5,247 0 0
W. J. Hack (accepted)	5,125 0 0

For offices and residences at Nine Elms. Mr. Henry Adams, C.E., architect and surveyor.—

Lucas Bros.	2,803 0 0
Hall, Beddall, & Co.	705 0 0
Thos. Little	646 0 0
Bangs & Co.	598 0 0
Clarke & Bracey	593 0 0
Nightingale	587 0 0
W. J. Hack (accepted)	553 0 0

For new roads and sewers at Hampstead, Messrs. Face-brother, Ellis, Clark, & Co., surveyors, Lancaster-place, Strand.—

Rogers & Wickens	21,320 0 0
Culverhouse	11,300 0 0
Watts	11,216 0 0
Wilson	10,978 0 0
Killingback	10,610 0 0
Nowell & Robson	10,622 0 0

For road and sewer works on the Hampstead Estate, in continuation of Cauldwell Gardens to Fairhazel Gardens. Messrs. Facebrother, Ellis, Clark & Co., surveyors.—

Culverhouse	21,525 0 0
E. Wilson	1,610 0 0
Nowell & Robson	1,483 0 0
Watts	1,469 0 0
Bell	1,467 0 0
Rogers & Dickens	1,433 0 0
Killingback	1,439 0 0

For alterations at The Lord Portman Public House Broadly-terrace, Blomfield-square, for Mrs. Fanny Cowlin. Mr. H. J. Newton, architect, 17, Queen Anne's Gate.—

Cook	2,971 0 0
Roy-l	860 0 0
Walker	858 0 0
Steel Bros.	828 0 0
Lumbe	769 0 0
Godden (accepted)	766 0 0

Peetere's Work.

Davidson	100 0 0
Sanders	83 0 0
Hellings	81 0 0
Heath (accepted)	77 0 0

For the erection of ladies' and gentlemen's dressing-rooms, &c., on the Lawn-tennis Ground, Cumberland Park Estate, Acton. Mr. Alfred Wright, architect and surveyor, 184, Bromley-road.—

T. Bray	2,175 0 0
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For works of drainage, &c., on the Wright's Park Estate, Hornsey, for the Hornsey Local Board. Mr. T. de Coney
Made, engineer and surveyor:—

Contractors' Names.	Contract G. Tank Sewer.	Contract H. Sewers, &c., Burghley Road.	Contract I. Sewers, &c., Vernon Road.	Contract J. Sewers, &c., Walgrave Road.	Contract K. Pumping Station, Burghley Road
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Kerry & Son, Highgate	1,070 18 9	138 11 6	133 1 8	131 19 0	200 0 0*
Wilkinson, Bros., Finsbury Park	1,074 0 0	141 0 0	138 10 0	142 0 0	214 12 4
Cook & Co., Lavender-hill	1,119 0 0	127 0 0*	122 0 0*	123 0 0*	225 0 0
Pizzey, Hornsey	1,129 19 5	119 11 6	140 8 11	143 5 0	263 0 0
Dunmore, Hornsey	1,147 0 0	119 0 0	143 0 0	150 0 0	216 3 5
Iles, Wembleton	1,145 0 0	123 0 0	162 0 0	162 0 0	260 0 0
Jackson, Finsbury Park	1,161 0 0*	200 0 0	195 15 0	198 0 0	227 13 5
Bell, Wood-green	1,613 0 0	155 5 0	162 0 0	165 10 0	275 7 0
Hill, Highgate	—	—	—	—	317 11 9

* Accepted.

For the erection of new transepts, &c., at St. John's
Wood Presbyterian Church. Messrs. William Wallace &
Flockhart, architect. Quantities supplied by Mr. Fred.
Thompson:—

Dowling & Sons	£1,374 0 0
Simpson & Son	1,160 0 0
Taverner & Son	1,121 0 0
Benstead & Sons	1,063 0 0
Robertson	810 0 0

For the erection of stables in Battersea Park-road, for
the Wandsworth Board of Works:—

Bottoms	£262 0 0
Torkington	618 0 0
Walkley	475 0 0
Cook & Co.	470 0 0
King	470 0 0
Howard	455 0 0
Jones	452 0 0
Higgett & Brown	440 0 0
Baker	420 0 0
Kidness & Mount	397 10 0

For the erection of a wall round Christ Church, Batter-
sea, for the Wandsworth Board of Works:—

Dickenson	£1,224 0 0
Howard	1,151 0 0
Walkley	1,141 0 0
Jones & Co.	1,080 0 0
King	1,075 0 0
Higgett & Brown	953 0 0
Bottoms	890 0 0
Rubens & Mount	725 0 0

Accepted for alterations for the Egyptian Cigarette
Company. Mr. H. J. Newton, architect:—

Golden	£350 0 0
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For repairs at the Licensed Victuallers' Schools, Ken-
nington-lane, for the Incorporated Society of Licensed
Victuallers. Mr. H. J. Newton, architect:—

Golden	£382 0 0
Stirling	275 0 0
Lamble	233 0 0
Royal	216 0 0
Cook	189 0 0
Crabtree (accepted)	155 0 0

For erecting forty-two houses at Cork, for the Cork
Improved Dwellings Company, Limited. Mr. W. H. Hill,
B. E., architect:—

T. O. Flynn	£5,000 0 0
E. & P. O. Flynn	4,999 0 0
R. Ryans	4,746 0 0
E. Fitzgerald	4,378 0 0
E. Longfield	4,369 0 0
J. Delany	4,103 0 0
Samuel Hill	3,797 0 0
[All of Cork.]	—

For building new house and other works at the Butchers'
Charitable Institution, Walham Green. Quantities sup-
plied:—

Stoner	£261 0 0
Kilby & Gayford	907 0 0
W. Oldrey	893 0 0
Nightingale	863 0 0
Harris	737 10 0

For alterations, &c., to house in Hamilton-terrace. Mr.
Lewis Solomon, 7, Gray's Inn-square, architect:—

Robinson	£1,347 5 0
Bywater	1,269 0 0
Vernall & Griffiths	1,180 0 0
Davey	1,160 0 0

Accepted for building cement kilns at Rainham, Essex,
for the Rainham Portland Cement Company, Limited:—
G. Gates, Frindsbury, Rochester. £1,370 0 0

For repairs to streets and footpaths at Dartmouth, for
the Town Council. Mr. E. H. Back, borough surveyor:—
Liller & Sons, Dartmouth. £330 0 0
Ferris 320 0 0 || Tucker, Blackawton (accepted) | 262 10 0 |

[Surveyor's estimate, 292.]

For proposed extensions at St. John's Schools, Dakin-
field, Cheshire. Mr. Gregory Gill, Stalybridge, archi-
tect and surveyor. Quantities prepared by the archi-
tect:—

	No. 1.	No. 2.	No. 3.
Garside, Barns, & Co.	£453	£395	£390
Wm. Storrs, Sons, & Co.	449	369	61
Limited	440	380	53
Castle Hall Saw Mills Co.	440	394	54*
James Crooks	—	—	—

* Accepted for Nos. 1 and 3, 503l. 7s.

Repairs, Potomac-rose. — Respecting some tenders
published on p. 670 of last week's Builder, Messrs. Hay
ward & Son, of 88, Newgate-street, write to say that
No. 16 was entrusted to Mr. Woodward, and Nos. 15 and
17 to them.

Special Notice.—Lists of tenders frequently reach us
too late for insertion. They should be delivered at our
office, 46, Catherine-street, Strand, W.C., not later than
four p.m. on Thursdays.

TO CORRESPONDENTS.

J. W. B.—H. A.—W. R. L. (write to Secretary of Surveyors'
Institution, 22, Great George-street, S.W.)—A. J. B. we cannot
undertake to give publicity to your crudely-expressed and somewhat
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Supplement to The Builder,

MAY 17, 1884.

GENERAL CONFERENCE OF ARCHITECTS.



THIS week conclude our very full report of the proceedings of the Seventh General Conference of Architects, held in London last week, and to which we have already devoted a supplement and some other pages.

On Thursday, the 8th inst., visits were paid to the new Church of the Oratory, Brompton; to the new Central Technical College at South Kensington; and to Stafford House and some other West-end mansions. In the evening the President and Council received the members and their guests at a *Conversazione* in the South Kensington Museum. Notices of these several gatherings will be found on another page.

On Friday, the 9th inst., the Conference Fifth Meeting was held, Mr. Arthur Cates in the chair, when

Mr. R. Phené Spiers, Master of the Architectural School at the Royal Academy, read a paper

ON THE FRENCH DIPLÔME D'ARCHITECTE AND THE GERMAN SYSTEM OF ARCHITECTURAL EDUCATION.

The communication which I have been asked to make on the French architectural diploma and on German architectural education is the outcome of a discussion which took place at the Royal Institute of British Architects on February 4th this year, after the reading of a paper by Mr. William H. White, the subject being "A brief Review of the Education and Position of Architects in France since the year 1671." This paper, and the discussion which followed it, have been fully reported in the first half of the "Transactions" of the Institute for the present session, just published.*

The latest regulations for the courses of study of the *École des Beaux-Arts*, and the qualifications for the *Diplôme d'Architecte*, are fully set forth in the *Journal Officiel de la République Française* of October 10th, 1883. I propose now to give a summary only of these, but would suggest that a translation in full ought to appear in the Institute "Transactions" for reference. I have further obtained information from various sources as to the working of the Diploma, and a list of the subjects for design given since its establishment in 1869. The summary I propose giving will be in some measure the complement of the remarks I made in the discussion following Mr. White's paper, when I confined myself chiefly to a description of an *atelier* and the working out of the designs therein under the advice of the Principal or *Patron*. As the *Diplôme* examinations can be passed only by those who have obtained certain *valeurs* or marks in the first class or upper division of the *École des Beaux-Arts*, I am obliged to describe the curriculum of the obligatory courses of study there before specifying those referring to the *Diplôme* alone.

The *École des Beaux-Arts* affords gratuitous instruction to all comers, whether Frenchmen or belonging to other nations, between the ages of fifteen and thirty, on condition of their passing an examination. This examination takes place twice a year, in March and in July, and is divided into two sections; the first consisting of a drawing from the cast (either ornament or head of figure) made in the school in eight hours; of a model in clay of an ornament in bas-relief, also in eight hours; and of an architectural design to be executed from a programme given at the time in twelve hours. Those only who satisfy the examiners as to the first test can pass on to the second, which consists—1st, Of a written examination in arithmetic, algebra (including quadratics and logarithms) and geometry; 2nd, an oral examination in the same; 3rd, an examination in descriptive geometry; 4th, a written examination in history, followed by an oral examination in the same. Those who pass this second test become students of the second class of the school, and are placed according to the number of marks received in the examination.

The course of study in the second class consists of—1st, *Concours d'Architecture*, or competitions in architectural design; 2nd, *Concours* in construction, mathematics, &c.; 3rd, drawing from the ornamental cast, modelling from the cast (bas-relief only), and drawing from the antique figure. The first, or *Concours d'Architecture*, consists each year of the following courses:—

a. Six studies of the orders or portions of the same to a large scale shaded in Indian ink. (In explanation of these studies I may note that it was found that many of the students entered the school with very little knowledge of the ancient styles of architecture, and very little power of drawing them; to remedy these defects the new regulations require drawings of detail to a large scale, shaded in Indian ink, such drawings including studies of the orders, and of sundry details, as doorways, windows, cornices, &c. This obliges the student to be a good draughtsman, and to have some acquaintance with ancient architectural styles before he attempts to design.)

b. Six complete designs (plans, elevations, and section), the original sketch being made in the school in twelve hours, and retained by the authorities. Before being allowed to compete in this course, at least two mentions must be obtained in the first course (analytical studies).

c. Six sketch designs finished in colours and made in the school in twelve hours.

d. Two studies in ancient architectural styles, the programme for which is set by the Professor of History.

The second series of studies consists of:—

a. A course of lectures in mathematics and mechanics, followed by an examination partly written and partly oral.

b. A course of lectures on descriptive geometry.

c. A course of lectures on stereotomy, surveying, and levelling.

d. A course of lectures on perspective.

These three courses are accompanied by the requirement to make a certain number of *épreuves* or drawings in the *atelier*, illustrating the course, and followed in each case by an *épreuve* or drawing made in the school *en loge* in twelve hours, and by an oral examination; and lastly,—

e. A course of lectures in construction, followed (at intervals during the year) by studies in stone, wood, and iron construction, sketches for which are made in the school in twelve hours, followed by a complete set of drawings in each subject, done in the *atelier* in fourteen days, and one "concours de construction générale," in which the working-drawings for a building are worked out with specification complete as if it were going to be constructed, three months being allowed to make the drawings in, the original design being made in the school in twelve hours. A *viu-d-voce* examination of every student is held in explanation of the drawings submitted in each of the above courses.

The third series of studies consists of drawings from the plaster-cast of ornament, modelling in bas-relief from the cast, and drawing of the antique figure. Twelve hours is given for the execution of any one drawing or model, done at the student's leisure, and not necessarily in one, two, or three sittings. At least two of each of these are required to obtain the medal or mention necessary for passing to the first class, and the Professor of Drawing

decides when the drawings or models are good enough to be submitted to the jury.

The courses of study thus cited take about three years to go through; that is to say, that an average student giving all his time can obtain a sufficient number of marks or *valeurs* in three years to enter the upper school.

The recompenses given are:—

For the *Concours d'Éléments Analytiques* (studies of the Orders), half-mentions.

Projets rendus (finished drawings), whole and half-mentions.

Esquisses (sketch designs), half-mentions.

Mathematics, descriptive geometry, stereotomy, and perspective, third medals and mentions in each.

For construction, first, second, and third medals and mentions.

For drawing of ornament, antique-figure, for modelling, and for studies of history, third medals and mentions.

The values of these recompenses in second class are:—Half or second mentions, 1 *valeur*; 1st mention, 2 *valeurs*; 3rd medal, 3 *valeurs*; 2nd medal, 4 *valeurs*; 1st medal, 5 *valeurs*.

To enter the upper school it is necessary to have obtained six *valeurs* in architectural design, medals or mentions in mathematics, descriptive geometry, stereotomy, construction, and perspective; a medal or mention in drawing of ornament, modelling, and drawing of the figure.

In the first class of the school in each year the courses of study consist of:—

Six competitions in Architectural Design,—finished drawings (*projets rendus*).

Six competitions in Architectural Design,—sketches design only (*esquisses-esquisses*).

One competition of Composition in Ornament. (Done in the school in seven days.)

Two competitions of Design in Architecture reproducing a style selected by the Professor. (The sketches for which are done in twelve hours *en loge* and the drawings made in ten days in the *atelier*.)

Two competitions in Drawing from the Figure. (Twelve hours each.)

Two competitions in Modelling of Ornament. (Two hours each.)

The recompenses are:—

For architectural design, finished drawings,—1st medals, 2nd medals, and 1st mentions.

For architectural design, sketches,—2nd medals and 2nd mentions.

For ornament and design in selected styles,—1st medals, 2nd medals, and 1st mentions.

For drawing of figure and modelling,—1st medals, 2nd medals, and 2nd mentions.

The values of these recompenses in the first class are different from those in the second, and are:—1st medal equals three *valeurs*, 2nd medal equals two *valeurs*, 1st mention equals one *valeur*, and 2nd mention equals a half *valeur*.

Besides these are the *valeurs* accorded to those who take part in the great competition for the *Grand Prix* described in Mr. White's paper, viz., being among the ten selected, two *valeurs* or marks, and in addition the following:—

First-Second *Grand Prix*, four *valeurs* or marks; second-second *Grand Prix*, three *valeurs* or marks; mention, two *valeurs* or marks.

After these preliminary explanations, I am able to come to the immediate purpose of my communication, viz., the examination required for the *Diplôme d'Architecte*. The first examination was held in 1862, when five candidates passed; but it was not until 1869 that the formal decree of the Government instituting it was passed. No examination was held in 1871 (the year of the war), or in 1873, 1874, and 1875,—no candidates, I suppose, having presented themselves.

Up to the present time ninety-four candidates have obtained the Diploma,—by far the greater number being in the last four years.

* Some account of it was given in the *Builder* for Feb. 9 last.

The subjects given have been as follows:—

- Programme of Subjects of Design for Candidates for the Diplôme d'Architecte, since its institution by the "Ecole Nationale et Supérieure des Beaux-Arts":*
- 1869. A Town Mansion.
 - 1871. An Academy of Music.
 - 1872. Salle des Fes Perdus, or Great Hall of a Palace of Justice (Law Courts).
 - 1876. A Residence for Three Artists: a Painter, a Sculptor, and an Architect.
 - 1877. A Laboratory of Natural History on the Sea-Coast.
 - 1878. Four small Residences for a Tourist: one in Switzerland, one in England, one in Spain, and one in Italy.
 - 1879. A Carriage and Foot-passenger Passage through a Palace.
 - 1880. A Hall for the Public Meetings of the Institut National de France.
 - 1881. A Municipal Library for a large Provincial Town of France.
 - 1882. A House for the Société Centrale des Architectes, Paris.
 - 1883. A Concert Hall for a large Provincial Town.

The examination is held once every year. No student can present himself as a candidate who has not obtained nine *valeurs*, or marks, in the first class of the school, either in architectural design, composition of ornament, or in the competition for ornament for the *Grand Prix*, and one mark in architectural history.

The subject for design consists of a building or portion of a building, worked out with plans, elevations, sections, working drawings, details full size, and specification complete, as if the building were to be carried out, with a *devis estimatif*, or schedule of quantities, of one trade. Six months are given to work it out, the original sketch being made in the school. On the submission of the designs the candidates are required to pass an oral examination before their drawings on the various details there shown, the theory and practice of their construction, the qualities and defects of the materials employed, their strength and stability; as also an oral examination on the history of architecture,—on the elements of physics and chemistry applied to construction,—on building legislation,—and on the system of accounts.

The judges consist of,—The Director of the School and the Secretary (M. Albert Lenoir) of the School; three professors of the school *ateliers*; three professors of the external *ateliers*; the professors of Construction, of the History of Architecture, of the Theory of Architecture, of Physics and Chemistry, and of Building Legislation; two members of the School Council; an *Inspecteur-général* of Historic Monuments; an *Inspecteur-général* of Ecclesiastical Buildings (*édifices diocésains*); and an *Inspecteur-général* of Public Works,—the last three nominated by the Government; eighteen members in all.

I am inclined to believe that the standard required to obtain the *Diplôme d'Architecte* is much too high, and in this idea I am supported by one or two French architects whose opinions I have asked. It means six or seven years' serious study in Paris, and the provincial architect is not able always to afford so long a period; nor does his position or remuneration as "Architecte du Département" require a call for so preliminaries.

I have occupied so much of your time in my description of the French *Diplôme d'Architecte* that I must curtail the remainder of my communication to you respecting the German schools. So many years also have passed since I examined in detail the working of the schools of Berlin, Munich, Vienna, and Stuttgart, that I may not be giving you the latest developments. The papers of the examinations held in Berlin for the degrees of *Bauführer* (building inspector) and *Baumeister* (architect) are published in our *Transactions* of 1859-60, and will show you the very high standard (much too high, I think, in mathematics) required there. I will only, therefore, explain generally the system of education in the above capitals of Germany and Austria.

In Germany, or rather in Prussia, the student comes from the university or school with a good knowledge of geometrical drawing, of drawing from the cast, and of mathematics and physics. He first enters the office of an architect for one year, where he picks up what he can, as in England. He does not pay anything, his knowledge of drawing and of descriptive geometry placing him in a position to be able to render assistance of value in return for the privilege of working there. He has then to pass a slight examination, and studies in the architectural school for two years. His attention there is turned to all the theoretical

and practical points of the profession. He copies drawings made by well-known architects,—if at Berlin, chiefly Schinkel's and Stüler's,—and divides the time between making these copies and the composition of original designs (which are, of course, more or less adaptations of what he has learned in copying). He attends lectures on Physics, Mathematics, Construction, Ventilation and Warming, Sanitary Science, and the principles and practice of estimating and writing Specifications. At the end of the second year he passes an examination, and takes the title of *Bauführer* or inspector (if he fails to pass he continues his studies). If he aims at a higher position he obtains an appointment on some Government building as an inspector or clerk (receiving a nominal salary) for three years, and then enters the school again in the first class to study for two years more, the studies being a very advanced kind: at the end of that time he passes an examination as *Baumeister* (literally "master of building"), and he then becomes a Government architect, or practises on his own account. At Munich and Stuttgart, the capitals of Bavaria and Wurtemberg, the practice still obtains, I believe, of studying one year in an architect's office before entering the Architectural or Polytechnic schools, as they are called. Two or three years are spent in the school, followed by examinations; I am not aware whether the examination is recognised by the Governments of those countries.

In Germany generally architects and engineers study together in the same school,—in France, architects, painters, and sculptors.

In Vienna architects have their special academy; there are Classic and Gothic professors, with their respective *ateliers* or studios,—in many cases the student passes from one to the other. There are complete courses of lectures, competitions in design, and examinations held at the end of each term, as in an English university or school. In 1863, or thereabouts, a new system of study was introduced which is worth notice. The senior students of the school, about twenty in number, make an excursion with their professor twice or three times in the year for a period of a fortnight or three weeks. They take up one or two important buildings and measure them, taking plans, sections, elevations, and details (very similar to the work done in some of the series of excursions organised and carried out by the late Mr. Edmund Sharpe with the members of the Association). About 5l. is allowed to each student by the Government, and his drawings become the property of the Academy. On returning to the school in Vienna, these drawings are worked out to a large scale, traced in lithographic ink, and reproduced, each student having a copy. Alternately with the making of these drawings they work out designs of their own, and naturally these designs are inspired with that feeling which they have imbibed when measuring and drawing the ancient edifices of the country.

So many years are spent in the German schools in training that comparatively few of the students make a Continental tour. In Vienna during one or two years after leaving the Academy, the Austrian student travels through North Italy, and when the Quadrilateral was in their possession special facilities were afforded for the careful delineation of the finest works of the Italian Gothic and Renaissance styles. The superiority of modern architecture in Vienna to that in Germany generally I attribute to these Continental studies.

Before quitting the subject of foreign education, it will be interesting to note that in Spain, throughout the length and breadth of the land, no one can practise as an architect who has not received the diploma of the Architectural School of Madrid. Except that the examination which follows after three or more years' studies in the school is preceded by a serious test in mathematics and physics, I am unable to give you further information.

May I venture to trespass a few minutes more to draw a parallel between English and foreign architectural training? The first great failing in England is that the student coming straight from school is not prepared to make that use of the practical training to be had in the office which is universally assumed. He has little or no knowledge of freehand or geometrical drawing, of physics, mechanics, or of any of the elements of architectural style; he flounders about, therefore, in the sometimes styleless design of the architect in whose office he may

be placed, and acquires by the longest possible process a certain knowledge of a mixture of style and no style, second-hand: his powers of reasoning in design, as a rule, are not brought into play until his articles are terminated, and then want of time and absolute lack of training at once curtail his ideas and cramp his imagination. He has picked up an idea here and there in the office, and numerous details, but he finds himself unable to grasp the composition of a building of any size. In many cases he has never had an opportunity of visiting or studying any one of the buildings the drawings of which he has been continually at work on; and, therefore, supposing he has been thinking for himself, has never seen the results of his thoughts and inquiries (this observation applies more to London than to provincial students). He has, in fact, taken from three to five years to learn imperfectly what might have been learned in one or two if his mind had been previously properly trained to receive it.

If we turn now to France, we find that foundation of knowledge laid which is wanting in England. Before the student enters any office, his hand is trained to draw freehand in the primary schools, and his mind developed with a knowledge of applied mathematics and descriptive geometry. He enters an *atelier*, and the elements of style are learned in the *Ecole des Beaux-Arts*. Architectural drawing is carried to a high standard. Original designs are worked out, interspersed with instruction in construction of various kinds, and all the sciences cognate to architecture. The student works not so much in rivalry with his fellows as in *atelier* against *atelier*. This rivalry of the studios, which I described in the discussion following Mr. White's paper, is the most important feature in French architectural education. The isolated effort of one individual in rivalry with another may,—may, must,—continually fail, because the development of style is not, and never can be, worked out entirely by one man. An original genius suggests a theory, a second carries it a little further, by numerous others it is taken up, till at last this new idea becomes an established fact. A number of men working in one *atelier* form a school in friendly rivalry against others. Each student in it exerts himself to his utmost. The senior students advise the juniors in the study of their designs. The junior students in return work for the senior students, and acquire knowledge of style by so doing. The energies of both are brought into play, and this union of feeling,—this mutual co-operation,—enables the student to acquire great knowledge of style, rapidity of execution, and a serious study of design in a short time. In this we find the secret of the success of the French school, so far as it goes. Where, then, does it fail? It fails because a studio or *atelier* is not an office where work to be executed is drawn out, or a *chantier* where it is being carried out. Those students whose means necessitate their working for their living whilst their studies are continued from time to time at the school do acquire that practical training which fits them for their vocation, and the most prosperous architects in the present day in France (and by prosperous I mean not those highest in rank, but who are the most sought after by clients), are not, as a rule, the past *Grand Prix*-men, but those who commenced their practical training at an earlier period of their existence. On the other hand, it must not be forgotten that the high standard of design which exists in France is due to those architects who, in one sense, have sacrificed themselves and their prosperity (so far as a large income is concerned) by continuing their studies till they had obtained the *Grand Prix*, and then devoting four years more to research and study in Italy and Greece. The important changes which have in late years been effected in the *Ecole des Beaux-Arts* show that the Government is fully alive to the defects in its system of education, and the practical character given to the *Diplôme d'Architecte* may bring about an important change in the architecture of French buildings.

In Berlin this want of practical training is avoided by the student being obliged to study for one year in an architect's office before entering the school, and (if he aspires to the rank of *Baumeister*) by the spending of three years as inspector or clerk on Government buildings before he passes to his second and superior training in the school. Compared, however, with French education, the German fails in art because he is linked with the

engineer instead of with the painter or sculptor, and, further, by working in one *atelier* (viz. the school) and under one set of professors, the rivalry lies between student and student, and not between *atelier* and *atelier*. Add to this that the custom (whether it continues or not I do not know) of copying eternally the designs of Schinkel, his ceilings, staircases, cornices, &c., cramps the German architectural mind, and prevents its emancipation into a freer line of thought and imagination.

Of late years in England an immense progress has been made, due chiefly to two causes:—1st. The great development of the practice of drawing and measuring ancient buildings encouraged by the rewards of the Institute, of the Architectural Association, and of the Royal Academy, and the subsequent reproduction of such drawings in the Architectural Association Sketch Book and other publications, and in the professional journals; and, 2nd, the extraordinary enterprise shown in the publication of drawings of actual modern buildings and of competition designs in the professional journals of the day. Where all of them have been doing their best to supply a demand, it would be invidious to name specially any one of them, but there can be no doubt that the immense development and freedom of architectural design during the last ten years in England, and the rapid advance in draughtsmanship, is more or less due to the placing within the means of the poorest student a series of illustrations of the latest developments of architectural style. Two other educational sources must here be noted:—1st, The meetings and classes of the Architectural Association, a society unique in its character, existing in no other country and in no other profession; and, 2ndly, the Royal Academy, which, for obvious reasons, I should have refrained from mentioning, were it not to pay tribute to the services of those members of the Academy who, in late years as visitors, have given the students the advantage of their experience and of those other qualifications which have brought them among the elect. And here I venture to take this opportunity of rendering a personal tribute to the memory of one of our greatest artists whose loss we still deplore, the late Mr. George Edmund Street. The long experience I have had of architectural training enables me to judge, perhaps better than any one else, of the extraordinary value of the services which Mr. Street rendered in the Architectural School of the Royal Academy. The rapidity and range of his grasp of such subjects of design as were being worked out by the students, the wonderful fertility and originality of his mind, and the peculiarly happy way in which he (accepting the scheme of the student's work) turned it from bad into good architecture, and in a few minutes gave him the benefit of forty years' experience, promised to lay the foundation of a school of architectural designers in this country which would have left its mark in the architecture of this last quarter of the nineteenth century. His career as a visitor in the Architectural School was, alas! too short, but the influence of his work remains with us; and among those who, in addition to his advice in the Academy, received their architectural training in his office, there are some who have already taken a foremost place in the profession, and others who are, I trust, destined to do so.

The Chairman (Mr. Arthur Cates) said he had listened with the greatest interest to the exceedingly able paper which Mr. Spiers had read. It dealt with a subject of the importance of which it was hardly possible to over-estimate. Upon the education of the young architect depended the future of the profession and the honour of this country in the development of the art. It was much to be regretted that many of those young men now coming forward should be in charge of members of the profession who received large premiums for what was too often only the run of the office. Mr. Spiers ably represented architectural education in England, but he had also considerable knowledge and experience of Continental systems. It was to be regretted, therefore, that so large a number of the leading members of the profession, who should be interested in its future, should be conspicuous by their absence from that meeting. It might be that they would have the opportunity of reading, and carefully studying the matter which Mr. Spiers had so well put before them,

but it would have been more gratifying if they had put aside even pressing engagements to attend and favour the Conference and the world at large with their opinions as to the future prospects of architectural education. Mr. Spiers had dwelt upon the system prevailing in France, with the *patron*, the *atelier*, and the confraternity of students, assisted by the course of study drawn up by the *Ecole des Beaux Arts*. A corner-stone had been given to this by the establishment of the diploma, the possession of which was a certain guarantee that the holder had passed through a course of serious study, and had a sound basis of knowledge, not only as a draughtsman, but in all the arts and sciences which were cognate and affiliated to architecture. The contrast between this and the English system was striking, and the only redeeming feature on the part of the English system appeared to be the Architectural School of the Royal Academy, of which Mr. Spiers was the honoured master. He could not speak of his own knowledge of that school, but speaking from what he had heard of the experience of his own pupils, he could cordially endorse what had been said with respect to the great influence and the devoted energy which their late President, Mr. Street, exerted in improving the efficiency of the school. Nothing would render his loss more important to the profession than the fact that at the moment when he died he was developing in the Architectural School of the Royal Academy, with the assistance of Mr. Spiers, a system of education likely to bring forward the abilities and skill of the young men in a manner which had never been attained to in England before. All honour, therefore, to Mr. Street, and they could only hope that the Royal Academy would continue to give Mr. Spiers every assistance in developing the system so well begun. He had been much struck with Mr. Burnet's drawings which were displayed on the walls. He might incidentally mention that he was exceedingly surprised to find that Mr. William H. White, the secretary of the Institute and the editor of its "Transactions," had found it necessary to append an explanation to the word "stereotomy" in the discussion on the word which was referred to by Mr. Spiers. That one instance was sufficient intimation of the views which Mr. White held as to the want of knowledge of the architectural students in this country. As regarded the French studio or *atelier* system, in the case of Mr. Burnet they had a very happy instance of the advantages to be derived from the course of study which he had undergone at the *Ecole des Beaux Arts*. Mr. Burnet was the son of their much esteemed friend, Mr. John Burnet, of Glasgow. At an early age he had had an opportunity of showing in an excellent manner the advantages he had derived. His natural ability had been developed and guided by his course of studies at the *Ecole*, and those who visited Glasgow could hardly receive a greater pleasure than by inspecting a work by him, the entrance to the Fine Arts Gallery in Sauchiehall-street. This was an excellent and admirable work, not only complete in all its parts, but showing the great advantages derived from such a course of study as Mr. Spiers had indicated. Mr. Spiers had shown that in this country the profession had no satisfactory preparation for office-work. Tracing was the ordinary work of the office, without any particular guide. The only guide which the young man had was the competition for the prizes and medals offered by the Institute and the Association, which, after all, only affected a comparatively small class. That class really did not so much need the inducement, as they would by their own natural abilities and industry make their mark whether those prizes were offered or not. The Examination established by the Institute had done, and would do, great good, and he hoped that one of the practical results of Mr. Spiers's paper, and of his efforts to improve architectural education, would be to enlarge the Examination and to give more force and power to it, inducing the Institute also as a body to take up firmer ground on that subject than it had hitherto done. He might incidentally refer to the course taken by kindred institutions, where they had prepared a complete syllabus of subjects covering the whole range of their profession. Such might be fairly adopted hereafter as a model for the future examinations of the Institute. With regard to the education of the architect,

he might refer to the book which he had mentioned on the Tuesday evening, the report of the International Congress of Architects held in Paris in 1878, in which, under the head of *Enseignement Nationale des Architectes*, would be found a very elaborate essay on professional education. He hoped the attention of the Institute would be directed to this matter, and that it would receive more encouragement from the senior members of the profession than was evidenced by their absence from that meeting.

Mr. Lawrence Harvey said he had had experience of the German system at Zurich under Professor Semper, Zurich being considered the tip-top school at the time he studied there. Professor Semper was not unknown to the profession in England, because he had taught for some time in London. The fault of the German system was that it was really a schoolboy system, the time being cut up into lessons, so that there was no "go" in one's studies. This was not only his opinion, but it was also the opinion of Professor Semper, who was, however, forced to follow the course laid down by the Swiss authorities, and could not change it. When he (the speaker) went to Paris, he found a very different state of things. Instead of being in a big boys' school, where men from twenty-five to thirty were taught like boys of twelve, he found himself a free man without being subject to any system of school discipline. When he went to Paris he belonged to the corps of the *atelier* of M. Le Bas, one of whose pupils was M. Garnier, the architect of the Grand Opera-house, and among other pupils were some who had since risen to great eminence. The great value of the *atelier* system was that every pupil felt that his success depended largely on his own industry and application to his studies, and not only his own success, but the *prestige* of the *atelier* to which he belonged. He remembered that for one competition he worked for some three weeks until eleven o'clock at night, going back at four the next morning, while the last evening he worked all through the night. It could not be expected that a pupil in a mere school would work as hard as this; but a man who had all his initiative developed in himself would do so when prompted by the ambition of succeeding. This was the great advantage of such a school. Some years ago he travelled with his friend Mr. Charles Barry in a railway carriage, and in the course of conversation Mr. Barry asked him for his experience in the *Ecole des Beaux Arts*. He told Mr. Barry that the pupils who paid the most at the *atelier* Le Bas paid 21 francs a month, and these were the pupils who were not admitted into the school. When they were admitted into the school they paid about 15 francs; when admitted into the first-class 10 francs were paid; and any one who had received a prize, such as a medal, or something of the kind, was not asked for any money by the *chef*. Mr. Barry asked what was the motive, then, for an architect keeping an *atelier*? He told Mr. Barry that, in the first place, Frenchmen were very different from Englishmen. A Frenchman believed a good deal in doing things for the sake of "la gloire," and, besides, there was another motive actuating the *chef* of a large *atelier*. His position as such was one of the best steps towards getting to the highest honours France could give in architecture, namely, that of being elected an Architectural Academician and a Member of the Institute. This was just what the architects in this country could not aspire to, because the Royal Academy here had nothing to do with the profession. In fact, architects had not even the right of having an architect in the Royal Academy. Some days ago he asked himself whether the French system was really impossible in this country,—whether something of the sort could not be accomplished here. In this country we had not got into the way of giving a motive to a man to be a good master to his pupils. At the present time there was no inducement, except to keep the pupils at work making tracings and other things, while the architect pocketed the money paid by the parents and guardians. But he thought he saw his way to some remedy. In the Institute they now gave prizes for different things, and then there was the Examination for admission as an Associate. What he suggested was that at the same time that they proclaimed the name of the pupil or candidate who had succeeded in gaining a prize or in passing the Examination, they should also proclaim the name of his master. A great part of the merit

* A view of this doorway was published in the *Builder* for April 22, 1882.

of the pupil depended on his master; therefore it was an injustice that the name of the master should not be made known. If this were done, he believed they would very soon find a change for the better, and that, as in France, after a certain number of years, some one would be found to have gained the name of being a particularly good master. Le Bas's name seemed to be known all over the world, although he had done no very great work, with, perhaps, the exception of Notre Dame de Lorette. Le Bas's name had been made, however, by his being a good master. There were many men with a particular aptitude for teaching who had not got the chance of designing a great building. From the simple fact of a man having a big building all the world talked about him, whether it were a good building or not; and there was no doubt that honours were given to those people who were successful in getting big buildings. They received gold medals and were made knights, but this was merely fallacious, because a man like Christopher Wren required no "Sir" to be put before his name. He had had a good opportunity of seeing the influence which Mr. Street had over some of his pupils. He had seen the works of two young men who were pupils at the Royal Academy, which had been corrected by Mr. Street, and evidently he had inspired life into them, as would always be the case when one artist came in contact with those aspiring to high aims in art. Supposing Mr. Street had been an unknown man, but had had pupils like these, and it was found that all the pupils who took the great prizes came from Mr. Street! Though he had been an unknown man they would, under the French system, have had an opportunity of seeing that he was doing a great public service, and they would recompense him by according to him the highest honours that could possibly be given to him. He considered, therefore, it was of the utmost importance to proclaim the name of the master as well as of the successful competitor. For his own part, having seen the systems in Paris, Germany, and London, he preferred as a basis of education the London system, and he could say this without prejudice, as he had not been brought up in the metropolis. He had no prejudice in favour of any system of education, and he only gave the results of what he had seen. A man who was really an artist might be left to his own initiative, to learn in a better way than a boy cramped at his desk. It was not possible to fill a lot of pupils with knowledge just as pitchers could be filled with water: to say to them,—"Sit here and we will fill you with all the learning you want!" That would be simply making a lot of mediocrities. He did not think the *diplôme* which M. Guillaume had started in Paris would succeed. Its effect already had simply been to well-nigh kill the *atelier* system. The *atelier* system was simply the development of what they had in London. It was merely an extension of the London system, one master having fifty or sixty pupils, and taking an office next door to his own to accommodate them. But the pupils of the different men felt proud of being the pupils of their masters, just as a similar feeling imbued the minds of the old pupils of Barry, Street, or Scott. But M. Guillaume, in tempting the pupils to enter the School of Arts without paying anything, put them all into one box, and the result was that there could be no more feeling of competition or *esprit de corps*.

Professor Kerr remarked that he had intended to say very much what had been said by Mr. Harvey at the commencement of his speech. It was a remarkable thing, when they contemplated the immensely delicate organisation which was devoted to the study of architecture in France and Germany, that our English students under the English system seemed, nevertheless, to find their way with great success to distinction. We had no school except the school of the Royal Academy; for South Kensington, so far as the teaching of architecture was concerned, was simply a farce.* Those who understood the matter knew that its pretension in this direction was a disgrace to the Government, and that the public money expended upon South Kensington was shameful waste. [This statement was received with applause.] It was no doubt capable, under a better system, and by dismissing the soldiers and admitting the architects, of being made a centre of archi-

tectural instruction which would be of great benefit to the public, and tend to the reputation of the country. The way in which the student of high class obtained his knowledge of design in this country was now very simple. We could not persuade young men in this commercial country to devote so many years of their time as seemed to be devoted in France and Germany to the study of what he called Academic drawing. We took a different line. The student must begin business, and get business. However sublimated his ideas might be with respect to art, he (the speaker) had no objection to the student's ideas being of a business character. We could find occupation for all aspirations of that kind in this country with great benefit. He did not think that the system of paying large premiums was so much encouraged now as it used to be, and for his own part he should be very glad, if he lived long enough, to see it entirely abolished. He remembered one architect who had a very considerable practice in his day, and was of high reputation,—the late Mr. John Shaw, of Christ's Hospital. Mr. Shaw made it a rule never to take a penny from any pupil, but to admit into his office without any fee, and even on small salary if it were earned, any young man for whom he had a vacancy, and who displayed sufficient ability. That system was gaining ground in the case of many architects who did not take premiums. Those who were the most solicitous about premiums were the men who had the least to offer in return for them. The system of taking youths for three years, for whatever the master could get, was not to be commended. When a young man of artistic proclivities found himself in the office of an architect in the country, with a fair general practice, what did he do? He devoted himself, supposing he were a steady youth, and anxious to learn, to his master's work. Then again, he had now a peculiarly English institution for his education, and that was the illustrations in the professional journals, to which it was impossible to attach too great importance. From those drawings, which were fac-similes very often, young men were able to obtain information, instruction, advice, direction,—call it by whatever they pleased,—to a much greater extent than they could get in any School of Design according to the French and German systems. Therefore, he thought, the professional journals had the title of being the architectural academy of the country. The profession, therefore, ought to be by no means stingy in its support of that particular institution, and in its acknowledgment to those who, by their commercial enterprise, were being of great service to the education of the profession. In Mr. Spiers's very admirable classes at the Royal Academy, a young man had to go through a regular course, which was of great value. He would like to see a similar school established in connexion with the Institute, and also one forced upon South Kensington. We paid for it, and we ought to have it. It would be well to see a rivalry spring up between the Institute, the Academy, and South Kensington, which would very soon produce a good effect. The English architectural student educated himself in a way which must be called "rough and ready," and he failed in attaining that peculiar delicacy of delineation for want of this particular academical training. Therefore he hoped that amongst the other indications of progress which the Institute was presently about to afford, there might be some suggestions made as to the foundation of a school of academical architecture. If they looked, as they had to do once a year, at the drawings and designs sent in to compete for the Institute prizes, it was useless to say they were not first-class productions. They were not of the same style as the designs, exhibiting draughtsmanship of a high order, exacted by the French; but from their point of view nothing could be better than some of the drawings which were hung in that room. Therefore he for one was very much inclined to think that if they were allowed in England for the next twenty or thirty years to pursue their own course, without too much influence from abroad, they would find England at the head of all the schools of architectural design in the world. No one could look back to the last fifty years of English history in architecture without being satisfied that we were pursuing a course that would end in our ascendancy in this as in many other things.

Mr. E. Knill Freeman (Bolton-le-Moors) remarked that from what Mr. Spiers had said it

seemed that the outcome of the French system was to develop the more artistic part of professional education, while the German system produced a more cast-iron development of it. Any one who had studied the professional education of the last thirty years would see that one great danger was the separation of the theory from the practice of architecture. A short time since remarks were made in the building papers as to the great difficulty which assistants experienced in meeting with adequately-paid appointments. He did not dispute that there were great hardships and difficulties, but his own impression was that in England a good man in the long run would always make his position and command his price. With regard to the question of education in this country, it had to be looked at from two points of view; they had to consider the education of the profession generally, and anything done with that in view, of course, must have its centre and principal movement in London. But in seeking to be generally advantageous they must have such appliances for the use of the students of the profession as would bring them within the reach of all. One of the great difficulties in England in any attempt to adopt the Continental system would be in the long term of residence which seemed to be required to perfect the system. In England, when a young man went into an office as a pupil, he had more than one thing to consider. In the first place, he had to consider his education; and in the next place he had to consider a certain position he might have in the district, and which he wished to keep up. The fact of being away for some years would very much shake and weaken that connexion, and he fancied that although a good education would be of great advantage, the dropping out of the minds of those amongst whom he hoped to practise would be a very great drawback. The chief movement in this matter must come from the societies, and first from the Institute. If this were so, and some arrangements made for art-education in the principal centres of the profession, by which provincial students might obtain very different privileges to those which they now possess, a great step would be made towards the object in view.

Mr. William H. White (Secretary to the Institute) corroborated what Mr. Harvey had said to the effect that when a candidate in France gained a prize, the master's name was also announced. For instance, when he lived some years ago in Paris he used to send drawings to the *Salon*, and having omitted to put the name of his master upon one, he was compelled to add the name of his London master. He held in his hand a copy of the *Gazette des Architectes*, which contained a return of the names of the gentlemen who received the *Diplôme* in 1883, attached to each name being that of the master. From this it appeared that the master who was now the most successful with his pupils was M. André.

Mr. E. A. Grüning considered that after the careful way in which the subject had been treated in the paper, and by the speakers in the discussion, there was little to be added. He was much interested in the subject of foreign education. He had commenced his education at a very early period in Hamburg, under two well-known architects there. He was obliged to return to his country, but as a result he got a practical bit of education afterwards, viz., six months' work with his hands in the workshop. He had never ceased to feel that it was an immense advantage to be able to use his hands, and to understand how others carried out with their hands what he had designed with his head. It was a pity that more of the senior members of the profession were not present to profit by the valuable advice which had been given as to the teaching of their pupils. Professor Kerr had rather amused him by mentioning the existence of a "School of Architecture" at South Kensington. He had had many applications for assistants' berths from young men who had studied there, but not one of them seemed to know even the size of the common brick in use in London. That was an absolute fact which had occurred to him more than once. The other schools in London could not be too highly valued. A pupil had the opportunity of learning general and good practical work in the office where it was carried on, but in no case could he obtain the education to be had at such schools as that of the Royal Academy. The want of this in his (the speaker's) time was bitterly felt, but this was now well supplied under the leadership of Mr. Spiers. The value of the work done by the Architectural Association was

* We have frequently called attention to the wretched character of the architectural work, in reviewing the students' prize designs at the annual exhibitions.—Ed.

almost equally great. He saw that every day in the case of the pupils in his office, whom he tried to bring up to practical work, but whom without the assistance of these schools he would fail entirely to educate, in the proper sense of the word.

Mr. E. G. Bruton (Oxford) remarked that in his early days, Mr. Spiers, before he went to France, had the run of his (Mr. Bruton's) office. He had been much gratified with the remarks of Prof. Kerr and the other speakers. As a provincial architect, he wished some means could be adopted of allowing pupils the opportunity of passing through some such schools as had been advocated.

Mr. Woodward thought that constant visits to buildings in progress were of the utmost importance to the young architect.

Mr. Blagrove considered that, as a general rule, a pupil in the office got on rather in spite of his master than through any assistance he got from that gentleman. If the pupil, then, were asked to mention the name of his master he would too often give the name of a man who only afforded him the chance of snatching a few hours in the evening to devote to the study of design. Perhaps so many of the senior members of the profession had shown good taste in being absent from that meeting.

Mr. John Slater remarked that the whole feeling in this country was against centralisation, and against depending too much upon authority. We were so anxious and desirous of fostering and giving scope to individual genius that we very much preferred that it should run into individual eccentricity rather than be "licked into shape." Could they have had a more typical English speech than that of the learned Professor? In this country the student, unless he had some one to look after him carefully at first, did not know where to go for information. He agreed with what the Professor had said as to the excellence of the designs which were sent to the Institute, and those which appeared in the building journals. Good men, no doubt, who had a natural ability and genius, got on, in spite of everything, but they took a great deal longer to attain the knowledge required in their practice than if they had been able to make use of such means as were to be had abroad. At a previous meeting of the Conference reference was made by Mr. Cates to several French books as being the best on their respective subjects, and this showed that some incentive should be given to architectural students in this country to make themselves acquainted with other languages than their own. To a very large number of young architects those were simply sealed books. Last year the Board of Examiners made a recommendation that in the Examination there should be some questions showing the knowledge of foreign tongues possessed by the candidate. The Council, however, did not see their way to comply with the request, but he ventured to hope that the Council would yet consider whether the scope of the Examination should not be more extended. He thought that while the examination in France was rather too difficult, we at present erred on the other side.

Mr. Hugh MacLachlan said that the German system had hardly had sufficient justice done to it. The French system was pretty fairly known, but the German system came in somewhat between the French and English systems. It was, like the English system, more practical, but it did not lead to so much of that beauty of drawing produced by the French system. He questioned, however, whether the latter system led to such variety of design as was to be seen in Germany and England. The question as to which system of education was best might be tested by two points,—that which produced the best men, and that which produced the largest number of well-educated men. He was rather in favour of the latter. By the English system young men were able to learn pretty nearly everything if they applied themselves diligently. There was no doubt that many of the buildings carried out in England at the present day were a disgrace to the nation; on the other hand, there were buildings in this country which were finer perhaps than anything to be found elsewhere. Referring to the German system, he remarked that Herr Baurath Ende, in taking his pupils over different buildings, was in the habit of drawing their attention to the construction and safety of the scaffolding and ladders.

Mr. C. Aldridge, as a provincial architect, would like to say something about pupils in the

provinces. He would also like to add his meed of praise to Mr. Spiers for the able paper he had read. The difficulty was to see how best to commence the necessary reforms, and how they could be effected under the present system of pupilage. For his own part he would like to see that system altogether abolished; but something must take its place, and at present there did not seem to be any indication of what that something should be. At present parents had a notion that when their son left the office in which he had been articled, he would be at once able to place his brass-plate on his door, and make a fair income from his own practice. That idea not only affected the parents, but also the pupils themselves, for they were more or less permeated with the notion that when leaving the office of the architect to whom they were articled, they would be able to start for themselves. It was next to impossible to get them to attend classes or lectures after office hours, which they would do if they knew they had to pass a compulsory examination at the end of their term of pupilage. In Liverpool he had established classes in connexion with the Liverpool Architectural Society, somewhat on the same principle as those in connexion with the Architectural Association in London. These were more or less successful, and he then endeavoured to establish a place where lectures should be given on practical subjects. Two or three of these lectures were delivered to almost empty benches, and he could hardly blame the young men in this matter; they worked there in the office all day, thinking there was nothing more to be done to acquire efficiency. The architectural works of foreign countries were far superior to anything in this country, and there was a thoroughness in them not to be found here. In England much was lost by this want of system, and until there was a compulsory examination for architects, they might talk with little practical effect.

Herr Franz Baltzer (Government Baumeister, Berlin), remarked that in Germany the examinations for architects were too exacting, especially in regard to the auxiliary sciences. He believed that in course of time the German system of education would approach more and more to those of England and France.

The Chairman felt that the whole question had been so fully considered that any observations he might offer would be mere surplusage.

A hearty vote of thanks was then passed to Mr. Spiers for his able paper.

Mr. Phené Spiers, in replying on the vote, said he thanked those present for the kind way in which they had shown their appreciation of what he had done. His best reward had been in the information he had elicited, and upon which he wished to make a few remarks. His object was to bring the whole subject of professional education before them, especially as their Examinations had only been lately founded, and this was the first Conference held since their establishment. He hoped the proceedings of that Conference would have some influence on the extension of the examinations, to make them wider of application. He did not wish them to go to the same extent as foreign schools, although no doubt they ought to develop a higher standard. In running through the remarks they would see at once how that portion of his paper referring to the rivalry between studio and studio had been taken up by his friend Mr. Harvey, who spoke of the "Atelier Le-Bas" as producing the best architects. For himself, of course, as a pupil of M. Questel, he spoke of the "Atelier Questel" as being the best. When he first went to Paris to study as an architect, his father said, "Let us see first at the school whence the largest number of medalists have come," and consequently, he went to M. Questel's atelier. Prior to that he was aware that M. Le-Bas was the best, but the sun of both of them having set, M. André was to the fore, and in consequence of the numerous mentions of students of his who had obtained diplomas at the examination, he had been elected as Member of the Institute. This illustrated the great value of the rival ateliers, which we could never hope to have here, except in a sort of indirect way. He hoped the pupils of Street and Burges in by-gone times, and of such living men as Waterhouse in the present, would take a certain pride in their schools. He knew that the pupils of Street had the greatest affection for their master, and often spoke of the advantages they had gained in his office. With regard to the new

departure which had been taken in France though they had established ateliers in the schools, there were some outside, so that freedom was not so much lost as Mr. Harvey thought. Professor Kerr was willing to be content with our own system; but for himself, he (Mr. Spiers) was not quite inclined to acquiesce in the continuance of things as they are, for he thought we had much to learn from France and Germany. He felt certain that the most eminent men of the "Queen Anne" school were the greatest admirers of the four great architects of France,—J. L. Duc, Duban, Vandoyer, and Labrousse. He thought that if there was any decided tendency in Classic design at present it was towards a close assimilation of modern French work. Professor Kerr had referred to the architectural school at South Kensington. The reason of its failure and the failure of other similar schools there was, that they were not established to train artists of either profession, but masters of schools, and it would take many years before they arrived at any other results under the existing system. It was only necessary to go through a course which enabled them to obtain appointments as masters to teach others, and the training in the architectural school was just sufficient to enable a man to teach the elements of construction and what was known as architectural design to others outside,—just sufficient to teach a working man when he went into the provinces. They were always obliged to get their ultimate training elsewhere. Mr. Freeman seemed content with English draughtsmanship, and thought we had a very high standard, but he did not agree with the theoretical instruction abroad. He failed, as perhaps he (the speaker) had done, in making it clear that though it was theory which was taught in the French schools, the theory which was taught was the theory of construction in its most extended branches. A French student had to go through a training in descriptive geometry and stereotomy which was quite unknown to English architects. Any one who went through that could not help reaping an advantage from it. He did not wish to suggest that such a man would have any exceptional powers. But he might remark, as an instance, that though unacquainted with practical work, when he returned to England he was working on a large building under Sir Digby Wyatt, and some of the ceilings of staircases were of complicated construction in different forms of Roman type. Though, of course, they came in very easy to him as part of the study he had gone through in France, yet he was astounded to find that the measuring surveyor had to come to him to know how they were constructed, and could not get out their quantities without his (Mr. Spiers's) assistance in this particular work. We had in England a most excellent school of draughtsmen, who had arisen within the last few years, but notwithstanding their draughtsmanship they were in different designers of plans. In France they laid great stress on the study of plans, but when this study was attempted at the Royal Academy Mr. Street found out that it was difficult to teach the pupils to draw large plans, and so he set them to draw elevations. That was one of the difficulties they found in architectural students from want of previous training. Referring to the absence from provincial towns of the means of proper training, his experience led him to expect better training in students from the provinces, and especially in those from Scotland, than in those from London. In the country the pupils had the advantage of seeing the buildings carried out which they had been working upon. They had to take up a larger area of more varied work, and they had more varied practice than Londoners, who were frequently engaged in the carrying out of one or two large buildings. Provincial men must, therefore, not despair, as their pupils were better trained than London pupils. Mr. Grüning had referred to the value of workshop training, and he should bring that out later on. Mr. Bruton, of Oxford, complained that there were no schools of architecture in that city; but there were foundations, such as the Taylor Museum, which might well be applied for instruction in the art. Strange as the assertion might seem, Oxford was about the slowest place for education that ever existed. With regard to the remarks of Mr. MacLachlan, if that gentleman had studied in Paris he would

have seen the same variety and change in architecture as he saw in Germany, and as great differences between the French buildings as a shepherd saw in his sheep. He was glad to hear that in Germany they were turning their attention to measuring buildings. Mr. Aldridge had spoken of the difficulties of pupils in the provinces, and there could be no more eloquent description of what was required. He was sure Mr. Cates must have listened with great interest to this discussion, because it pointed with great force to the want of examinations. A man should go through the fullest education in order to prepare himself for examination. The lawyer knew he must pass an examination, and if the architect knew that he would have to do so he would read up works on various subjects, and in every possible way prepare himself to pass the ordeal successfully. The student would take an interest in preparing himself for examination, seeing the ultimate result to be attained. No one had referred to one portion of his paper, the importance of some training before a young man entered an office. What kind of training was there for them in London? He was inclined to recommend King's College and University College, and he could not see why parents should not insist on their sons spending some time in obtaining that class of instruction which was obtained in the German Gymnasiums. There were some public and private schools which were moving in that direction, and, as time went on, the necessity of teaching technical science in finishing schools would become more apparent. At present, at King's College and University College, they could derive instruction in all those branches which were taught at the Polytechnic schools in Germany and the École des Beaux Arts in Paris. In Manchester, they had Owen's College, and in Leeds and other large towns there were technical schools where those who intended to become architects could get their early training. It would be of the greatest value to any student if he could go through a course of training in the practical work of the workshop. All this would fit him for understanding and appreciating the work of the office. The great trouble we had to contend with under existing circumstances was that the student worked three or four years without understanding what he was doing, and found he might have learned in half the time if he had gone through the necessary preliminary training before he entered an architect's office. He not only took five years to do what might have been done in three, but he failed to get as much out of his master as he might have done. His advice to pupils in an office was that the sooner they began to design the sooner they would begin to work. It was of great importance that the pupil should know first of all what he had got to do in order to train himself for a definite result. He should exercise his powers of design and get the best training he could, and that would ultimately result in presenting a training which would be superior to that of any foreign school.

On Friday afternoon there was a visit to the workshops of Messrs. Cubitt & Co., Gray's Inn-road. A notice of this will be found on another page.

On Friday evening the sixth and concluding meeting of the Conference was held.

Mr. Cole A. Adams, President of the Architectural Association, occupied the chair, and in opening the proceedings, said that, following the precedent which had been usual in the Conferences which had been held in that room for many years past, it was decided this year on the Friday to hold a meeting which perhaps would be in a way specially dedicated,—if he might say so,—to the Architectural Association; and to that fact he owed the honour of being in the chair that evening. He was sure he was only expressing the wish of every member of the Architectural Association that the more a feeling of cordiality between the members of the senior and junior societies was cultivated the better it would be for both. The position they held to their *Alma Mater* was such as to leave no room for feelings of jealousy or rivalry. They passed through the ranks in the junior society for the purposes of education, and having passed through the classes of the Association, he trusted all the members would pass into the senior society, and thus keep up the connexion

between the two institutions for many years,—far beyond the thirty years which Professor Kerr would treat of in his paper. Before calling upon Professor Kerr, he might say that Mr. White (the secretary) wished to make a communication to them.

Mr. Wm. H. White said the Honorary Secretary of the Société Centrale des Architectes had written to express his regret at not being able to attend the Conference to represent that Society, and Mr. A. N. Bailly (Membre de l'Institut de France, Inspecteur-Général Honoraire des Travaux d'Architecture de Paris, &c.), one of the oldest and most respected architects in Paris, had written to say he was obliged to remain in Paris. He had also received letters from M. Garnier (the architect of the new Opera-House in Paris), Professor von Hansen, of Vienna, in reference to the ownership of drawings; M. von Hasenauer, of Vienna; and others.

Mr. J. Macvicar Anderson, Hon. Sec. of the Institute, observed that he wished to express his gratification that they should, at the concluding meeting of the Conference, have their friend the President of the Architectural Association in the chair. It appeared to him though a fortuitous yet a happy circumstance, and he quite agreed with the remark of Mr. Cole Adams that the longer and closer the connexion between the senior and junior Societies existed the better it would be for both. He also wished to express the gratification and pleasure it had afforded the Institute to receive there, in their rooms and in a social manner at their tables, so many friends from the country. It had afforded them sincere satisfaction to see those gentlemen in London, and he was sure he was expressing the feeling of all metropolitan architects when he said that the more they could promote good feeling and harmony between themselves and their brethren in the country, the better it would be for the future of architecture throughout the kingdom.

The Chairman then called upon Professor Kerr to read his paper, which was as follows:—

ENGLISH ARCHITECTURE THIRTY YEARS HENCE.

THE question I am requested to submit to the consideration of this meeting is one that has a certain particular and practical importance just now.—What is the line upon which the profession of architects is moving in England? In other words, what is likely to be the position of English architects, say, thirty years hence? I am expected to confine your attention to the artistic aspect of the question, but of course to regard it in a practical light.

Now we pretty well understand in these scientific days that all continuous enterprises of human industry or skill, or of social or intellectual activity, when looked at in any degree under the surface of affairs, are found to be subject to the government of certain laws of progression; so that it is the critical study of the past that becomes the only means of forecasting the future. In the arts more particularly is the fact forced upon the notice of thoughtful observers that there has been a continuous current of development gliding through all the ages in one grand inevitable course: now in the sunshine, now in the shade; here swift and strong, there feeble and sluggish; but always the same; the same springs, the same issue; great men and great successes,—and great failures with them,—being but the greater bubbles on the surface of events, and even the humblest of workers adding every one his indispensable contribution to the tide.

Amongst the arts of which I venture to speak in this high tone, I may at once say that I regard architecture as one of the very greatest,—perhaps, indeed, beyond dispute, the most subtle and most glorious of all. It is nothing to me, standing before an assembly like this, if I should be told to moderate my language, and to ask you to veil your faces before the painter or the poet. I do nothing of the kind. I ask you, rather, to look back along an expanse of magnificent building, whose length is not to be measured by furlongs or feet, or its area by acres, but its unbroken continuity by the very ages of history, throughout at least 5,000 years of time, and in whose earliest and crudest works, such is the inherent majesty of the art, Queen of the Arts, the noblest of mankind aimed at never less than the noblest homage to the noblest conceptions of the Divine.

Along this splendid line of artistic manifestation we see exemplified, more clearly than in almost anything else that philosophy can quote, the operation of the process now known by the name of evolution. The simplicity of it is, indeed, perfect. Given the desire to build in beauty,—nothing more,—and the whole scheme of architectural history throughout the past is understood; and the persistent sequence of the self-same scheme throughout the future too. Out of the desire there comes at once a continual endeavour after novelty, the diversity which supplies the material for selection. That which is worthy is reproduced; that which is not is not; and hence arise schools and styles, in the most direct and palpable form, by the survival of the fittest. Thus it is that the study, the very studentship, of this art becomes so essentially bound up in the past; for no training worthy of the name can stop short of a review of the whole historical scheme of development. And thus it is again that the progress of change in this art appears to be so slow, the limits of even the most eager originality so narrow, and the disappointment of the too ambitious so complete.

Therefore, if we would try to understand our own position just now as representatives for the moment of this great art in England, and to foresee the attitude of our order in the next generation, the easiest mode of procedure,—perhaps the only one,—is to begin a generation back, and so work forward to the present day, in the hope that our research may acquire momentum enough to carry us still forward a little way into the future.

About fifty years ago, then, there happened certain occurrences which make the period a great landmark in English architectural history. In 1834 there was founded our professional guild, now so well known as the Institute of British Architects. In 1834 also the old Houses of Parliament at Westminster were burned down. The foundation of the Institute, and its incorporation by royal charter shortly after, indicated the arrival of the profession of architects in England at a significant stage of development and of organisation. The destruction of the important edifice which had accommodated the business of the Legislature afforded an opportunity to that profession to enter upon a new career. The accession of the young Queen Victoria in 1837, involving the inauguration of a new national spirit, may be regarded as one more, and perhaps the chief, in this group of events; and if we further include the advent, within a short time afterwards, of Her Majesty's most admirable Consort, as an ally to the great cause of culture,—and more especially, as regards our present purpose, with reference to the splendid new Palace of Parliament, by that time waiting for just such help as this,—we see, clustered within the compass of half a dozen years, a concurrence of circumstances by which there is constituted with remarkable precision just such a point of departure as we desire.

Let me remind you of the somewhat analogous combination of events under which English architecture started on a new line of development in the latter half of the seventeenth century,—the overthrow of the gloomy Puritan ascendancy, the establishment of a new and brilliant royalty, then the disaster of a great fire—we will call it the burning of the Cathedral of London—and the rise of a great architect. So also at the time now before us we have, in the death of William IV. and the accession of the youthful Victoria, the old worn-out Georgian Philistinism going down at last, rude and dogged as ever, and another social system arising, entirely new and bright, the hope of the world; and therewith another great fire, and the rise of another great architect. I am accustomed to speak of Wren and Barry as the two great architects of modern England, in whose especial eminence there is as yet no third great architect quite entitled to claim a share. With both of them alike, everything their hand touched seemed to turn to a certain personal graciousness of form not easily described or accounted for; neither of them, perhaps, attaining to the ideal which we are beginning to conceive of the perfect master of our wonderful art, with whom mechanical science and æsthetic grace advance hand in hand from the sketch to the consummation; such of them, indeed, in his degree very notably a designer of superlatification, if the truth must be told, but both accomplishing that superlatification with an infinite success of elegance altogether his own artistic quality.

INTERNATIONAL HEALTH EXHIBITION

Supplements to The Builder.

No. 1. MAY 17, 1884.



On another page we have given our general impressions of the International Health Exhibition, its scope and probable results; and we here commence our detailed notices of its contents.

We noticed at some length last week (p. 636, ante) the exhibit which is being made by the London water companies; and a fortnight ago (p. 601) we gave some particulars of the street of old houses, two sketches of which we publish this week.

HOUSE DRAINS: THEIR CONSTRUCTION AND VENTILATION.

CLASS XXII. of Group 3, The Dwelling House, is occupied by materials and appliances for house drains, their construction and ventilation, including sewer disconnection, sinks, traps, gullies, and the disposal of house refuse. The exhibits under this head are to be found for the most part in the South Annex, parallel with and to the north of the western end of the great South Gallery, although some exhibits properly belonging to this class will be found among the sanitary fittings in Class XXIII, for which the Eastern Annex is set apart, and which we propose to notice next week, together with any stray exhibits belonging to Class XXII, which are not here noticed. In Class XXII, as in many other classes, many exhibitors have not yet occupied the space assigned to them, or have not arranged their goods. However, we proceed to notice, as far as may be, the exhibits in the South Annex.

Mr. John Waldram, C.E. (Stand 465), exhibits a curiosity in the shape of what is described as "a length of oaken drain-pipe," said to be more than one hundred years old, and which was found on the site of Hatchett's Hotel, Piccadilly. The bore of this is 3 in. or 3½ in., and approaches an oval in section. It is described as a "drain"-pipe, but we presume that it could never have been used except for the conveyance of water.

At the next stand, 466, Dr. R. W. Leftwich, of Kennington-road, exhibits the model of a portable ventilating shaft for temporarily fixing over street sewer manholes or side entrances when necessary. The portable shaft is provided with a chamber to contain disinfecting fluid, which can be discharged into the permanent shaft or manhole as may be required.

At Stand 467, Mr. Samuel C. Dean, of Fulham, shows one or two appliances which merit the attention of visitors. One of these is called the "Parcean" ventilator and sewer-air cremator. Shortly stated, it consists of a chamber filled with asbestos kept in an incandescent state by a gas-flame, which draws the foul air to it and purifies it. This appliance can be used in connexion with the extraction shafts of hospitals for infectious diseases, as well as for the ventilation of sewers; in the latter case, a gauze division is inserted to prevent the back-draught of fumes, so as to obviate possible danger in the event of an escape of illuminating gas from the street mains getting into the sewer. Another exhibit shown by Mr. Dean is the "Factolene" abrading filter, which the inventor puts forward as a means of cleansing and oxygenating the effluent waters from sewage works,—the filtering material used—charcoal—being capable of re-vivification without removal, simply by allowing all the water in the tank to flow away, and then pumping streams of air through the filtering medium from the perforated pipes which are imbedded in it.

Mr. Henry Masters, architect, of Bristol, is mentioned in the catalogue as exhibiting, at

Stand No. 468, a drawing showing the application of the double-check system of house drainage, together with various fittings used in the application of that system; but up to Wednesday afternoon they were not in place.

At Stand 469, Messrs. Henry Bailey & Co., of Fulham, have a good display of sanitary pottery and stoneware, including the "Desideratum" stable, gully, and grease-trap, which is well worthy of attention, being compact and simple in arrangement, easily get-at-able, affording ready means for intercepting matters that should not be allowed to pass into the drain, and facilitating the ventilation and disconnection of the drains. Banner's patent drain-trap is shown at this stand, together with Roberts's patent water-tight joints for drains, which are no doubt capable of producing very good results. The joint is constructed on the principle of the wedge. The collar, which is lined with an amalgam, is passed over the abutting ends of the two pipes required to be connected, these ends being also loaded with amalgam, and having their surface moulded in a reverse direction to that of the interior of the collar. The pipes are, of course, made of uniform diameter inside and out from end to end, the sockets being omitted.

Mr. Charles Hawksley, C.E., of Great George-street, exhibits, at Stand 470, some drain-pipes of stoneware and cast-iron joined together to represent a house-drain, and terminating in a vertical length of lead soil-pipe. To this system of pipes it is intended to attach a plumber's force-pump and two 6 in. gas-pressure gauges, so as to exhibit a method of testing the soundness of house-drains whilst in their usual working condition. The test is to be applied in this way: Air is to be introduced at a slight pressure (the catalogue says a pressure equal to a vertical column of water about 2 in. in height); if the air escapes we presume that the test will be taken to indicate that the drains or soil-pipes (or both) are inefficiently jointed, connected, or trapped. The arrangement was not in working order at the time of our visit.

At Stand 471, Messrs. R. Houghton & Co., of Chelsea, show their improved gullies for bath and sink-wastes and surface drains. Of these gullies we have spoken favourably on a previous occasion. Some specimens of bad plumbing,—bad, some of it, both as to the workmanship and as to the principles involved,—are shown at this stand. The section of a lead D-trap which has been in use shows at a glance how justly these traps have been condemned as being "traps of deposit."

Messrs. J. J. Ellis & Co., of the Ellistown Collieries and Fire-clay Works, near Leicester, have on view at their stand (472) some sanitary stoneware of exceedingly good quality as to material, all the pieces that we examined being characterised by truth of shape.

Major Noott, of Rookwood, Parkhurst, Isle of Wight, shows on Stand No. 473 lengths of his patent drain-pipes, which, instead of having the socket at one end and the spigot at the other, are provided with a half-socket at each end, the one end having the half-socket on the lower half of the pipe, and the other end having the half-socket on the upper half of the pipe. By this means it is claimed that it is possible for a workman laying a drain to make joints which shall approach much nearer to perfection than those made when the ordinary pipes are used.

At Stand 474 Messrs. John Watts & Co., of Bristol, show their patent "asphyxiator," as used for applying the smoke-test for proving the soundness of house drains. Sulphur or smoke-paper being placed in the combustion chamber and ignited, the rotation of the fan forces the fumes through the drains. All outlets and ventilating pipes being closed during

the test, the fumes will find their way through defective joints and imperfectly-sealed traps, and so reveal the point or points at which sewer-gas passes from the drain into the house.

Mr. W. Batten, C.E. (Stand 475), of Loxell's-road, Birmingham, shows his patent ventilating manhole covers for sewers, with dirt-boxes, &c. Also, a sewer ventilator with flushing-box, dirt-box, and lamphole-cover combined. These covers have been noticed by us on previous occasions, and they have been largely used in several important towns.

At Stand 476, Messrs. James Stiff and Sons, of the London Pottery, Lambeth, have a fairly representative collection of useful appliances in sanitary stoneware. Besides drain-pipes, bonds, and junctions, they exhibit some good traps, including the "Interceptor" sewer-gas-excluding trap, Weatherley's "Disconnector" waste-water trap, Dr. Soper's drain disinfectant,—very useful for hospitals and institutions, and even for private houses. Most of these appliances have been described by us on previous occasions, but possibly some visitors to the Exhibition will see them for the first time. A rain-water pipe inspection trap, housemaids' and hospital sinks, and other items for kindred purposes, will be found on this stand.

The Patent Victoria Stone Company (Stand 477) make a good show of their speciality in the form of sinks, paving, &c. Many of the specimens are shown worked in section, so as to exhibit the nature of the material.

Stand 478 is occupied by Messrs. Frederick Bird & Co., of Great Castle-street, Regent-street, with a collection of sanitary ironwork, mainly for use in connection with sewers. Their exhibits include charcoal ventilators, flushing-valves, tide-laps, penstocks, &c.

The Birmingham Sanitary Association show, at Stand 479, Potts's Patent "Edinburgh" air-chambered sewer-trap, which has now been in use for some years. It affords means for the total disconnection of house-drains from the main sewer, and for the admission of fresh air to the former.

Mr. John Hewes, of Leicester, exhibits at Stand 480 his proposed patent apparatus for the utilisation of sewage and other house refuse by converting it into gas. The gas so produced is not intended for use for illuminating purposes, but its calorific value is said to be such as to make it a valuable fuel. The apparatus was not shown at work at the time of our visit, but from what we were told it seems to give promise of much usefulness. In starting the apparatus it is necessary to use coal and other fuel for the fire, but when once started some of the gas which it makes is used to keep it going.

Stand 481 is occupied by Mr. T. Harnett Harrison, C.E., of Liverpool, who shows a basket sewage-strainer and a new patent collar joint, which seems to give promise of affording a really reliable means of connexion between lead or iron pipes and earthenware fittings. The difficulty of making permanent and reliable connexions between these differing materials has long been experienced, and plumbers and builders will be interested in inspecting this method of joint-making.

Mr. Henry Dean, of Wolsanton, Stoke-on-Trent, shows, at Stand 482, some of his patent traps, which are very good and simple, affording means for instantaneously clearing out any deposit that may accumulate.

Stand 483 is, according to the Catalogue, occupied by Mr. Joseph Parrott, of Wallington, with "a self-acting valve applicable to any form of water-closet apparatus, sink, or bath-pipe, for preventing the admission of sewer-gas." At the time of our visit this was not to be seen.

Between Stands 483 and 484, but not mentioned in the catalogue, Mr. J. W. Cockrill,

Borough Surveyor of Great Yarmouth, exhibits a model of a portable flushing tank used for flushing sewers; also some pipe-sewer junction-blocks, likely to afford great convenience in forming connections between pipe-sewers. As Mr. Cockrill points out, much difficulty is experienced in making proper connections with pipe-sewers. If the pipes are removed to insert junctions, the joints are disturbed, and it is nearly impossible, irrespective of cost, to make the sewer good in a proper manner; while if an ordinary pipe is cut into the sewer it is very difficult to insure a proper joint being made.

In Mr. Cockrill's experience, seven stoppages out of the ton of both sewer and lateral drains have been caused by the careless manner in which this work has been done. The use of these junction-blocks compels the lateral drain being connected at a proper angle with the sewer, and a perfectly tight joint can be made round the collar. It also prevents any projection inside the sewer. Regulations have been made by the Great Yarmouth Urban Sanitary Authority compelling the use of these junction-blocks on pipe sewers of 12 in. diameter and upwards.

At Stand 484 Mr. R. R. McKee, of Kirkcaldy, shows a patent drain-flushing apparatus, the principle of which is different from that of other flushing-tanks we have seen. In McKee's apparatus the contents of the tank are not discharged by a siphon, but by a valve automatically opened, partly by the rising of a float on the surface of the water, and partly by the admission of the water to a piston, to the rod of which the outlet valve is connected. This apparatus is shown in action, and will well repay examination.

The London Sanitary Protection Association (Adam-street, Adelphi) are mentioned in the catalogue as the occupiers of Stand 485, which, however, was vacant at the time of our visit.

Mr. John C. Bothams, M.Inst.C.E., City Engineer of Salisbury, exhibits (Stand 487) a model of his improved chimney-top, which is constructed of louvre bricks. The top is made to receive several flues, and it is claimed for it that its arrangement is such as to secure a powerful up-draught, while ensuring uniformity, or rather preventing deformity, of appearance.

Mr. Hugh S. Grogan, Surveyor to the Bromley Local Board, shows (Stand 488) a patent air-inlet head for the ventilation of house drains.

Some sectional drawings of a plan for improving the ventilation of house drains and sewers by means of the street lamp-posts and by vertical tubes running up the fronts of the houses, are shown by Mr. C. M. Elstob, of Cheapside, at Stand 489. There does not appear to be anything new in these proposals, against which serious objections have been urged.

At Stand 490, Mr. Edmund Page, of Forest Gate, shows an improved grease-interceptor and a gully trap for kitchen sinks.

Stanford's patent joint for drain-pipes is shown at Stand 491, by Mr. Henry Ough, of Austin Friars. From specimens which have been in actual use, it appears to form a reliable joint, one of its great merits being the ease with which the pipes can be properly connected.

Stand 492 is occupied by Messrs. George Waller & Co., of Holland-street, Southwark, who exhibit flushing penstocks, manhole covers, tide-flaps, and a complete set of drain and gully-cleaning tools. Their new patent side-entrance and manhole-cover is specially worth the attention of visitors practically interested in such details. This cover is so arranged that it can at pleasure be used as a ventilator, or closed, but in either case it is level or flush with the pavement, and is neither obstructive nor dangerous to wayfarers. With the side entrance cover with safety-grating at present in use, when the door is opened a grating rises to the level of the path for people to walk over, but the door stands up like the lid of an open box—a very inconvenient and even dangerous arrangement in crowded thoroughfares. In Messrs. Waller's new patent cover the door is made with slot openings so as to form a close door. When men are at work in the sewer below—or if it is required at any time, irrespective of the presence of men at work below, to be used as a ventilator,—the slotted grating, which is hinged on to the door, is unfastened and allowed to hang down. The upper door, or grating, being then shut, free ventilation is afforded, while allowing people to walk over it in safety.

The North British Plumbing Company (Stand 493), show iron soil and drain-pipes, the use of which, owing to the comparative fewness of the joints (which are made with lead), the strength of the material, and its comparative non-liability to fracture, seems to be extending. An air-chamber and cover, affording ready means of clearing the pipes, is shown by the same exhibitors.

At Stand 494, Mr. Donald Nicoll, of Buckingham-street, Strand, shows models of apparatus adapted for the interception, disposal, and utilisation of refuse in connexion with street subways. In a pamphlet entitled "Cloacina," to be had at the Stand, and also on some handbills or "tracts," Mr. Nicoll shows how much room there is for improvement in these matters. Model No. 1 is a dustbin, with wire baskets attached, the latter to contain dry household waste, for which there is a ready sale, if separated from ashes. It will be observed that this bin can be removed by a pole and slings (also exhibited), and its contents emptied into ordinary dust-carts, or the contents may be shot into a sewage-tank (Model No. 4). The dustbin can be made instantaneously air-tight, and can at once replace the unwholesome dust-bins now in use. Model No. 2 shows a garbage-bin, intended to contain household offal of a decomposing nature, such as the entrails of fish, fowl, or game, also vegetable and all other kinds of household refuse; the garbage-bin contains a deodorizing sifter, which on being rapidly moved on the sliding rods to which it is attached, distributes over each deposit of garbage a needful quantity of deodorizing substance. This bin can also be kept air-tight, and removed like Model No. 1. Model No. 3 affords an approximate representation of subways proposed to extend beneath pavements, or footpaths; the earth is supposed to be removed, and a breach made in the bricked subway showing the interior. It is suggested that the walls of the subway should be covered with a vitrified surface, in order to assist in the insulation of telegraph and telephone wires. The several services of water and gas are shown, capable of being turned on and off as may be required by the occupants of dwellings. As the walls of the subway will be necessarily low beneath the surface in order to intercept sewage, it is urged that a very large number of telegraph and telephone wires can be placed at the service of the public. Model No. 4 shows a tank placed to receive sewage discharged from houses by the usual trapped drain pipes. Within this tank there are two compartments, formed by galvanised iron network, one compartment being charged with crushed flint (alone or in combination with lime, &c.), and the other compartment with animal and vegetable charcoal (alone or in combination). The sewage having descended into the tank, the water conveying the same will then filter through the said compartments, and finally pass to the street sewer or drain. When required for works on a large scale, a perforated inner tank can be used in place of the screened compartments before described. In all cases it is proposed to divert the waste water of cisterns, sinks, baths, rainfall, &c., in order to avoid passing through the sewage tank.

Another exhibit apparently somewhat in the same direction, if we may judge from the description in the catalogue, was to be shown at Stand 495, by Messrs. Lewis Olrick & Co., but up to Wednesday afternoon last it had not made its appearance.

At Stand 496, Mr. H. King, builder, of High-street, Kensington, exhibits models and plans which show him to be actuated by a laudable desire to apply correct principles of sanitation to the houses which he may be called upon to build or remodel. Although the section which he exhibits is apparently not drawn to scale, so far as we can judge from a cursory inspection of it Mr. King seems fully to understand what means to take in order to keep a house free from sewer air. There is nothing new in his proposals, which involve the use of several well-known appliances for disconnecting the house-drains from direct communication with the sewer. But Mr. King, with the view of showing how the sanitary arrangements of a house should not be carried out (unless it be the object of the builder and plumber to lay on the sewer-air direct to the rooms, and even to the cistern, of a house), exhibits a companion section, which, to be initiated, contrasts strongly with the one showing the right method of doing the work. Mr. King's name and ad-

dress are as prominently given on the one as on the other, and those who do not stop to examine them and to read the explanatory writing on the sections may be apt to conclude that Mr. King is open to undertake work according to either plan. To avoid this impression, Mr. King should label his "frightful example" with some such motto as "How not to do it."

Stand 497 is occupied by Messrs. Candy & Co., of Chudleigh, with a variety of sanitary stoneware and pottery, good of their kind, but calling for no special remark. A speciality worth the attention of visitors to this stand is the new paving brick, named the "granite vitrified," which seems to possess many of the good qualities of the blue Staffordshire brick, while, at the same time, it is of a more pleasing colour.

Stands 498 and 499 were not, at the time of our visit, occupied by the exhibitors to whom they are assigned by the catalogue.

At Stand 500, Messrs. Henry Wadsworth & Son, of Halifax, show their patent wheels and axles, the only right which they have to a place in this section of the Exhibition consisting in the fact that they are applied to the "Wadsworth" patent tipping waggons and carts for the removal and discharge of house and street refuse,—these being shown by models. The patent wheels seem to embody improvements of marked value.

Stand 501 is occupied by the Imperial Stone Company, who exhibit their material as applied to the construction of pipe-sewers of large diameter. Shone's ejector and other specialities are shown at this stand, the visitor to which should inspect the material called "Petrol-silicon," which forms an excellent and durable pavement for basement floors, stables, laundries, &c.

Messrs. Banner Bros. & Co., of Billiter-square, are the tenants of Stand 502, and they show their well-known appliances for house sanitation, which have been largely used and appreciated. A speciality at this stand is Banner's Patent Hollow Kerb, for use in town streets. The interior of the kerb, which is made of artificial stone by Messrs. W. B. Wilkinson & Co., of Newcastle-on-Tyne, is provided with two hollow channels running parallel with each other, and readily accessible by the removal of lifting-pieces at intervals. In these days of the extended and extending use of telegraphy and telephony, this invention of Messrs. Banner ought to find favour, for while overhead wires are thought to be dangerous (as they certainly are unsightly), the continual pulling-up of the street pavements in crowded thoroughfares to relay or repair telegraph wires is a source of great expense and inconvenience.

Messrs. Broad & Co. (Stand 503), of Paddington, exhibit a very good collection of sanitary pottery and appliances for the trapping and ventilation of drains. Their improved inspection gully, in white enamel stoneware, is a very good thing, and is well adapted for use as a grease-trap. Field's channel syphon, and Broad & Co.'s improved reducing channel syphon, for accelerating the flush of drains with a minimum flow, are among the other things shown at the stand. At the adjoining stand the Bountrehill Colliery Co. (for whom Messrs. Broad & Co. are agents) exhibit their excellent white-enamelled fire-clay sinks, cisterns, troughs, &c., of which we spoke in connexion with a former exhibition.

We have now dealt with the whole of the exhibits in the South Annex up to the time we visited it, and next week, as before stated, we propose to notice the sanitary fittings in Class XXIII. But before closing this week's notice we step across to the East Annex to look at the very complete and instructive series of models and plans which are exhibited by the Manchester Corporation, and which, although placed in Class XXIII, have much in common with the exhibits which are in the South Annex. These models and plans serve to show the entire method adopted by the Manchester Health Committee in disposing of the refuse of the city. First in order is shown a model of the Manchester cinder sifting or pail closet, constructed of the full size of the closets usually erected in connection with dwelling-houses in the city. The pail under the seat is sufficiently large for the use of a family of six persons. The cinder sifter is placed on one side of the closet, and is intended to screen the ashes from the cinders of an ordinary fire, which, when taken from the fireplace are put into the opening at the top. The fine ashes falling through the perforated screen are conducted by a shoot

into the pail, where they deodorise the fumes already there, whilst the cinders fall to the bottom, whence they are removed by a small door, and may be again used as fuel. In the recess behind the closet is a dust box or bin into which can be thrown, either through the opening at the side or the double doors at the back, all the refuse from the house. At the back of the closet one of the doors swinging from the top opens inside, and is used by the occupants of the house to which it belongs, the bottom door of the pair slides upwards like a railway-carriage window, and is there fixed, whilst the men whose duty it is to seal the pail hermetically by fastening upon it the cover, remove it, and put a clean one in its place, when the door is again lowered. Next is seen a model of the Manchester commode for use in a sick room or other place in which it is not convenient to erect an ordinary closet. It is lent temporarily for emergencies, where numbers of people are expected to congregate, as at exhibitions or congresses, the Corporation taking charge of the commodious during the time they remain. The pail and cover are made of steel, with solid top and bottom rings, and galvanized. They each hold ten gallons, and with slight repairs will last about ten years. The top and bottom hoops, the handles, and the lugs whereon the lid is fastened, are used up again. The cover is made of iron, with a steel spring and a flanged tubular indiarubber ring on the under side, so that when the lid is pressed by the spring on to the top of the pail the latter is hermetically sealed by the tube. A model of the Manchester collecting van is exhibited, made one-quarter the full size. This is used for collecting the pails and domestic refuse. The four compartments receive twenty-four pails, and the space at the back will contain the refuse from twenty-four houses. The van makes twenty-eight journeys per week, carrying from the depot twenty-four clean and empty pails each journey, and bringing back again the full ones. Two men accompany each van, and they travel about sixteen miles per diem. The van is drawn by a single horse. There are also shown models of boilers used in the sanitary works, specially constructed for generating steam by the consumption of the house refuse named. The furnaces are large, and the heating surface great, there being inside the boiler thirty-three conical tubes and four pockets. About ten tons of refuse is consumed in twenty-four hours. There are also shown models of apparatus for manufacturing feces and garbage into concentrated manure; and of apparatus for converting house refuse into bricks (this group representing machinery which will convert about twelve tons of house refuse into 4,000 to 5,000 bricks); samples of sanitary soap, oil, candles, and concentrated manure manufactured from dead cats, dogs, and fish, slaughter-house refuse, and animal matter; together with plans and sections of the sanitary works themselves, which are situate at Holt Town.

THE HOUSING OF THE POOR.

THE works exhibited in Class XXXII. of Group 3 comprise publications and models, diagrams, &c., relating largely to the means of housing of the poor. On the whole the exhibits show no great advance upon those which have gone before, and this is more surprising and disappointing considering the attention which has been called to the subject, not only by those who were in a position to offer advice and sympathy only, but also by those who were in a position to give material help by means of their social influence, and the still more valuable and irresistible strength of money. The "bitter cry" has penetrated far and wide, but the echo has been lost amid the chaos that seems to prevail in quarters where the most substantial aid should be looked for. There is no disguising the fact that the main question of housing the poor has yet to be faced; to shelter the well-to-do artisan is not a difficult matter, as he can afford to pay for the accommodation, and accordingly his wants are immediately supplied,—in fact, much in danger of being over-supplied, as the inexorable law of demand and supply in these go-ahead times soon makes its position clear. Like all other great social questions, it cannot be settled off-hand, and there is no doubt that time must be the factor by which to measure the result, and that result is yet far off. Notwithstanding the efforts that have been made by philanthropists, whose endeavours in this

direction have, from causes perhaps beyond their own control, been diverted from the main point at issue, the matter of pounds, shillings, and pence still manifestly holds considerable sway over the condition of those who never own the pounds, but have great difficulty in obtaining the shillings and pence. Land in London, even in the vilest quarters, has a speculative value, in addition to its intrinsic worth, that, unless it can be acquired at the latter quotation, leaves but a poor chance for those whose only speculation is as to where they will be able to earn their weekly rent. Thus it is that the very poor find themselves constantly driven from their homes, such as they are, to make way for "model dwellings" which are infinitely beyond their means or ambition. Some of these buildings, where the site has been acquired at a reasonable price, and judgment shown in the building, are able to pay 10 per cent. upon the outlay, to the benefit of whom? Certainly not the class who most require it; and not until the same buildings return only say one-third of that amount shall we be nearer the solution of the question. But we must take the question as we find it, and be thankful to those who are doing their best to bring about so desirable a result; and that there are many earnest workers continuing in the field the present Exhibition will testify.

Foremost amongst the examples shown are those of Mr. Edward Clarke, who has had great opportunities and experience, and has turned them to good account; and the numerous sites, apparently of an awkward nature, with which he has had to deal are treated in a manner which shows a good grasp of the subject. The rooms are well lighted, but if anything too large—at least too large from the speculative builder's view, where, with land at so much per foot, they can hardly afford to throw in a few extra feet. There is very little waste in passages or angles, a fault very noticeable in the earlier attempts of the pioneers of this movement. The illustrations show variously three, four, five, and six stories above the ground-floor, and in some cases the ridge is finished with an iron cresting. This is rarely necessary, and adds to the cost without any corresponding advantage. There is one peculiarity in the plan which, perhaps, in practical working would not be any disadvantage—that is, the separation of the living-rooms from the bedrooms by a corridor upon which they all open. Thus we have four living-rooms side by side, with the bedrooms opposite. There is a hopeless confusion as regards the numerical order of the exhibitors in this class; in fact, the distinguishing numbers are altogether absent, so we must take the plans as they present themselves; and the next of importance that we come to are those of Mr. Clement Dunscombe, the City Engineer of Liverpool. Here is a very large site to deal with, and only a small proportion is covered, leaving a large quadrangle in the centre, which doubtless forms a very useful playground, as well as preserving a large open space, which Liverpool certainly requires as much as more favoured cities. The question of light here is unrestricted, as has been apparently the question of cost, for the excellent contract and working drawings show a determination to have everything of the best, and plenty of it. The living-room fireplaces show a hot-air flue and exit, an oven, and, in fact, a small kitchen complete. The exterior shows a rather elaborate treatment, with shops on the ground-floor—upright lines finished with brick pediments, filled with the usual carving. Whether the Liverpool artisans and labourers earn sufficient to pay for such luxuries is a question for themselves to answer.

Mr. Jas. Webster shows a very small but sensible treatment of an awkward site: it consists of two sets of two rooms on each of three floors. Externally it has a simple elevation, with a little awkwardness about the gable, but it contains more character than many more ambitious attempts, and is more nearly allied to the class of work which pays its way.

Some old friends re-appear in the perspective drawings of the houses on the "Artizans', Labourers', and General Dwellings Estate," Hornsey, by Mr. Rowland Plümbe. We are not treated to the plans, but as these are only two storied dwellings with pleasing appearance, we take it for granted that there is not much room to go wrong, and, indeed, from such a quarter we do not expect that it should be so. If the agitation on the Northern Railway lines for third class season-tickets should have any good

result these attractive houses should further advance in favour, as there is a very homelike and independent air about them.

Mr. Joseph Wall shows a simple rectangular plan apparently free from difficulties as to light and surrounding owners. He is the only exhibitor who gives a detailed cost of the transaction from first to last, giving the price of the land at £7,000 per acre, and the average rent of each room at two shillings per week. He shows a return of 5½ per cent. on the outlay. Although the aggregate cost of the block is given, the price per room or the price per cubic foot is not stated. This would have enabled one to arrive at a more reliable estimate, as all the outgoings and similar details are fairly stated. There is a note on the drawing to the effect that buildings of three or four stories can be built more cheaply than those of a loftier structure. But this depends entirely upon the price of the ground or the amount at which the ground rent is fixed; for if, as is usually the case, the buildings are erected on valuable ground, it is the upper floors that show the profit and help to redeem the cost of the lower ones.

The Improved Industrial Dwellings Company send some very poor drawings of the buildings on their Edgware-road estate—the usual rectangular plan in parallel blocks; and, having plenty of space to deal with, no ingenuity has been required to meet the difficulties which often give rise to a good plan. The elevations are commonplace, but look better in the photographs of similar work. An interesting map is also shown, with red discs placed so as to show the vast operations of this great company. No site seems too large for them, and none too small, for we find at Mile End they cover nine acres of land and house 1,045 families, and at Pentonville a small block shelters only twenty families. These drawings submitted form a useful study, as there is considerable variety in the design, although it is not of a high class; and those who are interested in the question may see the various points contrasted in a way that offers useful suggestions. This company claims to have housed twenty-five thousand people in 16,766 rooms, at a cost of £390,000, making an average of £38 for each person and a cost of about £50 per room. This, we suppose, is exclusive of cost of site, and their experience must have led them in more economical ways of late, as these figures compare very favourably with the earlier results. Some interesting photographs show the crockeries which have been demolished to make way for the various new buildings, and, to judge from the squalid surroundings and miserable tenements, these sites should have been acquired at very reasonable figures. The plans of the buildings on the Soho estate for the same company show the old tendency to cutting off corners and forming inconvenient angles. Not that such in itself is awkward in actual use, but it makes more difference in the cost of building than is generally supposed, and individuals building for themselves with a view to letting or selling such property always pay considerable attention to such apparently small points. The National Dwellings Society show a straightforward plan with only one scullery to eight rooms. This, if used for the purpose which the name indicates, would lead to much disagreement; but as in reality the tenants are accustomed to wash anything anywhere it would be more likely to become a general laundry, and the domestic arrangements of the scullery would be confined to their own rooms. A very ambitious work is shown by the Lambeth Dwellings Company, designed by Mr. E. Hoole, who has said and written a good deal upon the subject lately. The plan is simple, with a long gallery at the back; the closets are all together, twelve of them leading off each landing, forming a latrine which is treated externally as a separate feature, with crow-stopped gable, pointed arches, and long louvres. This may be useful as regards its sanitation, but we think can scarcely be pleasant in actual working. The elevation generally is very elaborate, with shops on the ground floor facing the main street; a mezzanine floor and pointed arches generally to the bays, with a very solid-looking corner tower with a high roof, and in this case, unless the shops and lower floors pay for the upper ones, we are at a loss to know how the returns can meet the expense of building. The Society for Improving the Condition of the Labouring Classes seems to require waking up; they send

no plans except for a few small, old-fashioned cottages and small buildings, but yet there are large coloured drawings of good-sized blocks which certainly bear away the palm for ugliness, for here we have realism and cheapness in bricks and mortar carried to the verge of exasperation. Some plans and details of hollow walls, chimnies, windows, &c., for dwellings carried out for the Prince Consort, and exhibited at the Great Exhibition in Hyde Park of 1851 are also shown, and as far as we can judge little progress has been made with them since. If this company has anything better and newer to show, it would be well for them to do so, as these are by no means representative. Far away in the Central Gallery, amidst the fitted apartments, are two isolated examples, one being a large block for the Metropolitan Railway, proposed to be built in the Minories in substitution of the dwellings demolished by the construction of Tower Hill Extension Railway. There is nothing uncommon in the plan. It has shops with elliptical heads on the ground-floor, is sensibly and simply treated, and likely to be useful in its way. Dr. Greene and Dr. Blyth exhibit plans and model of a single tenement arrangement, one of them being a room 20 ft. long, divided at night by folding screens into three divisions, the screens folding back against the walls when not in use. This has economy of space and material to recommend it, and would probably answer very well in practice.

Taking the exhibition of these works generally as represented here, we see no reason to conclude that much has been done except in the magnitude of the transactions, and it yet remains for private enterprise and competition to meet the requirements of the very poor, which perhaps may be done in some degree by altering and adapting existing buildings; but if we adopt a levelling up process, instead of a levelling down one, care must be taken not to aim too high and overshoot the mark.

FOOD AND ITS PREPARATION.

In attempting to write a connected description of that part of the Health Exhibition devoted to food (Group I), one is met by the difficulty which is nearly always encountered in work of this kind. Exhibitions are generally disappointing to the specialist, and popular exhibitions must necessarily be so. The specialist wants concentration, the same detail repeated over and over again, in all its minute ramifications, until the subject is exhausted; whilst the general visitor asks for variety, and cares nothing for accuracy. As it is the general public that pay for shows of this nature, the specialist must be content to put up with what he can get in the way of scientific completeness, and learn to be thankful for small mercies in the way of accuracy.

It is with a feeling something very like despair that we approach the present section of our work. The subject is so vast, and some of its minor branches have been given such undue prominence by their exhibitors, whilst others of greater importance are barely represented, that it is difficult to know where to begin. For the present we purpose treating this branch of our subject in a general manner, reserving any detailed notices we may give until a future date.

By the official classification, which has been arranged by a special sub-committee, the food-group is divided into twelve classes. Two of these may be discarded at once, as the whole of the exhibits in them are relegated to other divisions. These are classes six and ten, consisting of cookery and literature respectively. The remaining classes are as follows:—

- Class I. Unprepared animal and vegetable substances.
- Class II. Prepared vegetable substances.
- Class III. Prepared animal substances.
- Class IV. Beverages of all kinds.
- Class V. New varieties of food.
- Class VII. Chemistry and physiology of food and drink.
- Class VIII.—Diseases due to unwholesome and improper food.
- Class IX.—Practical dietetics. Army and Navy rations, &c.
- Class XI.—Apparatus and processes for conserving, storing, and distributing fresh foods of all kinds.
- Class XII.—Machinery and appliances for preparation of articles in Group I.

The arrangement will be seen to be one of a

very general nature. It is doubtless well designed for classifying exhibitors belonging to different branches of industry, but does not lend itself very readily to our present purpose of description. All these classes are placed in the South Gallery, which last year was devoted to the British deep sea fisheries. In Class XII., however, a large number of the exhibits are in the machinery-in-motion department, which is placed in the Western Gallery and Annexe, whilst the bakeries are situated in the East Corridor. It is Class I. that confronts the visitor as he passes down the few steps which lead from the entrance-hall to the South Gallery, and the first things to attract attention are models of the gigantic specimens of different vegetables exhibited by Sutton & Sons, of Reading. Monstrous as these appear, they are all exact reproductions, so far as dimensions are concerned, of actual specimens grown from the seeds of the exhibitors. There are French beans as big as cucumbers, cucumbers as large as pumpkins, whilst the pumpkins themselves are simply absurd in their overgrown proportions. It may be doubted whether these Brodringnagian vegetables would possess a flavour equal to those of more ordinary size; and this part of the display may, perhaps, be looked on as perhaps rather curious than practically useful. James Carter & Co. have an instructive collection of some of the principal vegetable food-products of all countries. The seeds, which are their great feature, are well-arranged in different groups; comprising seeds used direct as food for man; seeds producing plants used as food for man; condiment seeds; oil-yielding seeds; seeds for bees; and seeds producing dress fabrics. The next attractive stand in this neighbourhood is that of Rowland Ward & Co., the well-known naturalists. This firm has in one case a very complete poultry-yard, the specimens being most excellently mounted and set up. Two enormous Aylesbury ducks would go well with some of Messrs. Sutton's gigantic vegetable specimens. A second case exhibited by the same firm is principally noticeable for a spirited representation of a cock fight, to which has been attached the expressive label "large sums changed hands." Taxidermy is well represented in this section of the Exhibition. Kellich & Son show some finely mounted heads of oxen. E. G. Meek has a case of stuffed water-fowl of the conventional type, and under a dome-topped glass shade a pair of the everlasting scarlet ibis which it seems to be the ambition of every suburban taxidermist to produce. R. B. Spalding has a natural group of a vixen and cubs, about the last things that would be likely to form human food, but to make up for this, Mr. Spalding shows alive some edible snails, which it is to be hoped taste nicer than they look. G. F. Butt has a big case, a stuffed prize heifer being shown in full, though the heads of a Devon and Scotch steer are far more attractive. Thomas E. Carwardine has a thoroughly useful collection. He shows the various flour and meal products which he manufactures and supplies direct to the public. Mr. Carwardine seems to have little faith in the London baker, and thinks the only chance the householder has of getting good bread is to make and bake at home; using, of course, his flour.

E. Goodwin has samples of Russian, French, Dutch, Australian, and American hops, together with several specimens of our own Kentish and Worcester hops of last year. An American 1883 sample is particularly noticeable for its large size and good colour. E. Webb & Sons, and J. C. Wheeler & Son, have two large and excellent collections of seeds, a specimen of beardless barley, by the former firm, and a bold sample of Italian rye-grass by the latter, being well worthy of attention.

Class II. comprises a vast array of material, but a good many of the exhibits are not of an interesting nature. Many firms appear to look on the exhibition as merely a means for obtaining a large, gratuitous advertisement. A notable instance of this is the big show-case of the large Reading biscuit-making firm. Why these people should be allowed to occupy so much room in the most important part of the exhibition it is difficult to imagine. Messrs. Huntley & Palmer might have made their display a very interesting one if they would have followed the example of Messrs. Barnett & Foster, the mineral-water makers, J. & J. Colman, the mustard makers, F. Allen & Sons, the confectioners, or any of the firms who have given practical illustrations of their process of manu-

facture. No charge is made for space in the exhibition, and it is to be hoped that some means may be taken in future years for preventing such an abuse of the conveniences offered. In this class a good many of the most important exhibitors have not yet completed their arrangements.

An interesting exhibit in this class is a model of a kiln of novel construction shown on the stand of Turner & Co., of Bethnal-green. Samples of maize, corn meal, hominy, malt-flour, and other products of the kiln are shown. Unfortunately, the exhibitors were unable to obtain the space required, so that the exhibit is not so complete as it was intended to be.

The Vegetarian Society are included in this class. They have a dining-room adjoining the Dairies, where meals of three courses are served for sixpence. Several firms exhibit gluten bread and other diabetic articles of diet—the stand of G. Van Abbott, who is well known in connection with such matters, being especially noticeable. The rest of the exhibits consist of samples of flour, meal, biscuits, cakes, tinned goods, pickles, sauces, jams, confectionery, and objects of a like nature.

In Class III. the Aylesbury Dairy Company show Koumis, made according to Dr. Jagielski's formulae, and also by a method of their own. The same company have a special milk food for infants, peptonised milk and "sparkling bland," which is a description of Koumis. They also prepare whey and buttermilk; the latter an article all but impossible to procure in London a short time ago. It is to be regretted that this influential corporation is not more fully represented.

The Condensed Milk Company of Ireland show samples of their produce, which, judging from the analyses submitted, is of a high quality. Salt forms a small but interesting feature in this class, the exhibit of Weston & Westall being, perhaps, the most noticeable; whilst Bunstead & Co. and Manger & Son exhibit table-salt, agricultural and various other kinds. Gridley & Co. exhibit raw isinglass, and Jubal Webb has a large and pungent collection of cheeses, hams, and other provisions. The rest of the exhibits are mainly composed of tinned meats, soups, and goods of this nature.

In Class IV. the most noticeable feature is the big tun of the Tottenham Lager Beer Brewery. Wines and spirits in bottles, and mineral waters of more or less well-known descriptions, complete the list. A novel feature is introduced by Christmas & Co., of Worplesdon, who make wine in England from foreign fruit, and adopt the Continental system of "disgorging" to eliminate the sediment from fermentation.

In Class V. Savory & Moore's exhibit is interesting. Squire & Sons' case is also worthy of notice, a very clear example of malt extract being shown. Barff & Wire exhibit a new stimulant called Kroechyle, which has been well spoken of lately as a food for invalids.

In Class VII. the leading feature is the interesting series of exhibits illustrating the Chemistry and Physiology of Food, which has been brought from the Bethnal Green Museum, by order of the Science and Art Department South Kensington. Some of the models are not very artistic, and the whole collection has lost a good deal of its original gloss; but it affords a ready means by which people may readily acquire a good deal of information on a very important subject if they will take the trouble.

The exhibit of the Parkes Museum of Hygiene is not worthy of the important institution it represents. John Knight & Son's case, in which a specimen of oleo-margarine is shown, attracts a good deal of attention.

In the remaining classes there is little calling for notice. Maignen's excellent filter is exhibited, but requires no further explanation in this connexion. A saucepan with a perforated lid, closed at will by a slide, is a simple but useful contrivance, which will be a useful addition to the kitchen. George Kent has a stand described as containing sick-room requisites, but which is occupied principally by his well-known knife-cleaning machine. Many of the remaining exhibits are in the machinery-in-motion department, which will be treated of under another heading.

The dairies form a most important section of the Exhibition. These, and the almost equally important bakeries, we shall reserve for another occasion.

We propose to continue these Supplements from week to week as may be necessary.

From the Great Fire of London, that is to say, and the career of Sir Christopher Wren, to the burning of the old Parliament House and the career of Sir Charles Barry, there extends a period of English architectural history which represents the whole development of popular Neo-Classicism, from its rise to its fall; from St. Paul's Cathedral and Greenwich Hospital to St. Pancras Church, the National Gallery, the British Museum, the club-houses, and the plaster façades of the Regent's Park; when it was time at last that some change should come; and, if only as an enigma for your consideration, I think I see at the very beginning of this manifestation and at the very end the two most conspicuous masters of the situation, with no equal between. Perhaps I may go on to remark, as a coincidence, that from Barry's day to our own there extends the course of another remarkable architectural development, with its most powerful and characteristic exponents again at the beginning and at the end, Pugin and Street. I commend these circumstances to the curious: at the moment when Barry in his Club-houses offered us a new version of Wren's Classic, we threw it over and reverted to Gothic; and at the moment when Street in his Law Courts has brought Pugin's Gothic to supremacy, we now cast that aside and return to Classic. Such is the play of action and reaction; art is a long story, but its chapters are short.

At the commencement, then, of the Victorian age in which it is our privilege to live, this was the condition of architectural art in London. Sir John Soane, in old age and retirement, was the efficient representative of the best commonplace Greek taste. Cockerell, his successor in the professorship of the Academy, was the much more brilliant and accomplished exponent of the higher theoretic level of the same school. Smirke and Hardwick, on the lower ground of more successful business, were of still the same order of designers. Wilkins's National Gallery and University College had been produced as exemplars of what Anglo-Greek ought to be, and had failed to secure the popularity expected. Barry, whose age was under forty when he stood on Westminster Bridge staring at the conflagration of the Parliament House, and dreaming inexpressible dreams,—had designed his two club-houses in Pall-mall in a novel mode, and had received the applause which had been denied to Wilkins. I need only add that at the newly-established Institute, Tite, as a representative of the rude energy of a prosperous commercial practitioner and an adherent of the convenient abstract eclecticism of the thorough man of business, divided the leadership with Donaldson, most indefatigable writer and speaker, to whose entranced intelligence the study of architecture was a worship, and its miraculous origin in far antiquity a faith that never could be shaken. The extreme refinement of the state of opinion which I have thus indicated was endowed with shape and purpose by the Society of Dilettanti, under whose authority the latest and most characteristic enterprise of a long series was undertaken a few years afterwards by Mr. Penrose, in his elaborate admeasurements of the optical corrections of the Parthenon, the supreme and final outcome of a system of criticism which the world can never now be at the trouble to revive.

The inevitable operation of the natural law of reaction and revolt had meanwhile been producing in many minds a feeling of antagonism to this attenuated and traditional Classic. Romanticism, in short, of the more robust order had begun to despise criticism so effeminate and so frigid. Now, English romanticism takes two forms,—ancestor-worship and ecclesiasticism; and in both of these forms a change was coming over architecture. The Oxford movement, or High Church movement, or Medieval revival,—call it which you will,—was acquiring force in the Church; whilst as regards the State, no sooner was it understood that a new palace of the Legislature was to be built on a grand scale, and that Sir Robert Smirke, as one of the standing architects of the Government, had been commissioned to prepare the design for it, than members of Parliament began promptly to agitate for a patriotic adoption of what was then designated the Baronic style,—“Gothic or Elizabethan” was the phrase eventually accepted,—and for the transference of the architect's retainer from the hands of the prosaic Smirke to those of some unknown romanticist, who should be selected by means of a public competition. Barry won the prize; and at the present moment, when an enthu-

siastic belief in the virtues of competition has been revived, in the hope that “fair-play” will cure all evils (and fair-play seems as coy as ever in answering to the call), it is interesting to remember that the fairness of the selection of Barry's design was never challenged by any criticism more severe than this,—that the favour of influential friends at court had not been refused, and that the ablest specialist assistance had been wisely secured.

The adoption of this design for the new Houses of Parliament consummated the Gothic revival. The baronial idea instantly took the fancy of the public; it formulated an innovation, allayed a disquietude, and satisfied the demands of a genuine reaction. Churches, it was true, had been built for some time in various kinds of pointed arcation; castles also had been built for patriotic squires, even by Wilkins himself, with Gothic arches of no particular form, and some of them with Gothic cannon,—cannon of wood frowning ornamentally from embrasures of stucco; cathedrals also had been restored by the help of cast iron and compo; and London dining-rooms had been ingeniously adorned with tracery cut out of thin deal, and grained and varnished; but now all this was to be improved upon. Pugin fulminated his anathemas against everything that was spurious, everything that was pagan, everything that was modern; even the dainty engravings of Britton and Le Keux's cathedrals were supplanted by the masculine lithographs of a new school of travelling sketchers; Ruskin arose, as the prophet of a mysterious gospel unknown to the multitude; and England found itself at the commencement of an incomprehensible architectural civil war.

The contending parties gradually organised their forces. One called itself the Gothic party; the other the Classic party. There was a third, stronger than either in all but enthusiasm, which called itself the Eclectic party. At first, indeed, the Gothicists, like all originators of revolution, had to content themselves with the pleasures of hope, and to console themselves with the exercise of scorn. England is the home of compromises, and it was at length agreed that Gothic should be recognised as the proper mode for churches, Elizabethan for country houses, and Italian Classic for municipal buildings. It was agreed also that every individual practitioner should be permitted to do his best in all three styles, or, indeed, in any other he pleased, and to claim the respect of the world for so doing. Cockerell, in his Royal Academy lectures, pleaded earnestly for what he called catholicity, or universal forbearance. Donaldson, at the Institute, consented to accept the supernatural, to a reasonable extent, in Gothic as well as Greek; Tite had already actually taken a lead in Gothic design by his Scotch church in Bloomsbury; but, strange to say, Barry, the accepted prince of the practical revival, was at heart its enemy. I believe it is quite understood that, if the Government could have been persuaded by him, the Palace of Westminster would have been built after all in the stately style of the Italian Renaissance.

I ought not to omit to mention that at this time the architectural press, as we now understand the term, may be said to have been founded. I allude, of course, to the establishment of the first of our weekly newspapers.* Previously the *Civil Engineer and Architect's Journal*, a feeble monthly magazine, was the only organ of the profession, and necessarily one of very imperfect influence. The progress of architectural and engineering journalism separately, since that day, I need only say, has been most satisfactory; and I cannot help alluding especially to the remarkable development of the weekly illustrations of English architectural art, which cannot fail to be of immense artistic value throughout the world.

The year 1848 soon arrived. I need not remind you that it was a year of European revolution, out of which France, throwing off once more the embarrassments of tradition, entered upon a new and strange national career. For two hundred years Paris had been the focus of artistic culture, but of late the vivacity of the people had scarcely been seconded by the example of the Court. The Government now passed into the hands of a peculiar class of adventurous men of affairs, determined to purchase unlimited power for themselves at the price of unlimited luxury for

the people. The arts do not inquire too closely into the character of their patrons; and whatever others may have to say of Napoleon III., architects must always hold his memory in honour for the artistic brilliancy (to say nothing of political wisdom) of the architectural operations which he so successfully conducted.

English architecture had not hitherto sought for inspiration in Paris. Neither, indeed, does it now, and I venture to think it never will; for, vastly as I admire all French art, I can never divest my mind of the feeling that I am admiring something whose charms are feminine. I say, therefore, that England, the very home of rough-and-ready masculinity, will probably never follow the precise formulas of French taste. But it was impossible that the new start which the French were making in social display in 1849 should fail to exert an influence upon English art in one way or another. The inauguration of the great system of international exhibitions brought this influence into play; and the years 1851 and 1855, taken together, produced a crisis in English architectural history which is now seen to have been almost more notable for its results than any other incident of the kind in modern times.

When the Exhibition of 1851 was opened, our professional world stood thus. The Prince Consort, now at the enterprising age of thirty-two, had become an important agent in the progress of general culture in his adopted country. It was soon understood that he had a considerable respect for architectural work, but that he had not the same regard for English architects. Perhaps this was partly due to the fact that the criticism of artistic building was in the confusion I have lately described, and that it occupied indeed what must be called low ground, a sort of unscentific squabbling ground to which a high-class German intellect might scarcely see its way to descend. Amongst the public duties which had come to be imposed upon him, one of the most prominent was the administration of the artistic completion of the new Houses of Parliament; and we may suppose him to have thus become deeply impressed with a sense of the tradesmanlike condition (if the phrase may be excused) in which he found popular English architecture and its auxiliary arts as a whole,—a quality which is now candidly recognised as having been only too forcibly manifested in those days. I do not wish to attach to Prince Albert the character of a personal leader,—it would be false criticism to do so; but I think he was a particularly good representative of an impending change in the public intelligence of England; and it is no doubt the fact that the very peculiar unpopularity of the profession of architects, which, during the last fifteen or twenty years especially, has been so frequently exemplified to our cost, took its rise in the early days of the Prince's intervention in architectural affairs. The standard-bearers of the day, let us remember, were Barry and Pugin, Ruskin and Fergusson, Scott,—or rather Scott & Moffatt,—and Donaldson and Tite at the Institute. Barry's work at the Houses of Parliament was advancing tediously and mysteriously, and a sort of Philistine grumble against it was constantly being heard in the House of Commons, as if the architect and the Legislature were not pulling together. Then Pugin, as the exponent proper of the Gothic Revival, although acting as Barry's very loyal ally in the great work itself privately, was, in his public capacity, simply a frantic enthusiast, whose fanaticism for the Medieval, in season and out of season, that and nothing else, made confusion worse confounded. Of Ruskin, again, one can only say,—and all the more confidently now that he has in age turned against himself in youth,—that the specious, reckless, often meaningless rhetoric of his charming writings stirred up a vague and spurious sentimentalism, which, without benefiting architecture, was doing infinite damage to the architect. Fergusson, next in order, although as dogmatic as Ruskin, was as prosaic and cool as Ruskin was poetic and impassioned, and as well disposed to the working architect as Ruskin was scornfully inimical. But he cannot be said to have helped the profession, by his very considerable services to the art, so much as he unconsciously disparaged in the eyes of the public an order of artists who required an amateur to teach them. I have next mentioned Scott & Moffatt. For the moment I do not see the great ecclesiastical designer of a later date, but only the firm of reckless public competitors, in whose hands

* The Builder, established in 1842.

the abuse of a practice, always signally open to abuse, had already attained dimensions which could not fail to bring down sooner or later a dignified æsthetic profession to the level of a grasping trade. Much as I revere the memory of Sir Gilbert Scott, I feel that I should be false to my duty at the present moment if I were to hesitate to blame him, and his too clever partner of forty years ago, for their introduction of a mode of struggling for work at any price, which I believe to have done an amount of injury to English architects only less than that which, I am sorry to say, I think it has yet to do. I have spoken lastly of Donaldson and Tite at the Institute. Of Professor Donaldson, I need only say that so far as a high-minded and fearless maintenance of the lofty character of our splendid art and its literature, and of the honourable historical position of our artists, antiquaries, and critics could defend us against assault, whether vulgar or refined, he never for an instant swerved from his duty as leader of the guild; and of Sir William Tite, although a man of very different qualities, I am glad to say, from personal knowledge, very much the same. By this time, I may add, Professor Cockerell, who never was wanting in courage to champion the cause of his order, could scarcely be called upon to be more than a looker-on.

I must now speak of that remarkable man, Henry Cole, whom I regard as having taken an exceedingly earnest and effective lead in the change that was coming over English art architectural. I use this term—*art architectural*—in order to suggest to you an important practical distinction between the academical architecture of the period preceding 1851, and the non-academical architectural art in general which then began to take its place,—a whole galaxy of constructive, formative, decorative, and industrial arts being now in question, amongst which the pure building-art of old traditions was but the central star.

Cole had for the work of his life the advancement of what we have been accustomed to call the minor arts; and there can be no doubt that he began upon the basis of a personal dislike to the professional practice of architecture, which he maintained to the end and bequeathed to his successors. Rightly or wrongly, he seems to have arrived at the conclusion that the architect was a fossil, whose function in the streets of ancient Rome, or in the cloisters of Mediæval abbeys, or in the market-places of modern but not too modern Italy, had no doubt been a useful function, judging by the remains of his performances, but who in modern London was a doer of nothing to speak of, or of nothing but what could be done quite as well without him. As matter of business, we know this to be mere folly; there is perhaps nothing in the work of this world which the untrained intelligence can never hope to accomplish, if the proper design of a high-class building be not such a thing; and the continual endeavour of uninformed persons to do their own architecture, in spite of a thousand failures, is only evidence, indeed, of the fascination of the unattainable. Cole, however, seems never to have permitted himself, as so many do, to be an amateur architect, or even to have encouraged any one else to be so; what he underrated was, not art, nor even business, but men. His own soul was wrapped up in detail, and he found the architects, as he thought, to be devoid of the knowledge of such detail, and content to trade upon a little experience merely in the drudgery of supervising building contractors. When he fell in with an architect like Digby Wyatt, who knew all that he himself knew, or could wish to know, of the arts of detail, and who knew also that which he acknowledged to be beyond his own reach, the whole volume of the historical art of splendid building, he could honour him, and did honour him as far as was convenient; but if the mere art of building, without the arts of detail, were alone in question, his opinion was that the Royal Engineers could manage that quite as well as any one need desire, and, indeed, all the better, because of one thing, that they were soldiers under discipline, and not like a good many architects he could name who were not under discipline, and whose successors, if we must tell the truth, are not under discipline yet.

The fact that the Prince Consort had built Osborne in 1848 without employing an architect (although the builder, of course, employed one) may have been encouraging to Mr. Cole when they came to compare notes; but the view of

the matter which I prefer to take, as I have already suggested, is that both of these extremely intelligent and earnest men were in fact exercising shrewd foresight, and not merely cherishing a personal crochot. At any rate, the immediate result of the Great Exhibition of 1851 was to open the eyes of Englishmen to the fact that the subtle spirit of artistic design ought to run through a great many branches of industrial production which they had been accustomed to regard as scarcely worth the trouble. That many of these were more or less related to building, or to the decoration or occupation of buildings, was plainly manifest; and the triumph of Cole was that he had laid a foundation for the popularity of the whole world of decorative arts, and, amongst the rest, the minor arts architectural. The Exposition held in Paris in 1855 carried still further the same idea; and some English architects began to perceive that their studies must go more and more into the detail of general art. Architecture was therefore now on the move in a new direction.

Under the remarkably clever personal administration of Cole, the practical outcome of the exhibitions speedily acquired form and substance in the institution of National Schools of Design, and eventually of the South Kensington Museum. The establishment of the Crystal Palace also at Sydenham, for an artistic popular resort, ought to be coupled with these undertakings, as being a measure carried out with the same end in view. As regards architects, it was no doubt a remarkable, and perhaps unfortunate, circumstance that a duke's gardener had to come in to design the Exhibition edifice, as if to show that it was not in artistic building alone that architects failed to keep pace with the times, but in scientific still more. We are not bound, however, to accept this view of the incident, and certainly Paxton never made his mark in either art or science.

"South Kensington," as it has long been popularly designated, in the character of a somewhat self-assertive bureau of the Government, may, I think, be described as the headquarters of art multifarious, no longer academical, but essentially non-academical. By academical art I mean to indicate, in the restricted sense, the old conventional "circle of the arts" as accepted by the Renaissance academies, comprising painting, sculpture, architecture, and no more, and all on the high level only of dignified tradition. When, for example, no longer ago than 1854, we find Mr. Tite's contribution to the Royal Academy exhibition to have been "A Composition of the Works of Inigo Jones," and Professor Donaldson's "An Architect's Dream, or Sketch of a Design for Opening the Crypt of St. Paul's" (after the manner of the Invalides at Paris), we can acknowledge now that academicalism had reigned quite long enough. We can also acknowledge now, when we have in a great measure enfranchised the practice of the art from such inconvenient formalism, so that our Classic and our Gothic alike are often almost too free in treatment, and too demonstratively defiant of the categorical criticism of the schools, that the practical function of the architect has acquired at the same time extended limits. He can no longer rest content with having provided a building that is merely conveniently planned, properly constructed, and well proportioned, which other hands shall then clothe with decorative work, and furnish with ornamental accessories; there is finishing work everywhere, minor art work, which is part and parcel of his scheme and control; there is characteristic carving, for instance, and he must direct the carver; painting, still more; there may be even set pictures and statuary sometimes; there is metal-work, plaster-work or some equivalent, even paperhanging or some equivalent, and so on; there is floor-work, wall-work, cabinet-work, furniture-work; sometimes upholstery, carpets, tapestry; a multitude of miscellaneous fixtures and fittings, and even unfired ornaments; all of these may more or less put in a claim to be "endowed with artistic merit" by the one designer, lest anything unexpectedly awry should mar the effect of the effect of the whole design. And this great change in the scope of the architect's work has come about, I think, in response to a corresponding change in public feeling, which must be associated with the operation of the South Kensington policy. Indeed, I am almost inclined to say that the *bric-à-brac* style, for such it is, of

what we call Queen Anne architecture, is properly the South Kensington Museum style. Cole personally, the paramount genius of South Kensington, was originally, as Felix Summerley, content to devote himself for ever to *bric-à-brac*. There are cynical critics who will speak of the whole Museum as *bric-à-brac* still. And I, for one, have no objection to this, if I may take leave to identify with the name of *bric-à-brac* the idea of art multifarious and non-academical, that which underlies the entire range of the minor arts, unfornulated often and unconventional, but constituting an inexhaustible source of everyday enjoyment which our Academies, when inflated with the pride of empty traditions, are disposed to ignore rather than attempt to work.

But the Gothic revival, no doubt, is entitled to claim a considerable share in this expansion of the architect's work,—his work, let me say, as chief of all the workmen. Pugin, for instance, was especially an apostle of the minor arts. The Neo-Greek dilletantism that preceded his day, and the Georgian Philistinism together, may be said to have shut the door upon them. It was under the successors of Pugin,—his direct successors in Gothic enthusiasm,—that they acquired the form and force they now possess in architectural business. South Kensington could never, perhaps, have converted the narrow connoisseurship of *bric-à-brac* into an expansive public interest in every possible kind of decorative and ornamental design, but for the fanaticism, as it is called correctly enough, of Pugin and his school. And yet Coleism and Puginism were but unconscious allies, and are no better still. To this day South Kensington recognises little beyond Italian Renaissance, whereas even our Queen Anneists,—themselves stanch Mediævalists quite recently,—would rather have turned to anything else they could find. At any rate, the point I desire to make is this,—that the epoch of the first great international exhibitions is to be identified in the history of English architecture with the rise of the minor arts, which have thus been progressing amongst us for about thirty years.

The Gothic revival must now be described for its own sake. In the language of our popular Protestantism, this great movement was simply a return to the artistic style of the Roman Catholic or Mediævalist Church, of which it has been truly said that it is "the Church of Poetry and Art." At the date of the great exhibitions, Gothicism had got so far as to have acquired not only the undisputed possession of the whole ecclesiastical field in English architectural practice, but the disposition to claim whatever secular work was worth having. The theory that Italian art was only suited to Italian soil, that England required a style that was English, and that the only English style was the Gothic, was boldly advocated; and in 1857, when the Government instituted a public competition for the intended War and Foreign Offices at Whitehall, the competitors were found to be so equally divided in taste between Classicism and Gothicism that the adjudicators felt obliged to place the representatives of the two schools in alternate order for the prizes, to the number, I think, of fourteen in all, as an official acknowledgment of the absolutely equal value of secular Gothic and Classic in public esteem. We all know how in the end Scott's Gothic design was demonstratively selected for execution just before Lord Derby's Administration quitted office, and the style, almost still more demonstratively changed to Classic when Lord Palmerston came in. Such was the Battle of the Styles.

The chief merit, perhaps, to which the Gothic party laid claim was the resuscitation of the Mediæval principle of truthful articulation, or the correct correspondence of the motive of superficial design with the motive underlying construction. The style of the Renaissance, they argued truly enough, were almost hopelessly entangled in shams, whilst the Mediæval, they said, had nothing to conceal or to disguise. This was a great step in the right direction, for false architecture cannot be true art. It is not to be affirmed, however, that our Gothic architects quite acted up to the pretensions of their school; it was scarcely to be expected that they should; the habit of fibbing on the drawing-board, persisted in from time to time of St. Paul's Cathedral (which, with all its merits, is a mass of fibs), had become inveterate in England; and even now the Spartan principle that the facts of construction shall never be compromised in

the design of superficialism is much too feebly recognised.

But the Gothic revival, as soon as it had acquired its full strength, brought about another result not so satisfactory to our professional repute. Architects were now divided into two "camps" (to use the appropriate language of Sir Gilbert Scott), regarding each other with "mutual scorn." English people may fully appreciate in politics the advantages derived from the antagonism of parties, but in art they do not. Consequently, when Gothicists proclaimed Classicists to be, in plain language, foolish brothers, and Classicists said very much the same of Gothicists, the character of the whole profession was lowered inevitably, and the effect was only too distinctly apparent in Parliament and the press. Within the profession itself the authorities were divided in doctrine thus.—Gothicism rested its claims of superiority chiefly upon its qualities of honesty and masculine fortitude, which in the work of Street and some others were soon developed into something like a contempt for the graces; whereas Classicism relied upon the concurrence of all modern Europe in its adoption, and while fully acknowledging the sin of sham, deprecated the substitution of ugliness for beauty, however masculine the one might appear to be, or however feminine the other.

There thus arose outside the profession a new Philistinism. Before many years it acquired unexpected importance by reason of the appointment, quite accidentally, of Mr. Ayrton to the office of First Commissioner of Works. Ayrton was a very Goliath of the Philistines, and when Edward Barry had the temerity to encounter him he went down before him in the most melancholy manner; and unfortunately he dragged us all with him, so that the unpopularity of architects became established as almost a national principle. But it is due to South Kensington to give it most of the credit, or discredit, of this consummation. Cole may be said to have hated not only architects, but all classes whatever of professional artists of the academical order. He regarded their pretensions on all hands alike as a mere traditional, conventional, and spurious self-importance, impeding the progress of those minor arts which he considered to afford the true pabulum for national taste. Accordingly, as a rule, whatever had to be done artistically under Cole must be done, so to speak, non-professionally; and, inasmuch as architecture was the most prominent of the professional arts, it was determined that, when building had to be done for South Kensington itself, the professional architect should be emphatically set aside. The military engineer was demonstratively substituted. Captain Fowke, a young officer of much general ability and of an amiable and well-disciplined nature, was made the representative of this policy. He became a favourite with the Prince Consort; he proved to be a man of large ideas; he entered thoroughly into the new system of artistic enterprise; he made a special study of new materials for design, such as iron and terra-cotta; and he was at once a judicious chief and a judicious subordinate. He died early; but if he had lived longer he could scarcely have accomplished more than he did. His successor, General Scott, carried on his work on the same lines; but Scott, being of a more genial temperament, allowed the architectural world, if not the public, to discover at last the hollowiness of the system, by acknowledging frankly that he himself was no architect at all, even although that very grand edifice the Albert Hall was nominally his personal work. But I need not remind you that, when the Albert Memorial had to be built, South Kensington discreetly made no attempt to commit it even nominally to the artistic mercies of the Royal Engineers.

We have now arrived at a period of less than twenty years ago; and the condition of English architecture was this, as illustrated in the great competition for the Law Courts and the National Gallery. The Battle of the Styles was still in progress, and it cannot be denied that the Gothic party was victorious all along the line. Scott, Street, and Burges were its most prominent champions. Scott had the unassailable leadership in ecclesiastical work everywhere. But the qualities which made him so popular socially with a body of men like the clergy rendered him incapable of maintaining that militant attitude which so much better suited the disposition of his eminent pupil Street. Again and again, in obedience to the call of partisanship, and to the dictates no less

of his own sincere earnestness in the admiration of what we may call the milder Gothic, Scott came forward as a combatant Mediævalist, and even made use at times of language that appeared to be strong. But no one was ever any the worse. In Street, however, the genius of the Revival possessed a soldier after its own heart. Even Ayrton had met his match; and, indeed, such has been the effect produced by the architect's undaunted attitude to the very end of his life, that the lawyers themselves in high places, exasperated at the universal anachronism and anomaly amidst which they are compelled, through sheer force of this one dead man's will, to perform their uneasy business, exclaim against him with bated breath. The third of our great Gothic trio, Burges, was not so much a man of power as of a certain playful fanaticism, which induced affectionate forbearance, and never provoked to wrath. With his intimates he was "Billy"; I wonder if any one ever called Street "George?" But, of the three, Burges was by far the most simple artistic spirit. Scott was a laborious and pushing man of business, with a congenial occupation; Street, a fighting ecclesiastic; Burges, an enamoured boy,—one Low Church, one High Church, one No Church. But these three together represented the triumph of the great Gothic revival; and how strange it must appear to some of us that this triumph, which, like all our little mortal victories, seemed at the time so enduring, is how only an incident of history, and yet but a few years old!

By an ingenious contrivance of somebody's, the urgent demand for new Courts of Justice and the supposed desire for a new National Gallery were so combined together and made the occasion of the brace of competitions alluded to, that Gothic should have its own way with one and Classic with the other. The Classic leaders of the day, however, were neither many nor strong; all the real artistic vigour was now Gothic—romantic. The result of the contest, after the customary vicissitudes, was the appointment of Street to build the Courts of Justice in an Academic style, probably the most severely uncompromising that had ever been attempted in the world of archaeological art. The edifice has but recently been finished. It is a monument of artistic resolution, and, of course, of artistic skill. But it is much more than this. Such is the fearless muscularity of its artistic attitude, such the vehemence of its characteristic Gothic force,—let me at once say ruthless violence,—that without it the whole process of the Revival had been quite incomplete. But, for that very reason, the consummation at length accomplished, it was fit that the great movement should confess itself exhausted. Street died at the very goal, and his cause died with him. Except in ecclesiastical work, our modern Gothic of any high pretension is now no more; it has done its service, and done it well.

A popular successor to the style of secular Gothic has necessarily been growing up of late years by the mere action of natural law; indeed, such is the leisurely pace of architectural reform, that the new mode has been making its way slowly for more years than may be generally supposed. This is what is somewhat inexpressively and arbitrarily called by the name of the Queen Anne style, as if it were an act of mere revival. But I have suggested to you that it is really a *bric-à-brac* style peculiar to our own day, a minor art style which the influence of South Kensington may claim to have brought about, even if unconsciously. Within its own limits, and directly, no bureaucratic influence can do much in the way of producing a change of public architectural practice; it is a public demand which alone can have that effect. But it was South Kensington, as it seems to me, that created the public demand, now being satisfied by means of an infinitude of charming picturesque detail, chiefly appearing, however, in the design of small works. This is a much more philosophical way of accounting for the change than by attributing it to accident, or to any sort of personal authority. But Mr. Norman Shaw, whose modest and painstaking perseverance of character especially qualifies him, with the help of extraordinary dexterity of draughtsmanship, to be the unambitious agent of an artistic manifestation of this kind, fully deserves the credit of leadership; and he has been followed by a few equally brilliant men who have now unquestionably attained the status of a school, and one whose merits are becoming very considerable.

It is an exceedingly interesting exercise in criticism to inquire what is to be the outcome of this very peculiar movement. That it must gradually lose itself in a return to the universal European Renaissance, may probably be safely asserted. We must bear in mind,—neo-Mediævalist criticism being here altogether unscientific,—that this great historical style, taken in its entirety, although often called Italian as an alternative title, was never such a thing as a merely local Italian, which by accident happened to spread over Europe. It was a Modern European style, which took its rise on the spot where modern Europe had its birth, and at the date when modern Europe was so born. To say that it spread westward until it had overrun the whole European world as a universally accepted mode of building, and that it has been maintained in use ever since, and still is maintained for all ordinary purposes without a question being raised,—except by people who are before the age, or behind it,—is to describe exactly the process by which every great style of design necessarily conquers its allotted territory; and when we in England claim credit with the world, as we do, and are fully entitled to do, for the exceptional merit of having originated and carried to great perfection the Gothic Revival, as a special act of characteristic motive which has now reached a turning-point after having fully satisfied our desires, what is this but a confirmation of the principle by a most unique exception?

If we now proceed to look a little more closely into the future, we have to account for three styles at present in use in England. First, there is the customary style of Modern Europe; secondly, the Revived Gothic, or the style of Mediæval Europe; and thirdly, a certain popular and local mode which I say differs from both, but takes after both, essentially a minor style, and obviously transitional, prompting us already to ask ourselves what is, fourthly, to follow for a personage?

In the first place, let us take the Gothic. Now the Gothic Revival,—which, as I have already said, was a return to the whole artistic system of the grand Mediæval church,—*par excellence* the church of the imagination,—so far as its ecclesiastical purpose extended, has not by any means exhausted itself. Architects of the type of Mr. Butterfield on the one hand, and of Mr. Pearson on the other, have, I think, a long career before them still; that is to say, Gothic churches show no sign of losing their popularity in England yet. But in municipal and domestic work the case is different, and the secular Gothic having culminated in the London Law Courts, has surrendered its claims for ever. But let me put the case in another way. The movement of national sentiment which produced the Gothic Revival, and in its particular form, I observe once more, it was peculiar to England, other nations being mere imitators,—was partly ecclesiastical and partly social. It was the social phase of it which operated in 1834 in the demand that the new Houses of Parliament should be designed in what was called "Gothic or Elizabethan." This was for the sake of archaeology. Up to that date, and long after, when new churches were built in so-called Gothic, this also was net for any reason properly ecclesiastical, but on archaeological ground alone. The ecclesiastical motive, however, was all this time developing itself, chiefly in the universities; and in due course it came before the general public in the rise and progress of a powerful theological party. Now we are not theologians here, but artists; and the way in which we have to look at this very remarkable social phenomenon is, I think, to regard it as inevitable artistic reform, using the term in a very wide sense. It was the introduction of the infinite artistic element, or poetic element, into the English Church, as opposed to a dull and dismal Philistinism which had been in possession of it for many generations. We were to have for the future artistic music, artistic decoration, artistic ceremonial, artistic architecture, and, as I venture to add, artistic doctrine and discipline. This, I may safely affirm, is the harmless way in which the people at large have always looked at the case; and it is especially proved to be so by the circumstance that even the Nonconformists and the Scotch Presbyterians have accepted the new system as far as they could. I need not remind you how earnestly it was embraced by English architects; in fact, we may say that architecture has been almost the helm of the enterpriser, answering to every call with a readiness of

resource for which English genius may justly claim the lasting admiration of the artistic world. It is the ecclesiastical Gothic, therefore, as the style of artistic religion, that I regard to be the only natural or historical form of the Revival. That it has taken a strong hold upon the affections of the people cannot be doubted, and I scarcely care to ask you to fix a period for the duration of its popularity. Like all other manifestations of sentiment, it must in time give way to something new; but let us hope at least that it may be something better rather than worse. Looking again at the influence of the minor arts, it must be borne in mind that, as they stand in practice, they owe almost all their present importance in England to their revivification by means of ecclesiastical architecture; so that, if it should be through the minor arts that the coming style of architecture is to be determined, there seems to be no reason why this should affect our revived ecclesiastical Gothic otherwise than by the continued amelioration of its sometimes too masculine manners, an effect which is not by any means to be discouraged.

As regards, in the next place, the exact position amongst us of the general Modern European mode, from which the French, the Italians, and even the Germans have never swerved, as we have done,—except in mere superficial imitation of ourselves,—I have only to repeat what I have already said, that we cannot help returning to it, and that, indeed, we are already so doing.

Turning now to our third manifestation,—the so-called Queen Anne,—I think one motive which lies at the root of it may be thus described. Secular Gothic had for its principal basis the element of picturesqueness; it was, indeed, frequently designated the picturesque style, as thus distinguished in spirit from the Classic style or style of repose. When, therefore, it was found that municipal buildings and private dwelling-houses designed in this manner, unless all authenticity were expressly sacrificed, proved to be unacceptable to the ordinary feeling of the day, and that, in fact, English common sense, while admiring the picturesque greatly, pronounced against the practical inconvenience of obsolete forms and arrangements, it was necessary to find something to take the place for a time of the rejected style, without surrendering the picturesque character. Mr. Norman Shaw and his colleagues have accomplished this end, as I think, successfully; and it was done by means of the subsidiary art of what I will venture to call *sketchmanship*. The Gothicists had become enthusiastic sketchers; Street was the very prince of sketch-making out of doors; in fact, architectural sketching of the picturesque order was found to be the forte of Englishmen, bringing out in all its force the rough-and-ready national preference for experience for study instead of philosophical. So what was done was to make sketches of a new class of picturesque old buildings, not necessarily pure Gothic, or not even Gothic at all. I am afraid I must say that the specimens selected, with the help of the good-natured name of Queen Anne, whose reign coincided sufficiently well with the use of a kind of Dutch art in England, there was at length brought about a certain popularity for red-brick buildings, with features neither Gothic nor Classic, but quaintly pleasing, and, so to speak, of a sort of Old English type. Nothing could be better suited for such an occasion. The recent development of the minor arts, moreover, was fully recognised; for Dutch art and *bric-à-brac* are never far apart. And so the Queen Anne architects are making very good innings, and just now are doing better and better work daily, although, no doubt, still leaving room for improvement. Some of the drawings of interiors more particularly, which are produced under names unknown to most of us, seem to me to evidence a degree of manual dexterity which ought to tell upon the artistic handling of a higher class of architectural style when the time comes.

What, then, is the higher style to be? I can only suppose, as I have said, that it must be the standard Renaissance in some form or other. We may now ask, therefore, whether England is to insist upon producing any modification of it to suit her own national character; and here a very interesting point comes into view. It is said that, in the history of modern intellectual development, the two races which occupy Europe, the Latin and the Teutonic,

stand in this relation to each other, that the Latins initiate what the Teutons perfect. The more imaginative genius of the French and the Italians, that is to say, having its function in the origination of almost all great discoveries, it is the more practical scientific power of the Germans and English that assumes the task of their development. If this be true with reference to the arts, England in the coming generation may be destined to take the lead of even France; and I for one have no objection to look this possibility fairly in the face. Already the Ecclesiastical Gothic of England in our own day may certainly hold up its head beside anything that France has done; and, perhaps, in the coming Renaissance we may find ourselves no less able to compete with our gifted neighbours. Bright and joyous as the French Renaissance always is, there may be a certain vigour of manliness reserved for the English, which, in an age of increasing manliness and increasing English influence, shall accomplish unexpected results. It is of little use to speculate about the mere details of one academical style or another, and the introduction of this class of features, and the rejection of that, as if personal authority were to govern the course of events; natural law will have its way in this as in all else, and if English intellectual enterprise is to be fairly challenged to accomplish an adaptation of the somewhat hard-worked forms of the Italian-European, I do not see why in the next century an English-European style should not take the lead throughout the world.

Let us further inquire what is the present drift of English architectural sentiment in the abstract. The Mediæval romanticism which a few years ago was the dominant feeling has recently been disappearing with such a strange rapidity that it seems almost doubtful whether the secular Gothic party have not deserted to the enemy in a body. Now, I confess I should be sorry if this were really so; because I think the peculiar artistic enthusiasm which actuated Pugin, Scott, Street, and Burgess, cannot well be dispensed with for some time to come. No doubt a new enthusiasm will spring up; but the Queen Anne movement is not such a thing; it is an impulse of a much more feeble and evanescent character. The attitude which is assumed by the somewhat mysterious organisation of "The Society for the Protection of Ancient Buildings" seems for a moment now and then to be all that is left of the Gothic enthusiasm; but on closer acquaintance this impression is not confirmed. For it declines emphatically to be considered representative of Gothic alone, or, indeed, we may say, of Gothic at all. Its object is not even artistic, but historical; to preserve what is left of the past in the most indiscriminate way; whether good or bad, old or new, preserve it all, so that the reverie of the wayfarer may have not only something authentic, but everything veritable to dwell upon, even when the light of life, perhaps never a very bright light, has quite gone out. This, I need scarcely repeat, is not an enthusiasm of art,—indeed, scarcely one of archaeology; and it has become identified with architecture only because buildings are the most conspicuous relics for such a form of patriotic reverence. I may add, moreover, that the influence of archaeology itself upon architecture seems within the last few years to have given way; and I think this is to be regretted too, inasmuch as our archaeologists, like our old antiquarians the *dilettanti*, if only as matter of prestige, brought the element of learning into prominent connexion with our noble work. The minor art architecture of to-day exhibits again in these respects its conformity with the South Kensington principle, which, in making art a thing of popular skill, and not of academical knowledge, widens the ground that is cultivated, but at the expense necessarily of the depth of cultivation. That our present age is one of superficiality in many other matters besides this, is a well-established fact; and I am not sure that it is to be regretted; for if we can see that the field of art, as actually enjoyable by the multitude of us, is thus being extended so largely, we may well be content to let the learning reappear in its own way and at its own time.

But there is another point to be noticed here, namely the way in which the architectural arts are being controlled and even directed by the artifices of draughtsmanship, or sketchmanship, regarded as a delightful, but delusive, sleight of hand. In the minor arts of decoration, such as glass-painting, carving, painted

ornament, and so on, it is easy to see that clever drawing is in a great measure the essence of the artistic manifestation; but we cannot shut our eyes to the fact that in the now very pleasant work of furniture design, when in the hands of architects, the same clever drawing is fully accepted in the same way; and, as matters go, it is but a step in the style of the moment from furniture to building. Our architecture has thus come to be sketch-designed and sketchy, careless and vague in detail; a thing of scene-painting, picturesque at any price, restless and not necessarily anything else; exceedingly clever on paper, and, when carefully carried out, pretty and piquant in execution, but greatly wanting in the nobler qualities. I do not suppose, however, that this will last long; and, even before the so-called Queen Anne mode itself gives way, we may expect, I hope, to see a more careful manipulation of the modelling becoming universal: indeed, it is already making progress.

Another matter of sentiment to be noted is the abatement of that cynical poeticism which was introduced by Mr. Ruskin. I never could understand why this exquisite dream-painter should have ever taken up such a subject as architecture, except for the indomitable courage of the thing; but there can be no doubt that his visionary doctrines,—and the more visionary necessarily the more vague,—have had a great effect in helping what was weak English art to conquer strong English Philistinism; and, if this involved a certain amount of inconvenient romancing when applied to the practical work of architects, such a result might be expected to appear, and the effect of the medicine must be allowed to wear off by degrees. At all events, now that the artistic spirit has taken possession of us, we need not grudge our thanks to the influence, perhaps upon the public mind more than the professional, of the writings of Ruskin.

But we have, nevertheless, still to face the fact that in high places in England a new Philistinism has been for many years acquiring a certain force,—indeed for thirty years,—an influence antagonistic both to architecture and to architects. The building of the Houses of Parliament in a Gothic style was no sooner fairly under way than the common sense of the more utilitarian order of men connected with the Legislature revolted against it as an anachronism. The architect of the structure, even if he himself had been at first of the same opinion, had, of course, to take all the blame; and, when the edifice came at length to be occupied, there was a cry raised of inconvenience and incongruousness, which has been kept up ever since. In course of time, when the son of the great architect, thinking he had acquired by his father's bequest the position of an hereditary successor, came into collision with Mr. Ayrton, and was ruthlessly defeated by that champion of the Philistines, backed by the unempathetic logic of the courts of law, it would be idle to affect not to see that the pretensions of architects,—the Prime Minister himself had to say they were untenable,—had come to be seriously distrusted. The immediate effect of it was that the Government determined to dispense with outside architects by making use of the officials of the Department of Public Works; and it is still understood that this rule is practically in force for a permanency. The charges made against the profession on this ground are shortly these,—that convenience and economy are sacrificed to monumental appearance, and that the severe character of the commercial contract with a builder is tampered with by the introduction of extras. Upon these questions I need only observe that the most successful architects in England from time immemorial,—I do not say the most artistic,—will be found to have been the most mercantile in their manners; and, secondly, that the artistic element in architecture is not recognised by law, or recognisable in any way by the legal mind. I may also point out that the typical English gentleman,—and typical English legislator,—is a person whose ideas of building are still of primitive simplicity, and that his impression of an architect's business is equally devoid of sentimental considerations. But I do not consider that the so-called unpopularity of architects goes really deeper than this; and if any architect who happens to obtain Government employment,—scarcely ever a desirable thing, by the way,—will condescend to bring his ambition down to the practical level of his private business, and

to do everything in strictly commercial form, there is no reason why he should not give satisfaction.

One word more must be said here upon the influence of competitions. Looking at the eagerness with which these contests are entered upon, the disregard of commercial calculation that is manifested even by the leaders of the profession, and the unseemly bickering that invariably results, how is it to be expected that such men as are at the head of public affairs in a commonwealth of commercial common sense like ours should regard either architecture or architects with due respect? The logical conclusion obviously is that the designs which are so freely offered for nothing must be worth nothing, and that the men who are so ready to work for nothing must be taken at their own valuation. Nevertheless, although I believe it is almost invariably the case that it is not the proprietors that call for a competition for their own sake, but the architects who virtually solicit permission to compete against each other, I am afraid in speculating upon the future of the profession, we must expect this practice of competing to increase rather than diminish. Sooner or later, however, some check must be put upon it, either by the good sense of the public, or by a feeling of shame on the part of the architects themselves; up to the present moment I do not see that any effective steps whatever have been taken towards that end. Still, on the other hand, I cannot but frankly acknowledge the opinion that, without the peculiar artistic exercise and enterprise which competitions induce, English architecture could not possibly have done all it has done during the last half-century. I chiefly object to the great waste the practice occasions, not only in money, but in time, temper, and character.

I may now say a few words,—still keeping to the artistic view of my subject,—upon the position of architects in respect of business. I need not repeat in any way what I have said of the advancing popularity of minor-art architecture, and the increasing competency of our architects to deal with it. But what of the still more rapidly increasing numbers of the men who have to live by it? And what is the state of their organisation?

In the first place, I may express my opinion that the Institute of Architects, established now fifty years ago under circumstances very different from those of the present day, does not display either the vigour or the intelligence which the service of the profession requires, whether we look to the interests of the art or to those of the artists. It is to be hoped that something may be done in that quarter before long; but it must take time: thirty years hence, at any rate, the Institute, we may safely say, ought to be much more earnestly devoted to the practical utilities of art than it is now.

The Royal Academy, also, if architectural art is to retain its connexion with it much longer, must, I venture to suppose, enlarge its views of the minor arts considerably; and here I think we may fortunately expect to see both painters and sculptors entering into the matter with understanding as well as with sincerity.

Turning next to the educational question, we find that examination tests are becoming the order of the day; but whether, in respect of architecture, the introduction of artistic design into the programme can be accomplished, seems still to be matter of doubt. That some kind of academical diploma for art-architectural in its expanding form must, however, sooner or later, be contrived, both to conciliate the artist and to meet a public demand, can scarcely be matter of doubt.

A circumstance that must not be overlooked is the still-increasing employment of professional architects all over the country, which, looking at the sum total, is so far encouraging, even if individual instances of dissatisfaction are numerous. Not many years ago there were but few architects of really good position, except in London and the larger provincial towns. Now the smaller towns, and some that are almost villages, are occupied by practitioners who are frequently quite equal to their metropolitan brethren in skill. The pupils also of provincial men have in some instances better work passing through their hands than those who are in average London offices; and, thanks to a study of the photo-lithographic illustrations of the professional journals, their draughtsmanship is often of quite as high an order as the best in London. All this points to a condition of things in the near future through-

out England in which men architecturally educated are to do a vast amount of good artwork in one way or another, and, therefore, in many ways. Consequently, when I hear the question asked, as I often do, what is to become of the increasing host of young architectural pupils, my answer is that they will be drafted off more and more before long into the service of many charming arts. For there is a certain peculiar characteristic in architectural training,—namely, the habitude of constructional design,—which, even while as yet not so devoid of the old make-believe as we could wish, is still expressly calculated to prepare the mind for that association of the superficial with the substantial which becomes the most essential charm in all formative and ornamental art when once publicly understood, and which the mere counting-house designer acquires, if at all, under great disadvantages.

Another point of importance in our prospect of the next generation of architects is the work connected with so-called engineering construction. Perhaps the most regrettable weakness of English architects at the present time, in point of dignity, is their want of that higher scientific skill which they allow engineers to monopolise. To give a familiar instance, it is quite common for an architect of eminence, when he happens to have ironwork of any magnitude to deal with, to hand it over altogether to an engineer to design, like a solicitor employing counsel to draft a deed. Now this is to be regretted. The reason for the practice obviously is that there is no sufficient current of such work passing through the architect's own hands to keep him up to it, and that he therefore must call in a specialist who does nothing else. It would be useless and, indeed, unfair to reject such an argument; but what I want you to do is to consider what a far superior position the architectural profession would occupy if it were publicly understood that they did all such work for themselves, even if the fact went no further than this,—that the aid came from a specialist architect and not from an engineer. Still, looking at art, what I should like to see is an architecturally-educated man designing such a thing as the most advanced ironwork, and introducing true architectural art into it as his design went on. Otherwise, if one of these two kindred professions has to call in the specialist aid of the other, why should it not be the engineering constructor who calls in the architectural designer? Why should all our building operations of the so-called, and improperly so-called, engineering order,—viaducts, bridges, great roofs, railway stations, piers, embankments, and much more,—be left barren and unfruitful of grace because the designers of them, professing nothing of the artistic spirit themselves, assume that it has no connexion with their work? Here, I would fain hope we may see another sphere of business, and, indeed, one of vast importance and grandeur, opening out in the next generation to the English architect.

To conclude, in answering for yourselves the question what is to be the position of English architecture, let us say, thirty years hence, I invite you simply to regard the profession as one that has been advancing during a corresponding period of the immediate past in a certain direction and at a certain pace which a retrospect of recent history such as I have offered seems to indicate clearly enough, and then to follow forward the same line at an increasing rate of evolution. If the next thirty years should do as much as the last fifty have done, then it becomes easy to understand that the process of development would have to cover as much ground as has been covered since the time of the foundation of our Institute, and the inception of the design of the new Houses of Parliament, in the old-fashioned reign of King William IV. We do not require to imagine the occurrence of any catastrophe; but the change produced upon the face of our art and our profession must undoubtedly be great, and, perhaps may be greater than any argument such as mine suggests. For, during the last fifty years, Dilettantism has gone down before the Romanticism of the Gothic Revival; and this in its turn has at length given place, after adding a very glorious chapter to the history of the art. The old Philistinism of the Georges has been vanquished by the South Kensington movement, as a movement of the people; and a new Philistinism has arisen, which has to be vanquished, and will be, in due time.

The empty conventional formulas of the academical arts have been vigorously assailed by the new non-academical substantial facts, and the minor arts are already so far triumphant before the common sense of England that architecture itself has taken service in their cause, and a great deal for the better if a little for the worse. In these campaigns the whole lives of such great men as Pugin and Barry, Scott and Street, have been expended, and the task of great writers like Ruskin and Ferguson exhausted. Cole has passed through his long and busy, masterly and masterful career. The genial influence of Prince Albert, infinitely beneficial to the artistic sentiment, has already survived his own august life for three-and-twenty years. This artistic sentiment has for the first time spread all over our country, one of the kindest graces of the splendid Victorian age; and England is now ready to enter upon a new chapter of her magnificent history, not, let us hope, with arms in her hands, whether for conquest or defence, but with the fruits of science and the flowers of art. And possibly,—indeed, I venture to think not improbably,—it may be the destiny of England at a period by no means remote, in the development of the advancing scheme of Anglo-Saxon civilisation, to assume a leadership,—such as she already possesses in so much besides,—in the illustrious art which it is the pride and the joy of this assembly to represent.

The discussion which followed the reading of this paper will be found on page 713.

VISIT TO THE BROMPTON ORATORY.

On Thursday, the 8th inst., the members and their guests, at 11 a.m., visited the new Oratory at Brompton, where they were received in the nave by Mr. Herbert A. Gribble, the architect of the building, who, after a few preliminary words of welcome, proceeded to conduct the visitors round the nine chapels, commencing with the first one on the north side, being that of St. Patrick. Our readers will remember that the Oratory was visited by the members of the Architectural Association on March 8th last, and it is evident a considerable amount of progress has been made here during the last two months. The Oratory has been opened in the interval for divine service, and the decorations are now in a very advanced state. Mr. Gribble stated that the altar in St. Patrick's Chapel has been executed in Sienna, Sicilian, and other marbles, by Mr. George Mitchell, of Brompton-road, for the sum of 2944.; it was commenced and completed in the short space of seven weeks. In the next chapel, that of St. Mary Magdalen, Mr. Gribble said the altar had cost 1,100l. The mosaic panels are now completed on the walls, and certainly have a beautiful effect. Passing through the Calvary Chapel (under the organ chamber), the members reached the Lady Chapel, where was pointed out the beautiful altar from Brescia, in Italy, which Mr. Gribble stated had been purchased for a mere song, but, upon which, including the purchase, cost of conveyance to England, and restoration, the total outlay had been 4,000l.

VISIT TO THE CENTRAL TECHNICAL COLLEGE.

A LITTLE later the members inspected the new Central Technical College, South Kensington. Here it was explained that the architect, Mr. Alfred Waterhouse, A.R.A., was on the Continent, but Mr. Cooper (from the office of the architect), Mr. Lovatt, jun., the contractor, and Mr. T. Streeter (clerk of the works) conducted the visitors over the building and explained the working drawings and general arrangements. The college has been erected by the City and Guilds of London Technical Institution at a cost of about 75,000l. Since the foundation-stone was laid by H.R.H. the Prince of Wales, July 18th, 1881, the building has rapidly progressed, and now only awaits the necessary fittings to be ready for the commencement of the work for which it was erected. The building has a principal frontage of 295 ft. on the west side of the Exhibition-road, its extreme depth being 140 ft. It is a building of five stories, and is throughout of fireproof construction. The façade towards the Exhibition-road has a central pavilion of an extreme height of 113 ft. above the footway, and two end gabled pavilions of 95 ft. high each. The facings throughout the buildings are of Suffolk red bricks with red

terra-cotta dressings, the latter being supplied by Messrs. Gibbs & Canning, of Tamworth. On the front are the coats of arms of twenty of the principal manufacturing towns of Great Britain and also the Royal and Civic arms, and those of the principal guilds, the whole of which were modelled by Mr. James Gamble, of South Kensington. In the centre gable is fixed a clock; above are three bells, on which the hours and quarters are struck, the whole being supplied by Messrs. Gillett & Co., of Croydon; the face of the clock, which is 8 ft. 6 in. diameter, is of glass mosaic, and was executed, as was also the whole of the mosaic in corridors and hall, by Messrs. Burke & Co., of Newman-street. In the basement are rooms with isolated brick piers for delicate balance experiments, constructed on foundations which go 16 ft. deep in the ground. Here are also four large rooms for mechanical workshops, together with metallurgical laboratory, engine-room, and boiler-room, and a large top-lighted workshop, about 85 ft. by 60 ft. The two boilers, which are of Siemens's steel, were constructed specially for the building by Messrs. Galloway, of Manchester, and are of sufficient power to furnish steam for the motive power required for the machinery and for the heating apparatus. At the north end are the water-closets and urinals. On this floor also are a large lavatory for students, and two rooms which will be fitted with lockers; also twenty-eight coal and storage vaults. On the ground-floor in the centre is a spacious hall with a groined ceiling supported on granite and falence columns, to the left of which are class-rooms for Physics and Mathematics; and on the right those for the Engineering department. At the back are two galleried theatres, respectively 50 ft. by 35 ft. and 50 ft. by 31 ft., to each of which is attached a preparation-room. There are also spacious lavatories on this floor. On the first-floor are the offices, directors' room, and council-room, in the latter of which the arms of the seventy-six guilds will be placed. In the centre, over the entrance, is the library, and to the south are four large class-rooms for the Physics department. The second floor is arranged for class-rooms for Chemistry and Art, and over the lecture-theatres are two chemical laboratories. On the third floor are the principal chemical laboratory, 74 ft. by 34 ft.; a museum, 70 ft. by 35 ft.; a large class-room, chemical store-rooms, refreshment-room, kitchen, and caretaker's apartments. Above part of the northern wing is a large asphalted flat. Access is obtained to the various floors by means of three staircases, the centre or principal one having a wide central flight and two return flights. The whole of the piers and balustrade in hall are of Messrs. Wilcock & Co.'s Burmanotte faience, of a rich yellow colour. All the steps have been supplied by Messrs. Stuart, and are of their granolithic concrete; the same firm have also laid the basement and second and third floor corridors with that material. A steam lift is provided in the northern wing. The heating and ventilating arrangements are being carried out by Messrs. Bacon & Co., the warm air being conveyed into the rooms by special inlets, the outlets being the ordinary fireplace openings, where (instead of stoves) ornamental iron grilles are inserted. All the walls are finished in plain tints with "Dureco," the work having been executed for Messrs. Lovatt by Mr. Howe, of Wigmore-street and Forest-hill. As stated, the architect for the building is Mr. Alfred Waterhouse, A.R.A. Messrs. Munday & Sons were the contractors for the foundations, and Messrs. Henry Lovatt & Son, of Wolverhampton, are the contractors for the whole of the superstructure. Mr. T. Streeter has acted as clerk of the works, and Mr. Roberts as builder's foreman. A large illustration of the front elevation, with a ground plan and some additional particulars, will be found in the *Builder* for January 5th last. This and the preceding visit were made under the charge of Mr. Cole A. Adams and Mr. G. Richards Julian. The whole party then proceeded under the guidance of Mr. T. W. Cutler and Mr. Cole A. Adams to Stafford House.

VISITS TO WEST END MANSIONS.

STAFFORD HOUSE.

THE members and visitors assembled here at two p.m., and were admitted by special tickets, by permission of his Grace the Duke of Sutherland, K.G. Stafford House, at one time called York House, is, as many of our readers are aware, in the immediate vicinity of St. James's Palace, and between it and the Green Park. It was erected, all but the upper story, for the late Duke of York, with money advanced for the purpose by the Marquis of Stafford, afterwards the first Duke of Sutherland. The Duke of York never resided in it, having died before its completion. The Crown lease was sold to the Duke of Sutherland, July 6th, 1841, for the sum of 72,000*l.* The upper story was added afterwards. Peter Cunningham says, "This is said to be the finest private mansion in the metropolis. Nothing can compete with it in size, taste, or decoration. The great dining-room is worthy of Versailles." The land on which Stafford House stands belongs to the Crown, and the duke pays an annual ground-rent of 75*l.* It stands partly on the site of Godolphin House, and partly on the site of the Queen's Library,—the one built by the queen of George II. At least 250,000*l.* has been expended on Stafford House. It was erected from the designs of Messrs. Wyatt, architects. Printed copies of the Messrs. Wyatt's plans, as also those of Mr. (afterwards Sir Robert) Smirke for the same building, were exhibited to the visitors. The internal arrangements were designed by Sir Charles Barry, R.A. The Sutherland Gallery, as it is called, is a noble room, 126 ft. long by 32 ft. wide. The pictures are very fine, and the collection of objects of art distributed throughout the house includes a large marble relief portrait of Garibaldi, erected since his visit to Stafford House. For a catalogue of the principal paintings we must refer our readers to Peter Cunningham's "Handbook of London."

SIR WILFRID LAWSON'S HOUSE.

At three p.m. the members walked across the Green Park, passing the colossal statue of the late Duke of Wellington (shored up pending its removal from London), thence to No. 1 Grosvenor-crescent, Belgrave-square, which they visited by permission of its owner, Sir Wilfrid Lawson, bart., M.P. This house was erected about the year 1827, from designs by Mr. George Basevi, who also designed the whole of Belgrave-square in 1825. The drawing-room, dining-room, and staircase of this house have been recently decorated by Mr. George Aitchison, A.R.A., architect, and were inspected by the visitors. The walls of the drawing-room are covered with a rich golden silk, and in the centre of the ceiling is a very large centre flower, gilded to correspond with the walls. The ornamental balusters to the staircase are silvered, and present a somewhat subdued appearance.

LORD LECONFIELD'S HOUSE.

The members and visitors were received here at four p.m. by Mr. George Aitchison, A.R.A., under whose superintendence the house is being completed and decorated. The house is situated at No. 9, Chesterfield Gardens, Mayfair, and was originally designed by Mr. Salvin, and erected in 1877 under the superintendence of Mr. T. H. Wyatt. Mr. Aitchison explained to the visitors what is being done.

MR. J. STEWART HODGSON'S HOUSE.

Mr. G. Aitchison next conducted the visitors to this house, No. 1, South Audley-street, where some beautiful wainscoting and other carved oak work, designed by himself, has been completed. This house was erected from designs by the late Mr. F. P. Cockerell, architect.

CONVERSAZIONE AT THE SOUTH KENSINGTON MUSEUM.

THURSDAY'S proceedings were brought to a close by a *conversazione* of the members and guests held by permission of the Lords of the

Committee of Council on Education at the South Kensington Museum.

The President (Mr. Ewan Christian) and Council received the members and guests at nine p.m., and the company, which included a great number of ladies, promenaded the different courts and art galleries till midnight, inspecting the various objects of art and antiquity exhibited there.

During the evening a programme of music was performed by the band of the Royal Engineers, under the direction of Herr J. R. Sawerthal, Bandmaster, R.E.

VISIT TO MESSRS. W. CUBITT'S WORKSHOPS.

On Friday, May 9th, at three p.m. a visit was made to the workshops of the well-known firm of Messrs. William Cubitt & Co., 253, Gray's Inn-road, by permission of the firm. The visitors were received by Mr. Kean, engineer to the firm; Mr. Paul, chief of the carpenters' and joiners' department; Mr. Smith, foreman of masons; and Mr. Baldwin, foreman of plasterers, who severally conducted them through their separate departments, commencing with the carpenters' and joiners' workshops. Here much interest was evinced in the various kinds of joinery work which was in progress. The museum of specimen woods was next inspected. Here are hung polished specimens of many beautiful English and foreign woods, including rare samples from America and Australia. Returning to the joiners' department, the machinery, which was in full operation, was inspected, an ingenious machine for cutting flutes, circular mouldings, and other details used in Gothic and Renaissance work attracting much attention. All the tools used are of the best solid steel. We understand the name of this machine to be "Thompson's Universal Joiner." The parquetry work and the polishing operations were next inspected. The machine for moulding circular work was shown in operation, pieces for circular architraves or archivoltas being quickly moulded on the edges by pressing the wood round on a flat table against the cutter. The turning-room was next entered, where spiral or twisted balusters and newels were being turned on the lathes. The dowelled doors, as made for the Peabody dwellings by this firm, also attracted notice, the holes being drilled in the framing, and oak dowels inserted as a fixing instead of tenons, thus pinning the frame together. A method of laying floors without the nails being visible, and a band-saw by which patterns in fret-work can be cut in any direction, were also noticed. The smith's shop was next visited, and here "shearing" and "punching" are done by the same machine. The marble and stonework shops were next inspected. Here are to be seen large rubbing-tables, for producing plane surfaces on stone, and also moulding, turning, and polishing machines. The engineers' and ironfounders' workshops, and the wrought-iron shops, where the hammered work is done, were next inspected, and much interest was manifested when the show-room was reached, showing the results of the labour performed in these shops, in the form of stoves, ranges, hot-water fittings, &c. The firm manufacture their own bricks, tiles, cement, and terra-cotta. In the manufacture of terra-cotta broken glass and crockery are used, by being pulverised beneath powerful grinding-wheels. The modelling and show rooms attached to this department exhibit specimens of the potters' and decorators' art. At the conclusion of the visit a vote of thanks, proposed by Mr. Cole A. Adams, was unanimously accorded to the firm, and to the heads of departments, for the kindness and courtesy that had been shown to the visitors.*

* A more detailed description of the works of this celebrated firm was given in the *Builder* more than eight years ago, on the occasion of a visit by the members of the Architectural Association (See *Builder* for March 4, 1876).

The Builder.

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The Gallery of Antique Sculpture, Cambridge.



SIXTY years ago the University of Bonn formed its Museum of Casts from ancient sculpture for the use of students of classical archaeology. Cambridge has at last followed this example, and no archaeologist will tax her with any undue forwardness in the matter. Indeed, some of us will think that the opening festival held on the 6th of May might well have been preceded by a day of solemn fasting and humiliation for obvious duty long neglected. Still, strange though our inertia may seem in German eyes, and far behind as Germany has left us in the race, Cambridge is first in England, and all her sons and daughters are justly proud. She is only just in time to grasp these belated laurels. The Museum at South Kensington, though not yet open to the public, is well advanced, and, as Mr. Newton wittily said, even Oxford, hard beset, cannot much longer continue to

"dally with her golden chain,
And, smiling, put the question by."

The need seems so pressing, so obvious, that it is somewhat hard to see why, long ago, it was not supplied. As was said by more than one speaker at the opening, a museum of casts is as necessary to the teacher of archaeology as a chemical laboratory to the teacher of chemistry. Indeed, thus much Cambridge was not slow to recognise. As soon as she decided that the subject should be taught she was sufficiently logical to provide the proper means of teaching. Where her conviction tarried was as to the fitness of the subject. Was this subject of Greek art, or was it not, anything more than a sort of elegant trifling, a graceful topic for amateur leisure, but beneath the dignity of the serious student? Could it or could it not be made the object of precise and systematic teaching? This was the doubt that lurked in the mind of Cambridge, and, though unconfessed, paralysed her action. It would be an ill day, she felt, when her classical undergraduates ceased to sharpen their wits on the whetstone of grammatical niceties, and sought to cover their ignorance by the jargon of art terminology. It was a natural, and perhaps a just suspicion, and it behoves the friends of archaeology to look

well to their work that they in no way justify it. There is a danger, and it can only be neutralised by facing it boldly. In archaeology there is an opening for slipshod work, arising from that very mixture of the scientific and literary elements which makes the study so fascinating. In the teaching of classical language Cambridge has, in the course of centuries, matured a system so fine, so finished, that it affords a mental training which is, we are bold to say, unrivalled. It is still an open question whether, as a means of training, the subject of archaeology can be developed in like manner; if it can Cambridge will do it, if it cannot we are sure,—nay, more, we hope,—that archaeology, as a subject for university teaching, will not persist. At this very moment the examiners are at work settling the first papers of the new archaeological branch of the tripos, and those papers begin the test.

We have said that England is late in the field, but even the late comer has advantages,—he profits by the experience of bolder pioneers. Coming fresh from the magnificent Cast Museum at Berlin, the largest and far the most complete in the world, and which has grown by the accretions of years, we were conscious that, on its smaller scale, and at least for beginners, the Cambridge Museum was the better place for study. Every cast museum must to a certain extent be a compromise between ideal arrangement on the one hand, and the exigencies of space on the other; but at Berlin constant new acquisitions have pushed this compromise to a point that is perplexing to the unaccustomed eye. In the large Archaic room at Berlin are gathered together from sheer want of space representations of schools and periods the most diverse. Assyrian and Phœnician sculptures look down on the recently-discovered frieze of Djölbaschi, the Amazons of Scopus confront the rude, grinning Medusa from Selinus. This is rather pleasant than otherwise to the expert, but the eye of the novice is unduly troubled. At Cambridge, classification, beginning when material was far more copious, has had full and easy scope. In the matter of mere chronology he who runs may read. As we enter the door we are at Delos, and the first cast that meets our eye is the earliest bit of Greek sculptural art we possess, a copy in stone probably of some old temple xoanon or sacred wooden image, an almost shapeless woman figure. This lady of stone had hard measure dealt out to her by many of the speakers; in turn they took up their parable about her; she was a "mere fetich," a "rude idol," a "formless block." They had all seen her as they passed, and each had his stone ready to throw at her; it was wonderful, one speaker said, that from this rude inarticulate beginning should develop all the vital speak-

ing wonders of advanced Greek art,—all the Apollos, the Aphrodites, and the rest of the Olympian throng. It was wonderful, and to some of us it is infinitely sad and pitiable, that a beginning so simple, so earnest, so right as the Delos figure should end in the decadence of Græco-Roman art, so dissolute in its complex laxity. We wondered how many of the speakers had paused as they went in and read on the robe of this Delos figure the story of her making,—"Nikandre dedicated me to the Far-darter, the archer goddess." This early stone statue does not appear in our plates, but we have spoken of her advisedly, not because she has been so recently discovered, nor because of the great interest of her inscription to epigraphists, but because she strikes the keynote of all the subsequent utterances of Greek art; she was an "Agalma," a sacred offering, a thing beautiful in the eyes of the gods. Greek art had its basis in religion, and ceased to flourish when it ceased to be religious. Art took its rise from Greece, not as in Egypt, in the desire for realistic portraiture of the mortal, but in the longing to portray in human form the deathless gods. It learned, no doubt, from other nations much of technique that was common to all; it even, no doubt, imbibed something of the naturalism of Egypt, something of the symbolic phantastic manner of Chaldaeo-Assyria, but what was peculiar, intrinsic, unique in Greek art was its faculty of idealisation, of producing that which is according to, yet beyond, nature,—what never has been, yet always might be. Where art takes its rise in religion realism is impossible. It is an obvious impiety. Two courses remain: either the artist must utter his mind in symbolism, must create fantastic, unnatural forms which mean much which are nothing, which form a mere complex of attributes with no substantive existence, such as the Cherubim of the Chaldaeo-Assyrian (this course the Greek artist rejected, his love of beauty, his naturalness, held him back); or the artist must idealise, must think his gods in human form, must take refuge in human shapedness, in anthropomorphism. It is the peculiar merit of the Greeks that they fearlessly adopted this course. We are so used to this method of idealisation now that we scarcely realise its full significance, or of what tremendous issue were its first beginnings. Those first beginnings were made when, from the worship of a board, a post, a stone,—such fetich objects as Eastern nations delighted to honour to the end, the Greek turned to worship such gods as the stone Artemis at the Cambridge doorway, simple of form indeed, but no fetich, a human goddess near akin to the Olympian Zeus himself. In the first gallery, which leads up to the room figured in Plate iii,

we have representations of all the various phases of archaic art. We have the heavy draped Ionian style of a certain soft luxurious quality, well seen in the Samos Hera and the analogous Branchidae statues. We can see at a glance how the island schools of the Ægean were the stepping-stones by which certain methods of art passed from Asia Minor to Greece proper. We can study in the metopes of Selinus how the fearless naturalism (verging on the grotesque) of the West contrasts with the careful, studied conventionalism of Asia Minor. We can watch in the so-called "Apollon" of Orchomenos and Thera the rise of a school whose special object was the study of the nude, athlete form, and which, though its ultimate origin is still obscure, we are accustomed to call Peloponnesian. Or, turning from the technique which expresses to the thought which is expressed, we can see how three tendencies were ever at work among the Greeks, all of which issued in idealism; how, as we have noted, they made the images of their gods in human form; how, in their statues of athlete figures, they by degrees so perfected this human form that it became the fitting habitation and embodiment of their conception of the gods; and how, midway between God and mortal, there stood the figure of the hero,—half divine, half human,—the artistic link between heaven and earth. These three tendencies, anthropomorphism, the cult of heroes, and the striving after perfection of physical form, work together through the art of the archaic and transitional period to culminate ultimately in the idealism of Pheidias.

But we are anticipating a little, and a glance at our first view checks our too rapid advance. Through the columns in the distance, about the centre of the picture, we see the figure of Apollo with the right-arm outstretched. On his left-hand, but only appearing dimly in our plate, is a group of a Centaur struggling with a Lapith woman; to the left side of our plate, a crouching slave appears. All these are fragments of the western pediment of the temple of Zeus at Olympia in which was sculptured the great battle of the Centaurs and Greeks at the marriage-feast of Peirithoos. Apollo in the centre of the pediment appears to stay the strife and save his Greeks from their monster foes. The eastern corresponding pediment was sculptured by Pæonios, and represented the contest between Pelops and Enomaus, a local myth connected with Olympian cults. Fully to study these pediments as compositions and to see the place they take in the development of Greek art, we must see them, or, rather, casts of them, in the Olympian Museum at Berlin, where each several figure is either already restored or about to be restored and raised to at least something like its approximate architectural height: where, further, casts in miniature of the two pediments, east and west, with their full architectural surroundings, are placed side by side, and the striking contrast between the styles of Pæonios and Alkamenes springs at once to light. From Berlin we should naturally expect that on the vexed question of these Olympian sculptures should issue some "clear disposing word," and, indeed, the last view expressed (*Arch. Zeit.*, 1883, p. 359) by Prof. Curtius is full of suggestion. For beauty of composition, for ideality of expression in the several figures, he unhesitatingly gives, as antiquity probably did, the palm to Pæonios; but he sees in the two pediments respectively two conflicting tendencies, each characteristic of archaic art,—in the pediment of Pæonios the tendency to severe and excessive symmetry, to a rigid architectural structure in composition; in that of Alkamenes a too great naturalism, an over-wrought vitality showing itself in action unduly strained. These two conflicting tendencies could fuse and mingle only in the fire of a genius such as Pheidias. The art of Pheidias we shall always reserve as the object of final contemplation; but if we wish to see the processes by which perfection was attained, we must watch this Olympian period of struggle and transition.

In the recess on the right-hand side of the plate stands the severe, simple figure known as Hestia Giustiniani of the Torlonia collection.

From certain other analogous figures we may safely take her as a type of the Peloponnesian school, a school whose traditions were tinged with a certain precision of theory, a certain mathematical correctness, that culminated in the well-known canons of Polycleitos and Lysippos. The drapery of this Giustiniani Hestia is of an austerity verging on hardness, very far removed from the richness, the complication, the variety and flow of line which even early Ionic work shows. It was the mission of the Peloponnesian school to perfect rather the nude form of the athlete.

Far in the distance of our front view, a step beyond the Olympian sculptures, the horsemen of the Parthenon frieze come first into sight, to remind us of the perfect Pheidian period, when all these struggles of thought and technique ended in the peace of absolute accomplishment. But perfection never tarries long. It was the special mission of Pheidias to embody the highest conceptions of the chief among the gods in the most perfect form; by the faculty of ideality he eliminated all that was trifling, all unnecessary detail, all that was disturbing, all the petty tumult of the passing hour. But our next view (plate iii.) lands us in a region which, if still ideal, is at best a lower Olympus. We have left Pheidias and descended to Praxiteles. His one certain genuine work, the Hermes with the child Dionysos rightly dominates the room, standing in the recess at the end, and clearly visible from the first moment we enter the museum. In our view it is hazy and dim in the distance. All our conceptions of Praxiteles must, of course, be referred to this statue as the standard, little famous though it was in antiquity, and possibly ranking, as Prof. Brunn conjectures it did, among the early, immature works of the master. The group round this Hermes is instructive. On his right hand is one of the many supposed replicas of the famous Sauroctonos, Apollo killing the lizard; on the left is the Munich Aphrodite, an echo of the motive of the statue made by Praxiteles for the Cnidians. But of this statue there are many echoes. Why not choose the clearest? There is a statue in the Vatican analogous in pose to the Aphrodite, but of far finer work, draped by a prudish Pope in tinfoil garments,—this one it is that comes the nearest of all copies to something of Praxitelean charm. On either side of the Apollo and the Aphrodite come two statues of Hermes, instructive for comparison with the centre original. It is only when these replicas of Praxitelean types are gathered together that we realise how wide the gulf between Pheidias and Praxiteles,—how about the elder is the atmosphere of gracious calm, a peace of the upper air, while about the younger there is charm indeed, but also pathos and unrest. Leaving this definitely Praxitelean group, we find to the right a youth who has just of late much exercised the minds of archaeologists,—a Dionysos wearing a fawn skin; looking at him closely we should be struck by the wonderful, effeminate beauty of the god's carefully-ordered hair. But the style, the feeling of the work is puzzling; some see in his pose a touch of Polycleitos, others much of the soft manner of Praxiteles. Perhaps the clue lies in this very difference of opinion. The statue,—charming though it is—(and, indeed, to our mind it is more pleasing than the noted Hermes), still fails to satisfy the practised eye as belonging to any known, well-defined school; the inference may be that it is an eclectic work of later days, though it has none of the condensed self-conscious restraint that characterises, for example, the school of Pasiteles.

But we must pass on. Next to the problematic Dionysos is the now well-known sculptured drum from Ephesos, of date approximating that of Scopas. Next to the column our own seated Demeter of Cnidus, which reminds us that, though England has lagged behind in the study of archaeology, one Englishman at least stands in the forefront of discoverers. Last, the Munich group, Eirene, with the child Ploutos in her arms, a group unnoticed at Munich till Prof. Brunn, in his brilliant fashion of re-discovery, saw in it a copy of the bronze by Kephisodotos,

father of Praxiteles, the ancestor of what he has himself humorously called the "nursery-maid motive." We cannot pass unnoticed the "Praying Boy," who stands with arms uplifted in the centre of the room, more especially as his fame is likely to decline before the bronze athlete from Salamis recently acquired from the Sabouroff Collection for the Berlin Museum. The two will ill bear juxtaposition.

From this varied Praxitelean world it is no harsh transition to our next view. Two Venus types closely analogous stand opposite each other; the Apollo Belvedere and the Artemis of Versailles show their familiar faces in the distance. Showy and unsatisfactory they are, but for the sake of old times, when some of us knew no better, and loved them, let us look at them tenderly: they are deities discredited, dead loves, and *de mortuis nil*, &c. We end to-day where we used to begin; we blame what we used to praise, and we are right and safe, for the historical method has given us a true abiding standard; only let us beware that our change of attitude be really taste the permanent, not fashion the fluctuating.

If we began with doubts about the merits and particular virtue of archaeological studies, our doubts give way in the presence of so much collective beauty. If any one finds casts dispiriting because they are not originals, he is a Sybarite in art with jaded sensibilities hard to stir; for us we feel that it is good for us to have been there, we cherish the old forlorn, deluded hope that some effluence goes forth from beauty to those that behold her, and that to generation after generation of undergraduates this Cast Museum will be to each, according to his kind, a palace of delight, an influence for hope, for aspiration, or for peace.

The building, with the sculptures and fittings, has cost about 12,000*l*. There has been lately in the air a pestilent theory, or perhaps rather a floating hope and desire of the uneducated and ill-educated, that ancient art and literature might "conveniently and economically be neglected together." Cambridge has made a solid and substantial protest against this heresy. But that this protest was made, that it took a form so necessary, so objective, so permanent, was, we are bound to remember, mainly due to the energy, the patience, the insight of one scholar. In his opening speech, the Slade Professor of Fine Arts said that Cambridge had been to him a kind nurse and mother; and Cambridge in her turn will write against his name, in grateful tribute to a great work done,—

Θραήρη ἀντίδωκε τῆς ἰμῆς τροφῆς.

BUILDING CONSTRUCTION.*

THIS is an age of examinations. An increasing tendency is shown to insist that all who profess a knowledge of any art or science shall give some proof of having gone through a course of study in the same before being allowed to practise. Whatever opinion may be held upon the real value of these examinations, there can be no doubt that their institution has led to the production of a number of most excellent text-books for students. In law, in medicine, and in architecture, as well as in those subjects comprised in the ordinary school curriculum, the facilities for acquiring knowledge are infinitely greater than they were twenty years ago. We are not denying the existence of the materials for acquiring the knowledge, and we have little doubt that the enterprising student who would work carefully through the larger treatises on his special subject and make himself master of them would turn out a better man than the one who simply consults at second-hand the "maestri di color chi sanno." But apart from the mere money cost of large works on technical subjects, and the time necessary for mastering their contents, the student was met by one great initial difficulty which frequently disheartened him at

* Notes on Building Construction. Arranged to meet the requirements of the Syllabus of the Science and Art Department of the Committee of Council on Education, South Kensington, Part II. Commencement of Second Stage or Advanced Course, Second edition. London: Rivingtons, 1884.

the outset. This was that he was unable to find anywhere clear explanations of elementary matters. The merest smattering of knowledge used to be considered sufficient to enable its possessor to write an elementary hand-book, whereas the fullest knowledge and the widest practical experience are really required for the full elucidation of the rudiments of any subject. This is quite as true in regard to architecture as to everything else, particularly on its practical or scientific side, and we welcome Messrs. Rivingtons' series of "Notes on Building Construction" all the more warmly from the keen recollection of a student's difficulties in acquiring a sound knowledge of structural principles and details, the lack of which often heavily handicaps a man in after-life. Nothing is more likely to lead to scamped work in a building than for the workmen to find out that the architect does not know whether, for instance, the brickwork of the walls is properly bonded, or whether the joinery is framed in the right way or the wrong; and if the work is scamped the defects will, sooner or later, make themselves apparent to the discomfort of the occupier, who will begin to question the advantage of employing an architect at all. No amount of knowledge obtained from books alone will suffice without actual observation of the various operations carried on in building; but clear explanations and good illustrations will be of material assistance.

Part II. of this series of Notes is in continuation of Part I., and describes and explains more complicated details of construction. Compound walls are described, and the evils attending the construction of the inside casing of a wall of different materials from the outside are fully noted, and some very practical remarks are made upon the exclusion of damp from walls. The necessity of horizontal damp-proof courses is fully insisted upon, but nothing is said as to the great efficacy of a vertical damp course in basement walls; this can be easily and cheaply arranged by building the wall below the ground level with a cavity of about three quarters of an inch, and filling in with boiling asphalt, the top of the cavity being at the level of the horizontal damp course. The remarks on hollow walls are very good, but we should have been glad to see an illustration of a window or door opening in a hollow wall, as it is in these positions that the treatment of such walls offers the chief difficulties to students. We wish the author had expressed in a more thorough manner his disapproval of the system of tuck-pointing. He says simply that by it "badly-executed work is disguised and made to present a good appearance." This is, however, of the most ephemeral nature, and we know of nothing much worse than the appearance after a year or two's wear of a brick wall tuck-pointed in the approved modern fashion, with the vertical joints ruled with a straight-edge one above another without the slightest care whether they coincide or not with the real joints of the brickwork. The explanations of the various kinds of irregular bond in brickwork are good and the diagrams clear; and an excellent and full description, with illustrations, is given of the way of arranging flues and chimney-stacks with their bond.

In carpentry we find queen-post roofs fully treated, the king-post roof having been described in Part I., and a good illustration of what is too often dispensed with, viz., the angle brace and dragon beam to support the hip-rafter at the angle of a building. The chapter on built-up beams and strengthening timber girders might, we think, have been omitted, as these have been almost entirely superseded by iron girders; and, moreover, we can find no mention of them in the Syllabus of the Science and Art Department, upon which the arrangement of these "Notes" has been based. The chapter on roof-coverings is good, but it might have been made more complete by a description of some of the modern kinds of tiles that have been lately brought into the market, such as Phillips's patent lock-jaw roofing tiles. Taylor's patent is the only one that is mentioned.

Nothing in building construction offers more

difficulties to the architectural student than joiners' work. He will doubtless frequently have to trace sheets of details prepared by one of the senior assistants in the office, but unless he gets a careful explanation of their meaning, they will be utterly unintelligible to him; and many a man at the expiration of his articles would be completely puzzled if he were asked to draw a full-sized detail of a sash-window, with inside boxed shutters. In the book under notice, the section on joinery is well done; the different kinds of joints are explained, the purpose of grounds and linings is described, and the best way of fixing them, and the intricacies of folding and sliding shutters are made clear by some carefully-drawn illustrations. Skylights and lanterns are described, and a full account is given of the proper way of making and fixing of staircases, and excellent directions are given for planning them in different positions, and for constructing winders, &c. We notice, however, a remark concerning skirtings which is decidedly misleading. If there is one thing more than another indicative of scamped and careless work, it is the practice of leaving the space behind the skirting of a room unplastered. Not only does the hollow harbour vermin, as the author admits, but it is the cause of both sounds and smells passing from one room to another: and an architect should not only describe in his specification that the plaster is to be carried down behind the skirtings to the floor-level, but should always see with his own eyes that this has been done. The author does not appear to see any very great necessity for this, as he simply observes "the plastering is sometimes continued down to the floor to fill it [the hollow behind the skirting] up." We should strongly advise him to add these words in his next edition: "and this should invariably be done."

In ironwork the different parts of roof trusses are described, and the best means of connecting them together and of attaching the trusses to iron columns is shown as clearly as can be done by untinted illustrations. The necessity of providing for the expansion and contraction of iron roofs is not lost sight of, and various methods of attaining this object are shown. There is an instructive chapter on riveting and riveted joints, giving all the information likely to be required by a student; and this is followed by a good account of various kinds of fire-proof flooring, including several French systems. This is a subject which has scarcely received the attention in this country which its importance demands. The value of land in London and in nearly all our large cities has increased so enormously that there is a growing tendency towards the erection of huge piles of buildings such as are to be seen in the American cities. But there no expense is spared to render the whole building perfectly fireproof, while in this country it is too often done in a half-hearted manner from motives of economy, with the result that in case of fire the building turns out not to be fireproof at all. We should have been glad if the author had been able to include a description of some of the American systems, such as P. B. Wight's system of Chicago, the Clinton Wire Cloth system, and others.

Plasterer's work is fully and accurately described, and useful information is given as to painting and glazing; but there is a remarkable varnishing, with which we certainly cannot agree. The author says "the surface of woodwork should be treated with size before being varnished to prevent it from swelling; this also fills up the pores and causes a saving in the quantity of varnish used." Now, the effect of size,—and we assume glue size is meant,—is to form a thin glaze on the surface of the wood, so that the varnish adheres to this glaze alone, and does not become incorporated with the wood. No doubt a saving in the amount of varnish is effected, and at first the appearance is as good as if double the amount of varnish had been used, but the least shrinkage in the wood causes the varnish to crack, and, for lasting work, glue size should never be used. The best method of treating woodwork is first to apply a coat of gold size, which is a species of thin varnish that fills up

the pores of the wood, and then to follow with two coats of varnish, washing the work down with clean cold water between the application of the two coats. Thus treated varnished work will last three times as long as if sized and varnished in the ordinary way. Paper must be treated quite differently, and here the use of glue size is a necessity.

The work concludes with a chapter on shoring and scaffolding, and one on foundations. In the former the modern plan of using a derrick-crane for hoisting materials is mentioned, but it is not stated, what we believe to be a fact, that in the case of a building of any size, the cost of hoisting materials in this way is about half that of any other. With reference to foundations, the cream of the information to be obtained from larger works is given, but on this subject nothing but practical experience will be of much avail to the young architect.

On the whole, these "Notes" are thoroughly well done; we should ourselves have been rather disposed to let Part III., which treats of the nature of building materials, precede Part II., which treats of the details of their application, but the whole series will prove of the greatest possible assistance, not only to elementary students, but also to those who are further advanced.

THE NEW EDDYSTONE LIGHTHOUSE: A STRUCTURAL ADVANCE IN THE CONSTRUCTION OF SEA-TOWERS.

It is now some seven years since the Corporation of Trinity House, which had for some time directed anxious attention to the great tremour which was caused in the Eddystone Lighthouse by each wave-stroke during heavy storms from the westward, came to the conclusion that one of the noblest monuments of marine architecture which the world possessed gave unmistakable signs of approaching the term of its existence. Built, as most of our readers may be aware, by Smeaton in 1757, on the destruction by fire of the wooden tower erected by Rudyard, in 1706, after the disappearance, in a violent storm in 1703, of the original lighthouse built by Winstanley in 1699; the structure of the Eddystone tower was long regarded as one of the proudest triumphs of that class of architecture. The bond given to the stones, by dovetails, cramps, dowels, and trenails, was such as almost to emulate the unity of vegetable growth. But in the constant strife of 120 years duration, the never slumbering energy of the attack found two weak points that were assailed with success. So graceful was the curvilinear outline of Smeaton's sea tower, that the waves ran up it as they played on its base; and striking, at a height of 60 ft. above high-water level of spring tides, on the underside of the projecting cornice of the lantern gallery, actually lifted the portion of the building above this level. In 1839, and again in 1865, the upper part of the structure was strengthened, the projection of the cornice was reduced by 5 inches, and strong wrought-iron ties were introduced, extending from the lantern floor downwards to the solid base of the tower. The leakage which had followed on the shaking of the upper story was thus arrested, but the undermining action of the sea on the gneiss rock on which the tower was built proved more irresistible, and it was finally determined to erect a new tower, on the same rock, at a distance of 120 ft. from the site selected by Smeaton. The only drawback to the new site was that a large portion of the foundation had to be laid below the level of low-water spring tides. This difficulty was overcome by the skill and energy of Sir James Douglass and his staff with extraordinary success. The first stone of the foundation was laid by H.R.H. the Prince of Wales on August 19, 1879, and from that day until the latter end of the December following, 131 landings were effected on the rock, work was carried on for 518 hours, and 114 stones were set in seven courses, the average working time secured being nearly four hours per landing.

In March, 1880, work was resumed, and by the 17th of July the whole of the cylindrical base was completed. This part of the structure, as to which no corresponding feature existed in Smeaton's tower, is one of the alterations introduced by Sir James Douglass which merits the closest attention. It is 44 ft. in diameter, and 22 ft. in height above the rock-cut foundation, the top being 2 ft. 6 in. above high water springs. The elliptic curve of the tower itself springs from the solid platform afforded by this cylinder; allowing a ring of 5 ft. diameter around its crown. The object of this step was to break that upward run of the waves which, as before mentioned, so often obscured the light, and which had developed such mischievous effects on the cornice of Smeaton's tower.

The younger men of the present day, as Sir R. Rawlinson justly observed on the occasion of the reading, at the Institution of Civil Engineers, of a paper descriptive of this new lighthouse, can scarcely appreciate the difficulties that have been met and overcome by the builders. Working in a rough tideway, excavating and laying the foundation courses below low-water level, fighting step by step with an unrelenting sea, in which it was often barely possible to keep the tender at her moorings, the builders of the new Eddystone have completed a work which, among similar structures, is unrivalled both in rapidity of execution and in cheapness of cost. The estimate for the work was 78,000*l.* The lowest tender received was considerably in excess of this sum. On this being discovered it was determined that the work should be executed under the care of Sir James Douglass, without a contractor, and the prime cost was only 59,255*l.*, which was equal to 18s. 8d. per cubic foot.

It is known that, theoretically speaking, the most advantageous outline for a sea tower is one formed by a hyperbolic curve. The volume of a tower, thus designed, of 120 ft. high, 42 ft. in diameter at base, and 16 ft. in diameter at top, is close upon 63,000 cubic feet, while 85,000 cubic feet is contained in a conical tower of equal dimensions. In the New Eddystone, the focal plane is at an elevation of 132 ft. above high-water level, or 60 ft. higher than that in Smeaton's tower. The diameter of the tower is 34 ft. at the base, and 18 ft. at the under-side of the cornice. With the exception of space allowed for fresh-water tanks, the masonry is solid for 25 ft. 6 in. above high-water level; from which point the thickness of the wall gradually diminishes from 8 ft. 6 in. to 2 ft. 3 in. The masonry consists of 2,171 stones, containing 62,133 cubic feet of granite, or 4,668 tons.

The object of the drum, or cylindrical base, from which the shaft springs, was to break the force of the waves, and cause them to fall over on themselves instead of running up the shaft of the tower. The further advantage of a convenient landing platform is offered by the design. In the old tower the water frequently fell in a cascade over the lantern, thus obscuring the light; a mischief which has been altogether obviated by the stepped base, and superior height of the new tower. It has been asked whether the expedient of a step thus introduced could not be advantageously repeated, giving a stepped, instead of a curvilinear, outline to the base of the tower. The reply to this question is, that the size to be given to the step depends on the magnitude of the wave that assails it. In 1834 the stepping of each course of masonry was adopted by Mr. Walker at the Menai Lighthouse; and Sir

James Douglass freely admits that where small waves have to be dealt with this profile is the true one. But it was found at the Bishop, the Wolf, and other rock lighthouses, that the effect of small steps was very feeble in arresting the upward trend of a very large wave, being, in fact, little more than roughening the surface of the curve given by Smeaton. By the large cylinder, the large wave is at once divided; and the heavy stroke of the falling water is received on a compact mass of solid granite masonry, which is far stronger to resist the impact than the gneiss rock on which the tower stands has proved to be. It is admitted that a heavier blow is delivered on the cylindrical than on the doubly-curved surface, although it does not seem clear that the difference can be more than that due to the sine of the angle of impact; but the blow is delivered at the point where the structure is best able to receive it, and at the point of least leverage, and thus has the least destructive effect on the rock foundation below. And the secondary blow, as that on the under side of the cornice, which proved to be the most destructive part of the assault of the sea on the tower of Smeaton, is thus entirely avoided.

What sort of a blow the sea can strike is not now mere matter of comparative estimation. That, in certain conditions, it is so heavy as to be irresistible by any mass of concrete, whatever its solid bulk, owing to the low specific gravity of the material, seems to be unquestionable. Mr. Thomas Stevenson is the inventor of an appliance, called the marine dynamometer, which measures the actual force of the impact of a wave. In 1843 and 1844 the average force of the waves at Skerryvore was ascertained by this instrument to be a little over 600 lb. per square foot. During the winter it rose in the same locality to more than threefold that energy, or to above 2,000 lb. per square foot. At the Bell Rock, the highest indication attained was over 3,000 lb. per square foot; but at Skerryvore a maximum of 4,335 lb. per square foot was attained, and Mr. Alan Stevenson subsequently recorded the enormous stress of 6,000 lb. per square foot.

The design and structure of sea towers is a branch of architecture that follows laws and rules of its own. Under no circumstances are larger demands made, not only on the skill and foresight but also on the courage, hardihood, and perseverance of the architect than in the case of such a lighthouse. The account of the erection of the Bell Rock Lighthouse, by Mr. Robert Stevenson, in 1807-10, has all the breathless interest of fiction, as fiction was written by its greatest master in the English tongue,—we cannot call the dramas of Shakespeare fiction. Since the demolition of Smeaton's Eddystone tower, Stevenson's Bell Rock tower remains as the earliest existing type of a class of bold and skilful works, still few in number, which has each converted a dark sunken danger into a source of light, guidance, and safety to the sailor.

The method of dovetailing together all the stones, both vertically and horizontally, which was introduced by Sir James Douglass in the Wolf Rock Lighthouse, and is described in his paper on the same, has carried out the original idea of Smeaton to still greater perfection. The stone employed was granite. The blocks for the solid portion of the towers were quarried at Dalbeattie, and delivered on the site of the work ready dressed and fitted. On the completion of the solid portion of the towers, the granite for the higher courses was supplied from the De Lank quarry. The stones were set in Portland cement.

A gradual increase in size is so remarkable a feature of the progress of the art of the lighthouse builder, that it will be interesting to subjoin a table showing the contents, and also the cost, of ten of the most famous of the sea-towers that now protect our stormy coasts.

The contents and prices are given by Mr. W. T. Douglass. The dates, heights, and architects' names we have added; but have not traced the name of the architect of the Hanois or of that of the Longships Lighthouse.

NOTES.

THE latest volume of the Transactions of the Institute of Architects is a really valuable one, and ought to go far to answer those malcontents who insist upon it that the Institute is doing nothing for the profession. The voluminous paper by Mr. Robins on "Fittings for Applied Science Instruction Buildings," together with the hints and comments contributed by various other speakers, some of them experts in relation to the subject treated, and the large number of beautifully-drawn plans and sections of buildings and fittings, combine to render this paper one which in itself gives definite practical value to the volume containing it, and which no architect who is concerned in the planning of such buildings ought to ignore. Of special interest in another way is Mr. Tarver's paper on "English Monuments of the Sixteenth and Seventeenth Centuries," also very largely illustrated. Col. Parnell's rather eccentric paper on the "Action of Lightning on Buildings" had the merit, besides its boldness and originality, of eliciting several valuable contributions in the course of the debate; and Mr. W. H. White's review of the education and position of architects in France during the last two centuries is another valuable and exhaustive paper on a subject on which he has special qualifications for speaking, and with which we in this country are not very familiar. Whatever differences of opinion there may be as to details, the volume is, to say the least, no commonplace production.

It is hardly to be supposed that the decision of the Committee against the Parks Railway Bill closes the subject; we shall probably hear more of it, with modifications, before long. But the decision is a satisfactory indication of the necessity which is felt for very great caution in admitting a scheme which may prove a permanent injury to the Parks, and which, practically, could not be got rid of when once carried out. It is not yet by any means proved that the ventilation of the tunnel could be efficiently carried out without intermediate openings, and the want of actual junction with the main line at Westminster would be a serious drawback to the usefulness of the new line. Whatever the ultimate result, it is much better that more consideration should be given to the scheme before anything definite is done.

THE system which appears to have been adopted in regard to the proposed Liverpool Cathedral competition, of inviting architects to send three sketches of churches they have built or designed, and from these selecting some to compete, is a good enough plan in itself; but in declining any drawings which have been made since the date of the advertisement inviting them, the committee have possibly deprived themselves of the ideal best man they are looking for, and cut out all the genius which may be latent among the youngest members of the profession. It is quite possible that some young man of genius, who has not yet built a church, may be stirred up by the greatness of the occasion to do something great. From this chance the committee have cut themselves off, unless they reconsider their decision, and determine to take the sketches on their actual merits, without asking when they were done.

MR. JUSTICE FIELD'S judgment in the case of the Gas Light and Coke Company v. The Vestry of St. Mary Abbots, Kensington, gives

Year established.	Name.	Architect.	Height.	Contents.	Cost.	Per cubic foot.
			Ft. in.	Cubic feet.	£	£
1757	Eddystone	Smeaton	68 0	13,343	40,000	2 19 11
1811	Bell Rock	R. Stevenson	100 0	28,530	55,619	1 19 0
1814	Skerryvore	A. Stevenson	150 0	58,580	72,200	1 4 8
1853	Bishop Rock	J. Walker	110 0	35,209	34,559	0 19 7
1861	Small's	J. Walker	125 0	46,386	50,124	1 1 7
1862	Hanois		160 0	24,542	25,296	1 0 7
1870	Wolf Rock	J. H. Douglass	110 0	59,070	62,726	1 1 3
1872	Dhu Hartach	D. A. Stevenson	107 5	42,060	72,634	1 14 6
1873	Longships		110 0	47,610	43,869	0 18 5
1881	Eddystone	J. H. Douglass	133 0	65,198	59,255	0 18 2

"check" to the steam-roller to some extent. The laudable anxiety of the defendants to do their work efficiently had led to a continued increase in the size and weight of their steam-rollers, followed by a corresponding increase of breakage in the plaintiffs' gas-pipes. It was argued for the defendants that plaintiffs should have laid their gas-pipes deep enough to have been out of the reach of the pernicious effects of the roller; an argument which we observe that some non-professional newspapers have taken up as the rational answer in the case. It is not, however, in all cases possible to do this; there are drains to be considered, for example, the level of which is fixed by unalterable requirements of fall. The learned judge ruled that the steam-roller was not to be regarded as ordinary traffic; it was extraordinary weight moved over the road for a special purpose. The effects of ordinary traffic could be counted on, the possible enlargement of steam-rollers could not; and it has evidently been felt that their power had increased, was increasing, and ought to be diminished. Both plaintiffs and defendants were doing public service, but must do it so as not to injure each other; and the employment of very heavy rollers was simply a question of supposed economy of power: that is the effect of the judgment on a rather curious point in regard to rights on the public way. The damages were merely nominal, the object of the action being to ascertain the rights on each side.

The visitor to Mr. Whistler's small exhibition at Messrs. Dowdeswell's Gallery in New Bond-street, comes, after passing through the front shop, into an apartment which is at least an exceptionally charming and effective bit of colour-harmony as a whole. An upper wall of a delicate rose-tint, with dado and mouldings in flesh-colour and grey (it is called a "harmony in flesh-colour and grey"), hung with small works representing various "Harmonies" and "Notes" in colour, produces on the eye a soft misty effect of delicate colour which seems to pervade the air of the apartment, and not merely to lie flat on the walls. The general effect is certainly far more successful than the "harmony in white and yellow" which astonished the eye in another of the artist's exhibitions not very long since. When we come to study the paintings separately, of course there is much more room for difference of opinion. Some of them, though bearing such high-sounding and significant titles, are little better than daubs; others, which appear so at first view, and on close inspection, fall into their place wonderfully when viewed at what we take to be the distance the painter intended: numbers 6 and 9, for instance. A good many contain figures of young girls reading, lounging, in various attitudes, their dresses and surroundings giving the colour combination which is denominated "Pink Note" (N.B. Not a *billit-douz*, but a "note" in the scale of colour), or "Harmony in Violet and Amber." These figures are very slightly sketched, and their faces will certainly not bear looking close at; but they nearly all have character in pose, and show that there is good drawing underlying their shadowy similitude; one in particular, "Yellow and Grey" (43), a girl standing before a background of yellow, is charming in attitude and in the masterly indication of the figure. A life-size oil painting of a child called "The Blue Girl" is admirable in its way, both in colour and drawing, except (in regard to colour) the shaded side of the face, which looks as if not clean. The programme is prefaced by a highly characteristic little profession of faith, in axioms after the Euclidean manner:—"A picture is finished when all trace of the means employed to bring about the end has disappeared": "the completed task of perseverance only has never been begun, and will remain unfinished to eternity,—a monument of good will and foolishness," &c. Of course these are only half truths, but they are at least one side of the truth, expressed in a very pungent manner. Of course, too, some of the drawings are little more than smudges, and all, except the "Blue Girl," want precise delineation; but it is not because Mr. Whistler cannot draw

with precision if he chooses. He has chosen to evolve an eccentric type of art for himself; and we have no wish to see imitators of him; but there is a method in his madness, and, as his own, it is a refreshing little vagary, and has, at least, the merit of being what may be called "anti-Philistine"; and though some of it may be absurd, those who think it merely absurd proclaim their own defect of perception.

LORD STRATHEDEN AND CAMPBELL'S intended motion in regard to smoke abatement, which was to have been brought forward (as we mentioned) last week, but owing to circumstances was postponed, is now to be replaced by a Bill, to be introduced next week in the House of Lords, to give discretionary power to each vestry to compel the use of either smokeless fuel or smoke-preventing grates within its own jurisdiction; or, more strictly speaking, to legislate for the prevention of smoke, leaving it to householders (for the present) to adopt whichever method they find may enable them best to comply with the provisions of the Act. It is hoped that, without attempting at this moment any such serious scheme as compulsory prevention for the whole of London, this permissive power given to the vestries may induce one or another of these governing bodies to lead the way in making the experiment within its own district, and thus afford a practical test of the possibility of dealing with the subject by legislation. To have selected any district arbitrarily for experiment would have probably raised the opposition of that district; by the plan proposed the onus of putting the machinery in motion will be left with the parochial authority of each district.

The members of the Sunday Society and other friends of the Sunday opening movement having almost unanimously pronounced in favour of an annual motion being made in the House of Commons for opening on Sunday afternoons the whole of the museums, galleries, and libraries supported by national funds, it has been decided, after consultation with Parliamentary friends, to adopt this course, and a motion will this year be introduced by Mr. Geo. Howard, M.P., and Mr. Thos. Burt, M.P. This annual test of Parliamentary opinion seems a very good scheme for keeping the subject before the public mind, and securing a record of the progress of the movement, even if it lead to no immediate result.

The history of English costumes which Mr. Lewis Wingfield has contributed to the Health Exhibition is certainly attractive, and, to a very limited extent, instructive; but the figures are nothing like being sufficiently numerous, and the details are often wrong. It is a fact,—scarcely credible or creditable,—that not one of the representative gentlemen of the last century wears a sword, and that the cane,—and such a cane!—is introduced at every period of history. The boots, also, of the huntsmen in particular, are clearly incorrect as regards material. The whole series bears evident traces of hurry,—a characteristic apparent in many of the departments.

The decision of the Railway Commissioners in favour of the Post Office, in regard to the laying of over-head wires to connect the Fire Brigade stations in Battersea, Wandsworth, Tooting, and Clapham, gives a slight and, perhaps, useful check to the rather exaggerated clamour against all over-head wires whatsoever which has been raised. That a number of wires working in a large system should be placed underground is right and reasonable, but it is hardly reasonable to demand that one wire, necessary for a most important service to the district affected, should be placed underground at a cost which would probably have proved prohibitory.

MESSRS. TOOTH & SON'S exhibition of water-colours at their gallery in the Haymarket is a small collection of drawings with a considerable proportion of good work among them.

There is a delightful little Cheviard, "Criticism is easier than Art"; a fine interior by Mr. A. C. Gow; some good specimens of G. A. Frupp, Birker Foster, Mrs. Allingham, Louis Leloir, and other well-known names. The central work is Fred. Walker's reproduction in water-colour of his memorable painting, "The Harbour of Refuge."

THE sale of plate, porcelain, pictures, and furniture, which belonged to the late Mr. Charles Skipper, occupies three days of this week at Christie's. Some things of great beauty and interest are under the hammer. Three separate catalogues are issued. In the first day's sale (Thursday), though its artistic value may be small enough, the object of greatest general interest is the "Kemble Testimonial," a large piece of plate presented to the actor upon his retirement from the stage in 1817. The admirers of Irving could hardly, in his honour, amend the legend:—"To John Philip Kemble, on his retirement from the stage, of which for 34 years he has been the ornament and pride; to which his Learning, Taste, and Genius is indebted for its present state of refinement; which, under his auspices, and aided by his unrivalled labours, most worthily devoted to the support of the legitimate drama, and more particularly to the glory of Shakspeare, has attained to a degree of splendour and propriety before unknown, and which, from his high character, has acquired increase of honour and dignity: T. V. Vase, by a numerous assembly of his admirers, in testimony of their gratitude, respect, and affection, was presented, through the hands of their president, Henry Richard Vassall, Lord Holland, June 27th, 1817." "More is thy due than more than all can pay." The erection is 26 in. in height; it is three-sided; on one side is the tragic queen crowning the actor; on another is Cupid pointing to a bust of Shakspeare; on the third the inscription just quoted. China lovers will have found much to delight them in a large collection of Dresden, and another of Sevres porcelain. Amongst the former is a fine old dinner-service in 167 pieces. Of promiscuous specimens, the most important perhaps are two large Worcester vases by Flight, Barr, & Barr, which must, therefore, have been made between 1813 and 1829; and a fine pair of old Wedgwood vases. The last day of the sale (to-day) will be devoted to the pictures. These are mostly modern.

THE grievances of the Wellington statue die hard. They again occupied, on Tuesday, the House of Lords in a debate of considerable length, *à propos* of two motions, one by Lord Stratheden and Campbell, that the statue should not be removed till we had an opportunity of judging of the new one which is to replace it; the other by Lord De Ros, that the statue should not be removed from London. The first-named motion was eventually withdrawn in favour of Lord De Ros's "amendment," which was carried by a majority of 22. As there is no talk now of destroying the statue, and as the present Duke has expressly stated his opinion that by the course proposed "full respect is paid to the memory of his father," the subject ought to be considered settled. The debate was amusing enough in some ways, and the suggestions as to the possible social and political consequences of deporting the statue reminded one of the tag sentence of a well-known farce,—*"The thunderclouds that are now closing over the political horizon."* &c. Certain gallant officers, too, had been in the habit of raising their hats to the statue, and would lament the loss of their idol; but, as Lord Powerscourt, in a very practical spirit, observed, those gallant officers might as well raise their hats to a good statue of the Duke as to a bad one. Let us hope we shall get the "good one."

Surveyors' Institution.—The annual general meeting of this Institution will be held on Monday next at three p.m. The annual dinner will take place on the same evening in the Venetian Saloon of the Holborn Restaurant.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

We have not for many a day seen so strange a design as that described as "Front-door Gable, Collyers, Petersfield, Hants: Bateman & Kates" (1,280), and in saying this we do not wish to be understood to imply anything in disparagement of the same. It is so entirely original as almost to baffle criticism, and must be judged by canons as yet unformulated. We feel in the presence of a new phase of art, and are compelled to suspend our judgment thereon.

The drawing shows in geometrical elevation a street frontage of perhaps 30 ft., comprising a ground-story, a first floor, and a large expanse of gable above it. What is behind the gable, and whether it is only an artistic sham, we are unable to conjecture. The materials employed are apparently red brick, some variety of red stone resembling Mansfield in tint, and here and there a little black and white marble, or may be tiles. The spacing of the solids and voids throughout is little less than audacious.

In the centre of the first floor the two segments of a semicircular arch are separated by a short length of horizontal lintel, to accommodate a shield bearing a coat of arms. On each side of the central division two semicircular arches continue the arcade, one on each side being pierced as a window, and two fractions of similar arches, one on each extremity of the façade, complete the series, their curves running abruptly out at the quoins.

In the centre of the ground-floor is an ogee-headed doorway, the archivolts enclosed by horizontal and vertical lines of labels and the spandrels filled in with chequers of black and white. The apex of the ogee bears a vase on which the word "PAX" is inscribed; and from the vase a free arrangement of not ungraceful foliage expatiates in the arched recess above. A helmet and crest fill a small niche at a higher level, and the string-course is broken over a narrow panel bearing the legend, "MORS VIA AD VITAM." The side windows on the ground-floor are placed centrally with the arcade above, and their outer jambs are within 14 in. of the lateral limits of the frontage. The windows resemble in general design the central doorway, their summits having similar but smaller sprays of foliage delicately designed and drawn. The large gable is occupied in a singular manner. A chimney-stack rises from the foot of each raking coping. In the centre a very small circle is filled with glass, and from it long horizontal and vertical bars form a cross, the arms terminating in circles containing respectively the words "SANS DIEU RIEN." An owl peeps from a foliage-sheltered nook on one side, and a (?) jackdaw from a corresponding nook on the other side. Every brick is delineated with praiseworthy decision, the minutest detail being portrayed with rigorous exactitude.

A little comedy is being played out for the amusement of the spectator. At the left-hand window the son and heir is making love to the parlour-maid, while his mother, who is dressed for a morning walk, discovers his secret and pauses in the porch in listening wonder. A skye terrier, the companion of her walk, is excited at the discovery; but is too well educated to disturb so dramatic a situation by barking, and a white cat dozes on the sill of the companion window, giving to the whole the necessary sense of repose. We give a simple description of the composition and its accessories, but abstain from hazarding any opinion upon its merits as a work of art. To many it will probably be an occasion for a scornful sneer, and others will see in it, no doubt, the only real hope for English architecture. For ourselves, if compelled to make the avowal, we confess to a sort of liking for what is, at any rate, entirely original,—a quality too rare to be contemptuously treated,—and for the daring directness of its expression, not without some misgiving, however, that the authors are making game of us, and that the whole thing may be an elaborate jest.

1,241 (Sketch of South Door, Bourges Cathedral, France) and 1,257 (Sketch of Staircase of Hospital at Santa Cruz, Toledo, Spain), both by R. T. Blomfield, are most beautiful and conscientious studies in pencil of very complicated architectural subjects, and we commend them to the notice of all students. Such exercises, so patiently wrought out, are more valuable as a training for the eye and hand than acres of the dodgy "flicked up" pen and-ink

drawings which just now appear to fascinate the ingenious youth. While on this subject, we may again advert to the patient care shown in Mr. G. E. Jefferison Jackson's "View from Guard-room of Churchyard, Mont St. Michel, Normandy" (1,212), and the "Château de la Gendarmerie, Caen" (1,269), in which extreme faithfulness of portraiture is combined with light and atmosphere almost beyond what one would have supposed capable of attainment with such simple means as pen and ink. A very beautiful drawing (1,281) of the south transept of Westminster Abbey, by A. Hemingway, and a more (cheaply) effective drawing of "The Tomb of Lord Treasurer Burleigh, in the Church of St. Martin, Stamford," by Mr. G. C. Horsley, are excellent examples of their respective kinds. Of decorative works and designs for stained-glass there is a fair sprinkling, but, with the exception of the design for the decoration of St. Paul's (before noticed by us) nothing which calls for any very special mention. Designs for stained glass do look so very much like one another, and so very unlike the real thing, and the effect of the decorative treatment of a room 50 ft. long cannot be conveyed in a drawing of the size of a sheet of foolscap. In 1,219, Mr. Owen W. Davis shows a Pompeian design for the decoration of a vestibule, full of much graceful ornament and pleasing colour; and 1,322 "A London Drawing-room," by Geo. Aitchison, A., the treatment of the walls in a dull, rich gold, is sumptuous in the extreme. Messrs. Heaton, Butler, & Bayne show a design for decorating the hall of a City company (1,342), and display all their accustomed skill in this class of work. A high waistcoat *dado* is surmounted by pictures from the history of the company; portraits of distinguished members of the guild figure in the great hall window and their arms in roundels above, and in the deep frieze which runs round the upper part of the wall. By a pretty conceit the animals, whose hides form the staple of the company in question, leap and sport in and out of the convolutions of the ornament which is framed of forest foliage. It is a thoughtful and pleasing scheme, and would, we have no doubt, look well in execution,—would, in fact, gain in effect with the enlarged scale of the actual work.

FURTHER NOTES ON THE ACADEMY PICTURES.

MR. FILDERS'S brilliant painting, "Venetian Life" (390), representing a group of young women at the doorway and on the steps of a house opening on one of the canals, is certainly among the successes of the year. The light is concentrated on the centre figure, a blonde girl with a mass of white muslin spread over her knees, on which she is at work; there is no story in the picture, it is simply a group, brilliant and glowing in colour and finely drawn. His single figure, "A Venetian Flower-Girl" (747), enshrined amid a wealth of flowers, is perhaps even finer; and, compared with the artist's work of last year, "The Village Wedding," these Venetian pictures strikingly illustrate his versatility. Among other Venetian subjects is Mr. Woods's "Il mio Traghetto" (390), a Venetian ferry and its owner and family, and Herr Van Haanen's "Afternoon Coffee" (721), a clever but rather vulgar interior of a work-girl's shop, containing figures of some variety of character thrown together in a confused group with no attempt at composition, and one or two of them very carelessly drawn. Far beyond these in artistic excellence are Herr de Blaas's two pictures, "After Church" (423) and "Secrets" (832), the latter, a small work of three figures, exceptionally clever in drawing and expression, almost surpassing his "Flirtation" of last year.

Mr. Briton Rivière's best work is "The King and his Satellites" (88), a very large lion followed by a group of jackals, in whose bickerings and furtive glances at the big animal a great deal of humour is expressed. His "Eve of St. Bartholomew" (52), a girl with a bloodhound, is incomprehensible in relation to its title; and "The Enchanted Castle" (437), where a very stogy-looking knight in eccentric armour mounts the steps of a portico, in the doorway of which two "small but healthy tigers" stand in a menacing attitude, looks like an elaborate joke. Going back to the first room, and touching on some of the remaining figure-subjects in order of hanging, we may notice a figure by Mr. Long (28), which is

called "Judith," but might have any other name; and a very clever work by Mr. Holl, a portrait of a young boy with a sword, and the title, "Did you ever Kill anybody, Father?" (67), an idea apparently taken from an incident in "The Newcomers"; the colour is a harmony in red and black; the look of alarmed and anxious inquiry on the boy's face is capitally given. Mr. Faed's two works in this room (87, 93) are in his second-best manner only.

In Gallery II., Mr. Morris's "Crowns of Joy and Sorrow" (117) is a churchyard scene, in which the emblems of baptism and burial are combined; a pretty picture with "a moral" in it. A very pointed little scene is Mr. Dendy Sadler's "Experientia docet" (129), card-playing between two priests, a puzzled novice and an elder and very astute man, whose face expresses good-humoured malice at the success of his play. We are very glad this capital artist is not going to keep in one groove in his subjects. Mr. Collier's large portrait group of the four "Daughters of Colonel Makins, M.P." (136), is a little too much of a romping scene, where the eldest, a grown-up young woman, is down on the floor, and the others pelting and otherwise worrying her; an effort at variety in portrait-painting not quite in good taste; the face of the elder girl is a beautiful bit of colour, the others rather hard. Mr. Frederick Brown's "Candidates for Girtton" (168), where a girl playing schoolmistress is examining some others who stand in a row against a wall, is very spirited and life-like, below it hangs a very different scholastic subject, Mr. Eyre Crowe's "School at the Aître St. Maclou, Rouen" (169), an old half-timber house with a long line of little girls ranged before it, each one a separate study. Mr. Cooper's enormous cattle-picture in this room is one of the things that must be protested against; the wall space occupied by this hard mechanical production, a mere repetition of what the same artist has done scores of times before, is simply stolen from some of those who might, but for the want of the mystical "R.A." after their names, have far more rightly claimed it. Mr. Holl's portrait of Mr. Carbutt (155), and Mr. Onless's of Canon Freemantle and Mr. Bancroft, (162, 190), are among the good portraits of the year; and Mr. Storey's "Art and Nature: a Study of Tone and Colour" (189), is an interesting and elaborately-painted interior on a small scale.

Most of the prominent works in Gallery III. have been already mentioned in our former article; we must draw attention, however, to Mr. Faed's best work, "Of What is the Wee Lassie thinking?" (267), a painting with a single figure of an interesting-looking child seated before the fire, and showing the successful treatment of low but harmonious tones which marks Mr. Faed's best work. A difficulty in painting scenes of peasant life, of these islands, is that truthfulness of representation almost necessitates dull and faded hues in raiment and surroundings, which it is difficult to render agreeable to the eye. Mr. Leslie is much better off in his (artistic) rank of society; in his "Thames & Roses," where a pretty girl sits with her feet on the window-seat of a riverside house, there is plenty of opportunity for warm and harmonious colour; and the level lines of the figure, the window, and the river outside, give a peculiar expression of repose to one of the pleasantest of Mr. Leslie's recent works. Mr. Marks's "The Angler's Rest" (232) falls short of his usual point and humour; the angler is painted from the same model whom we remember as the impatient listener to the recitation of a poem in another recent work of the artist. Mr. Holl's portrait of the Prince of Wales (298) as "Master of the Bench of the Honourable Society of the Middle Temple," is a good specimen of a ceremonial portrait,—a kind of work that only looks in place when hung in a large hall with other works of the same class. Among other works in the same room may be noted Sir F. Leighton's charming head, "Letty" (226), Mr. Holl's portrait of the Master of Charterhouse" (285); Mr. Rivière's "Actaon" (315), a study of dogs attacking a man,—the work is absurdly realistic for the title. Mr. Calderon exhibits a figure entitled "Night" (340), which suggests the idea of a portrait of Miss Anderson in Greek costume sitting on a stone seat in a garden by moonlight; the title suggests that the figure is an allegorical representation of Night, in which case she would be very unsatisfactory. Taking the title to mean merely "night-time," it is a work of considerable

expressive power, and showing very fine drawing.

The most prominent work in Gallery IV., after those we have mentioned, is Mr. F. Dicksee's "Romeo and Juliet" (430), at the moment of parting as the dawn breaks. Juliet, though wearing (as Bret Harte puts it) "that one formless garment that renders all women equal," need not have been reduced to such a poor little skimpole figure, certainly not worth climbing a balcony after. Both figures are commonplace, and quite beneath Shakespeare's conception. The effect of dawning light is well given. Equally beneath Lord Tennyson's conception is Mr. Stone's illustration, in two pictures (448, 449), of the exquisite song in "The Princess," "We fell out, my Wife and I," which we suspect was only added by way of a title after the pictures were painted. Painters should treat great poets with more reverence than thus lightly to vulgarise their conceptions. Sir F. Leighton's "Sun-gleams" (436) should not be passed over,—a brilliant, though (for the artist) a rather hard little work.

In a corner of Gallery V. is a small and powerful painting of the Impressionist school, "Fantaisie" (472), by Mr. P. W. Steer; a sketch of the head of a very remarkable-looking girl, of Southern character of face, half buried in a cloud of *tulle*. Mr. Hodgson's "Church Afloat" (484), the largest work he sends, is a scene at service on the main deck of a man-of-war; Mr. Hodgson has well given the feeling of all those rough honest faces composed to one expression of attention and seriousness during the service; it is an interesting, and what one may call a rather national kind of picture, but just comes short of its effect from a certain hardness and stiffness in the execution, so if the sailors were very good lay figures rather than living men. Mr. Oules's "Mr. Henry Whiting" (490), is one of the most masterly portraits of the year, a little sketchy, but full of life and expression. We have not yet mentioned Mr. Linton's large work, "The Declaration of War" (498), the first of his series in the "Life of a Soldier of the Sixteenth Century," though painted the last. It is a very effective work, though a trifle theatrical; or rather the great personage who, standing on his palace steps, makes the declaration with a good deal of declamation, is theatrical, and perhaps intended to be so. The declaration is received with mock deference by the envoys of "the Ottoman" who stand at the foot of the steps; behind the prince is the young knight in armour who is to be the hero of the struggle. It is a fine work, and we hope, now that the whole are completed, some opportunity will be taken of exhibiting them publicly together. Mr. Walter Horsley's "The French in Cairo" (516), is a clever work, as also Mr. Lockhart's "Gil Blas and the Licentiate Sedillo" (528), who is as much amused with the story as his gout will allow him to be.

Gallery VI. contains another of those immense expanses of canvas covered with nothing that any one cares for. Mr. Goodall's "Flight into Egypt" (619). For the Academicians to talk about want of space when one of their number covers so many square yards of wall with this kind of thing, is too absurd. Mrs. Collier's portrait of "Miss Nettie Huxley" (592) is a hard performance, showing some very good drawing. Mr. Waller's "The Orphans" (597) is a girl feeding some fawns,—not subject enough in it. Mr. Sant has captured a couple of pairs of twin daughters, whose dual portraits hang as pendants. "Ada and Dora Ismay" (618) are very pleasing portraits, as far as faces are concerned; the dresses are painted in a rather loaded manner. A really original bit of painting, quite inexplicable in incident, is Herr Van Beers' "Soir d'Été" (650), which looks like a chapter out of a very French novel; a meadow, a path surrounded by woods, a well-appointed carriage-and-pair in the middle distance, a girl dressed in the height of fashion on a seat in the foreground, and a large headless statue which played a flute when it had a head; the footmen in the distance look at the lady, who looks at or for some one invisible: it is Delphine who has an appointment with Eugène de Bastignac. The picture is utterly heartless, and yet is of value for its piquancy and its sharp distinction from anything proper to English art. Next to it is a good portrait head of a lady, under the title "Woolgathering," by Mr. Skipworth. In a painting of the "Unconverted Cavalier" (601), Mr. G. Seton has been imitating Mr. Marks, and not without success in spirit, though his painting is rather hard.

Mr. Heywood Hardy has some first-rate cavalry horses under the title "The Rear Guard" (691); he shines equally in "A Sale of Cavalry Horses" (French Cavalry) in the next room (739). Mr. Laselett J. Pott is advanced to a more conspicuous position than he has yet attained, but his "Disinherited" (693) is not so successful as some of his previous smaller works.

In Gallery VII. M. Dagnan has certainly made a hit in "Vaccination" (738). The only weak point is the head of the woman seated in the full light of the window; but the various expressions of the mothers and the poor little children with their arms bared for the operation, and laughing with each other, and the careful compressed lips of the official surgeon as he stoops over his work, make a group full of life and reality. We pass with a silent anathema another academician's stuffed sheep, which are produced by so many square feet annually, and pause at a little work of real feeling, entitled, "Deepening Shadows" (754), by Miss Margaret Dicksee; an interior where twilight is falling, and an old man sits, with his head bowed, by the bed, where a sick child is evidently past hope of recovery: the picture is not remarkable in execution; what strikes one is its simplicity of composition and unaffected feeling. M. Bonqueret's "La Nuit" is what we should describe as a very finely-painted Academy picture; the old style of allegorical figure, representing Night, floating through the air in an elegant attitude and craped drapery. Mr. Thorburn's "Daniel in the Lion's Den" (798), of course on the line (as the work of an Associate), is almost too ludicrous to believe in. What must foreign artists think when they find a work like this well hung? And what is the effect on public taste of this kind of rubbish? The Academicians who do know what they are about had better look to this. Of some large paintings in this gallery, Mr. Val Prinsep's "Saturday Dole in Worcester Chapter House" (810) is not a happy subject, involving the representation of a number of mean-looking and ugly old women, all in the attitude of expectation; and the picture certainly is uninteresting. "A Fen Farm," by Mr. Macbeth (805), is far too large for its subject and interest; there is much canvas to let, and a tone of landscape which is not natural nor pleasing; the figure and animals are good in themselves, but as a picture it is a struggling concern.

Gallery VIII. contains little of note in addition to the works mentioned in our previous article (we are purposely passing over landscape at present), if we except Mr. Herkomer's excellent portrait of Dr. Butler, and Mr. Hugh Cameron's clever and spirited little "Rustic Interior," called "The Rivals" (859), which shows also a certain originality of style. In Gallery XI. Mr. Herkomer has it all his own way in his remarkable painting, crowded with figures, entitled "Pressing to the West" (1,546), a scene in a New York building where emigrants have to pass through for registration before "going West," and where they often remain pigged together for days in default of other lodging. Mr. Herkomer has, perhaps, done a social as well as an artistic service in depicting this wretched scene, which we presume, is from actual observation, in its painful reality. The picture shows a long boarded room, in which people of all varieties of nationality are crowded together in the extreme of discomfort. A poor sick German wife puts away with her hand the food which her husband is trying to persuade her to try; a man, who seems like a low type of Italian, looks on mechanically; a dignified, long-robed old Jew, in the centre of the picture, stands with his handsome daughter on his arm, keeping as much as he can aloof from the contamination of contact with the others; an English labouring man looks over his shoulder at the daughter. A number of other figures, more or less prominent, each tell their own tale, and add to the effect of the whole. The realism of the scene is achieved without hardness of effect, and with due regard to artistic conditions, an instructive contrast in this respect to Van Haanen's picture before alluded to, also crowded, but crowded without method or composition. The next honours of this room are carried off by Mr. Eyre Crowe, in his capital and life-like painting of the "Fish Market, Ronen" (1627); there is a sale of fish by auction; a man stands on the slab where the fish are ranged, holding one up, the fish mer-

chant, seated behind the table, directs the sale with extended stick; his daughter (probably) and a servant make memoranda of the sale; a crowd press closely round, bidding against each other. The whole is very brightly and clearly painted, with no shirking of anything, and great variety of character in the faces. Further on a lady artist, Miss Conolly, makes a very good appearance with a work entitled "A Gap in the Ranks" (1641); and another, Miss Ide-Lovering, has a good little work entitled "Motherless" (1602). Mr. Gordon's "Maria and Joseph Surface" gives a good idea of Maria; as to Joseph, one does not expect to find more than once in a generation any one who can adequately either play him or paint him. Mr. Holl's "G. Fenwick, Esq." (1656) and Mr. Calderon's "Mrs. Henry Fellows" (1620) are two excellent portraits in very opposite styles.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MODERN BUILDING IN INDIA.—DOMES.

At the ordinary meeting of this Institute held on Monday last, Mr. Ewan Christian, President, in the chair.

The Chairman read the following resolution, which had been proposed that afternoon at a meeting of the Council:—

"Certain changes in the constitution of the Institute having been pressed on the consideration of the Council as being urgently needed, Resolved, that a Committee of the Council take into consideration the practicability of a modification of the Charter, or the grant of a new Charter, and the effect on the Institute of either course; also to confer with the Honorary Secretary and such eminent counsel as they may think fit, and obtain such information as they may consider desirable upon the subject."

The decease of Mr. Edwin Nash, a Fellow of the Institute, of long standing, was announced.

Mr. Fowler said, that as he had some personal knowledge of Mr. Nash, he would not like that his decease, after a painful illness, should be passed without some slight notice. Mr. Nash had occupied a very considerable position in the profession, and formerly, when his health permitted, he was a constant attendant at the meetings of the Institute, taking part in the discussions to the advantage of all.

Mr. Wm. Emerson (Fellow) then read a paper entitled, "A Description of some New Buildings at Allahabad and Bhownagur, India, with some Remarks on Domes, and the mingling of Styles of Architecture." There were various points, he said, to be considered in arranging buildings suitable to Indian purposes, points with which architects were not brought into contact in England, and which involved such differences in construction as to make it a delightful experience to leave the old highways of English architectural thought, and to work for a while in India. These points were chiefly the climate, with its intense heat and its total rainfall, almost incessant, but limited to a few months; next the habits of the Oriental, which made it hard for him to work save in the accustomed grooves of his ancestors; lastly, the innovation of modern Western thought, and, it might as well be added, of science and culture, so opposed to all the antecedents of the conservative Hindoo, and to his caste prejudices. In Allahabad the average heat was from 65 degrees to 98 degrees in the shade. At Nassich, in tents under the mango trees, he had experienced 120° of heat. Hence the necessity for elaborate means of ventilation, for verandahs, and for walls shaded by overhanging eaves. This arrangement gave a character to Indian buildings quite unlike that of our Western ones, and afforded the architect scope for picturesque dealing with light and shade unattainable in England. With regard to the habits of the Oriental workman it was shown in detail how much the English architect has to put up with in India, how completely he must possess his soul in patience unless willing to run the risk of death by heat-apoplexy. Mr. Emerson had to allow for a considerable percentage of defective workmanship, as was illustrated by his plans for a church and for the Muir College, both at Allahabad, and for the Takhtsinggi Hospital at Bhownagur. As to the style of architecture to be adopted by the English in our peninsular dependency, Mr. Emerson accepted, with some modification, the conclusion arrived at in Mr. Chisholm's last year's paper,—"that an architect practising in India should unhesitatingly elect to practise in the native styles." The present reader's

* See Builder, vol. xiv., p. 908.

later idea was, that buildings erected under the British Raj for any purpose connected with the natives, whether for Government, education, or charity, should show a distinctively British character, at the same time adopting the details and feeling of the native architecture, and suiting it to the requirements of each particular case. In answer to the objection that this would create a hybrid style, it was asked whether the mingling of Mahomedan and Hindoo art had not resulted in some of the most enchanting buildings of the world, as exemplified at Bejapoor and in the North-west Provinces. In Europe, also, were there not buildings as noble as any in the world,—for instance, St. Sophia's at Constantinople,—which were hybrid in style? Other examples were the Palermo Cathedral, San Mariato at Florence, the interior of St. Mark's at Venice, and the apse of our own Canterbury Cathedral. Indeed, were not the loveliest flowers and plants hybrids? and had not the intermingling of the different human families produced the noblest types of men? This was Mr. Emerson's apology for the architecture of the Muir College, and of the Takhtsinggi Hospital, which he felt must be described as hybrid. These buildings of his carried out, as he proceeded to show at large, his idea of impressing the stamp of the British Raj on modern Indian erections. Some sketches of Indian details which he exhibited explained whence he got his inspiration. Though for the most part from Mahomedan buildings, they were, nevertheless, of Hindoo origin. That from the fort at Agra was certainly old Hindoo work re-used by the Mahomedans, and so was the column from Bejapoor. One of the most interesting points to himself in these Indian works of his, Mr. Emerson said, was the chance of introducing domes,—a chance rarely falling to the lot of an architect practicing in England. In the dome over the hall of the Muir College, he had taken the type of the Taj Mahal for outline. Mr. Emerson proceeded to describe and compare these two domes, and gave some account of the library dome of the college and of the hospital dome. After a comprehensive survey of the principal domes in East and West, Mr. Emerson said it seemed to him that the highest perfection attainable in the construction of a dome would be a combination of the arched pendentive arrangement of Mahmoud's Tomb, surmounted by a circular dome of the conical section of Sta. Maria at Florence, or that of the tomb of the Shah Khoda Benda, with a slight additional bulbousness of the haunches, and a weighty cornice hung inside about one-third of the height above the springing. Part of this idea was in his mind when he designed the dome over the Sitzungsaal in the competition for the Berlin Houses of Parliament. In this case he proposed supporting the large lantern by flying buttresses, over the dome, rather than by a double shell. One good point of this construction internally would be that the spandrels would offer such advantages for mosaics or fresco, being at an easy angle of vision,—an important thing at a great height. He believed that with Portland cement concrete and a network of galvanised iron or copper embedded in it, to supply the fibre lacking to concrete, the upper part being composed of an aggregate of light specific gravity, with heavy material at the base, we might construct perfectly stable domes of larger size than any ever yet built, of more effective external and internal design, and of comparatively light weight. Internally, the dome was by far the grandest and most impressive method of covering a large area. There was a mystery about the gloom of the interior of a vast cupola that well suited the imagination of an Oriental. And in all great architecture there should be a certain mysteriousness. He had read that a science without mystery is unknown, and that a religion without mystery was absurd. He felt sure they might add that architecture without an element of mystery is unpoetical and unimpressive. It was this quality in our great Gothic cathedrals, caused by the ranges of columns, arches, and vaults that was the chief reason of their attractiveness, but they lacked the feeling of immensity and spaciousness given by the dome. Yet a dome should not be too light, nor its vastness too easily penetrated. He thought the effect of St. Peter's was marred by this. The interior of St. Paul's was on this score more effective. Some would ask, How about the decoration? Well, the decoration of St. Peter's was too plainly visible, and if St. Paul's should

be treated correctly by means of well-designed subjects with strong outlines, devoid of dark shadows and rendered in the brightest glass mosaic, it would be quite visible enough down below, with enough of the mystery emblematic of all spiritual and heavenly things. But for decoration in such a position the colours must be brilliant, for the joint effect of distance and the atmosphere would be to dull an emerald green down to grey, and a bright vermilion to dingy red. Mr. Emerson mentioned that he often wondered why our architects who had had the chance had never erected a dome in connexion with a Gothic Church in England. It was not needless, as was proved by our enormous congregations, many of whom could neither see nor hear on account of the blocking up of the lungs of the churches with the enormous piers. He wanted to see a magnificent Gothic interior opened up after the manner of the Duomo at Florence, and numbers of other Italian churches. But he could not see why the grandest of all features should be almost exclusively found in Classic and Oriental work. There might be certain difficulties to be overcome, but nothing insurmountable, and with the earlier types of Transitional architecture, the dome would perfectly harmonise. Might it not happen that in such an endeavour to blend Classic and Gothic we might strike the architecture of thirty years hence, as hinted by Professor Kerr in his interesting paper read at the recent Conference of Architects.* Let it be a Renaissance suited in every way to our modern requirements, not such as Italy saw in the fifteenth or sixteenth century, but a Renaissance of the mingled spirit of Classic and Gothic exemplified in some such works of an earlier century as he had already mentioned. The desiderated Renaissance was one with arms long enough and bold enough to embrace the lintel, the round arch, and the pointed arch, the picturesqueness of the Gothic vault, and the dignified nobility of the Classic and Oriental dome, with an elimination of the crudities of Gothic art, and an enrichment with the graces of the Classic style. Before such an architecture a style which worshipped nothing but quaintness, whose ideal of nobility was only the picturesque, and whose detail and sculpture were debased and meaningless, might surely vanish into the haze of oblivion from which it was evolved. But he did not yearn after a Renaissance whose constructive element was iron. That might suffice for bridges of thousands of feet span, for earthquake-proof buildings, for fire-proof roofs and floors, for girders, ties, and cement. An architecture to be noble and impressive must not be wanting in mass, and an iron edifice was but a skeleton wanting the clothing of flesh and skin to give it life and beauty. We called that a human skeleton from which the soul had fled, and on the same principle an iron architecture would be found to lack the nobility of a living art.

Of the discussion which followed the reading of the paper we will give a special report in our next.

REGENT-STREET BRANCH OF THE ALLIANCE BANK, LIMITED.

THE directors of the Alliance Bank having determined to open a West-end branch, acquired premises at the corner of Princes-street, Regent-street, which,—with the consent of the Office of Woods and Forests,—were pulled down and the present building erected from the designs, and under the superintendence of the architect to the bank, Mr. Fred. Pinches, 5, John-street, Adelphi, W.C. The ground-floor is principally devoted to the banking office, which is entered from a doorway at the angle of the building. The manager's room opens out of the banking room, and is divided from it by a glazed wainscot screen. The whole of the fittings, entrance doors, lobbies, &c., are in waincoat dead polished, the public space in front of the counter being laid with mosaic. At the rear of the manager's room is the stone staircase to the basement, and also the hydraulic lift for the bullion, plate-chests, &c.

Great care has been taken in the construction of the basement, which contains two strong rooms, the thick walls of which are lined with Bessemer steel plating, and have strong iron doors and gates of the most approved description, made by Messrs. Hobbs, Hart, & Co. In this floor are placed the heating-chamber, lava-

tory, water-closets, &c. The entire area of the ground-floor is of fireproof construction.

The private entrance to the manager's residence is placed in Princes-street, and leads through an entrance-hall to the principal staircase. On the first-floor are the dining and drawing rooms, on the second and third floors the bedrooms, the kitchen scullery, servants' bedroom, &c., being placed on the top floor.

The frontages in Regent-street and Princes-street are executed in Portland stone. The works have been carried out expeditiously and satisfactorily by Messrs. Lucas Bros., and were opened for business on the 3rd of March last.

RECEIVING-HOUSE AND CASUAL WARDS FOR THE ST. GEORGE'S UNION.

THE Workhouses belonging to the St. George's, Hanover-square, Board of Guardians (until lately situated in the aristocratic neighbourhood of Mount-street, Grosvenor-square, and Victoria-street, Westminster), having, within the last two years, been removed to the new buildings erected in the Fulham-road, it became necessary to provide in some central spot of the Union a house where applicants for admission to the Workhouse could be first seen, and examined as to their fitness for admission. It was also thought that the casual wards should be located in a spot more central than at present to the districts comprised in the Union. Thus it is that the building illustrated by us this week comes to be erected. It provides accommodation in the front building, on the ground and first floor, for the reception of sixty casuals, each of whom is accommodated with a separate apartment or cell. The third floor is fitted up as sick wards for twelve patients of each sex, and these, being designed upon the latest principles advocated by hospital experts, will be especially well a visit from those interested in such matters.

The central portion of the ground-floor of this front block contains the entrance-hall, with master's and porter's office, and, adjoining it, a committee-room and waiting-room for applicants for out-door relief.

The buildings in the central block contain accommodation for fourteen paupers of each sex, and there are two padded rooms for dangerous lunatics. A small number of paupers will thus always be kept at the buildings and will be employed about the premises performing the usual cleaning and such like duties.

The buildings in the rear consist of a kitchen, with larders and stores, a laundry, disinfecting closet, and other offices.

Stabling, with large ambulance accommodation, is provided at one end of the site left of the entrance.

The architects are Messrs. Saxon Snell & Sons; the builders are Messrs. Mowlem & Co. The heating works are executed by Messrs. Berry & Son; the water supply by Messrs. Potter & Sons; the cooking apparatus by Messrs. Benham & Sons; the gasfittings by Messrs. May Brothers; the padded rooms by Messrs. Cooper & Holt; and the stable fittings by Messrs. Barton & Co.

The contract for the erection of the buildings, including engineering work and all fittings, amounts to 20,900.

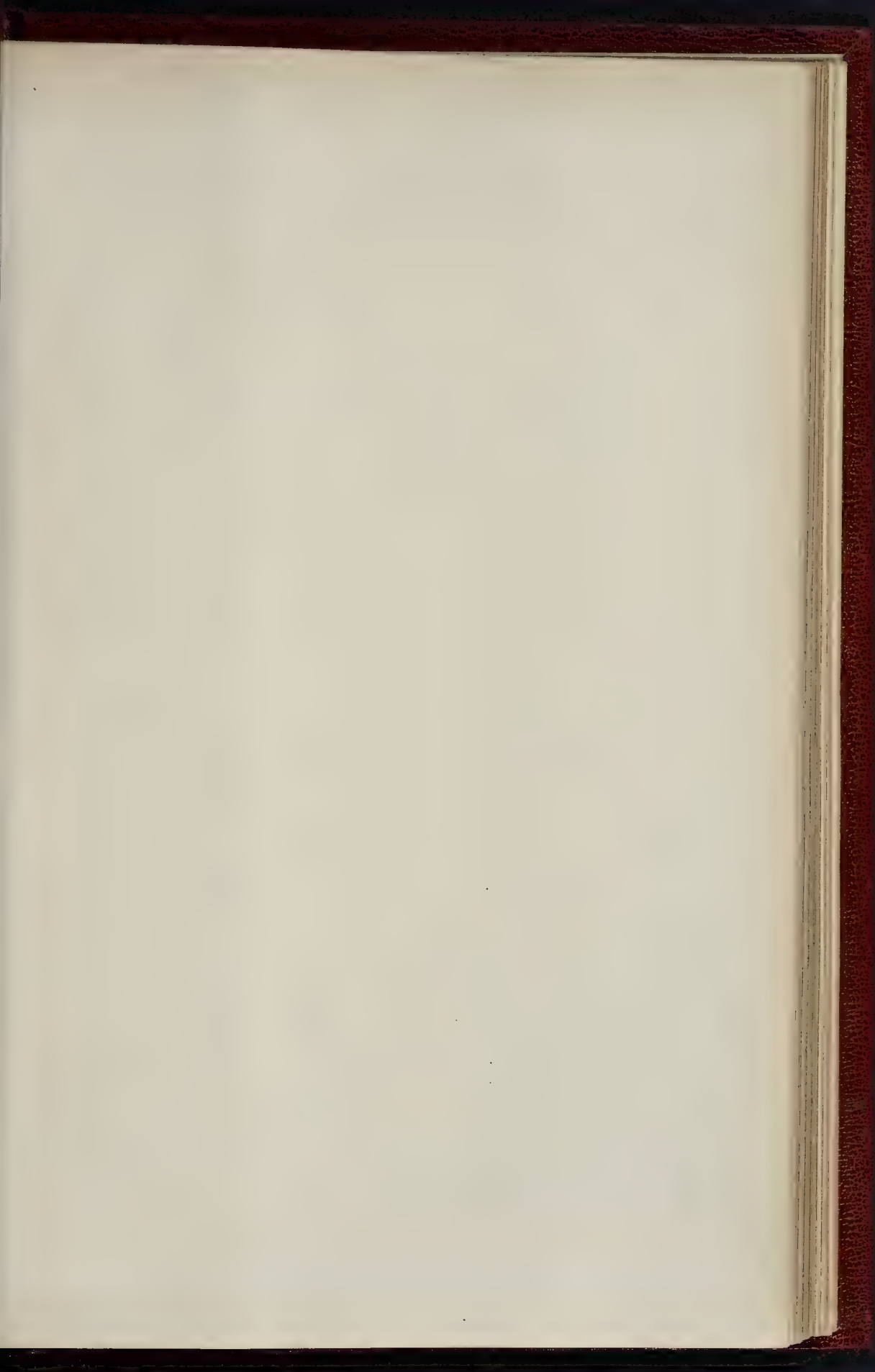
GATES, WIRRAL CHILDREN'S HOSPITAL, BIRKENHEAD.

THESE gates are constructed of wrought-iron, with the exception of the flowers and letters W. O. H., which are in real bronze. The workmanship is exceedingly good, and the design has been most faithfully carried out. They were the gift of Mrs. Dowie, of Cloughton, in memory of her husband, and were executed by Messrs. Bennett Bros., of Liverpool.

Mr. John Clarke, 19, Castle-street, Liverpool, was the architect of the building, and the gates were carried out under his immediate superintendence.

Temple of Diana at Ephesus.—In reference to the remarks on this in our last (p. 692), Mr. Jas. Fergusson writes to say that it would have been impossible to give data, references, and explanations on the drawing, and that his paper in the Transactions of the Institute of Architects, vol. for 1882-3, pp. 147 to 161, must be taken as the data for the design, which is practically the outcome of the paper.

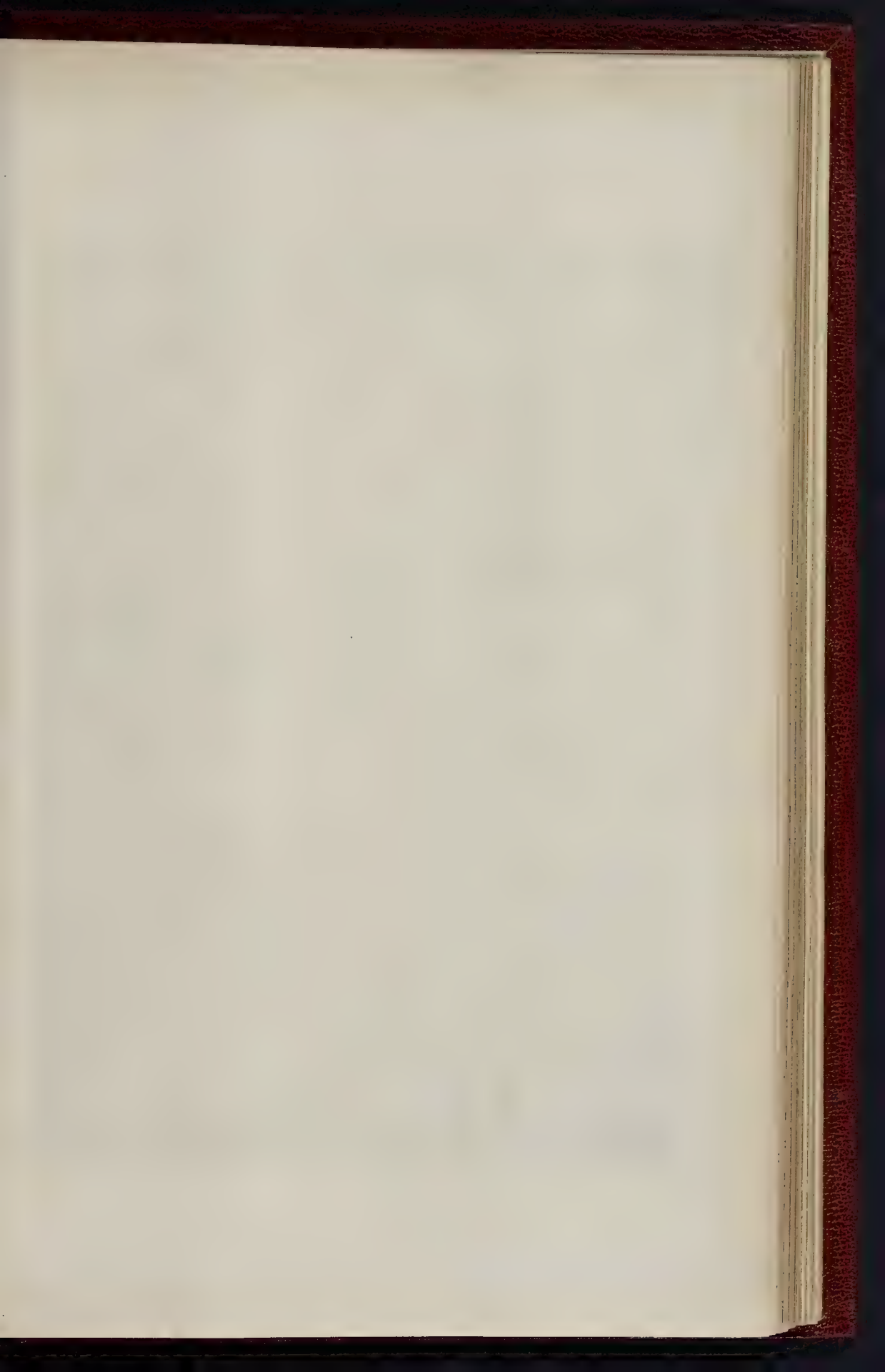
* See *Builder*, p. 728, ante.





THE ALLIANCE BANK, REGENT STREET.

MR. FREDERICK PINCHES, A.R.I.B.A.
Architect.



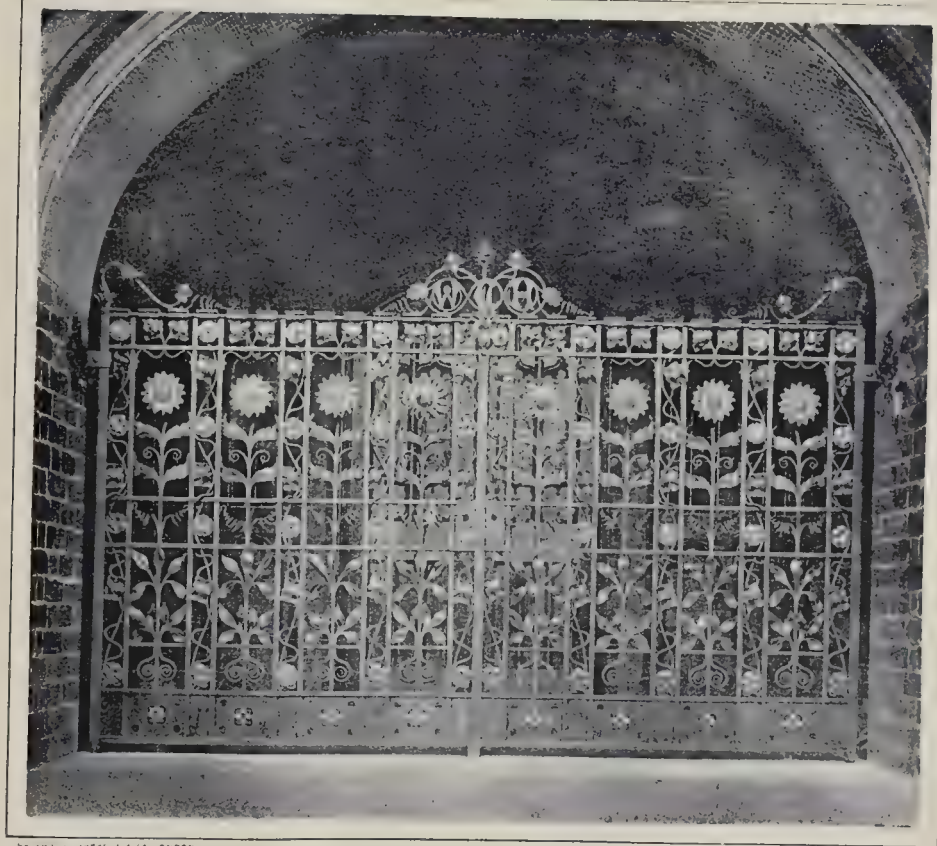


NEW MUSEUM OF ANTIQUE SCULPTURE, CAMBRIDGE

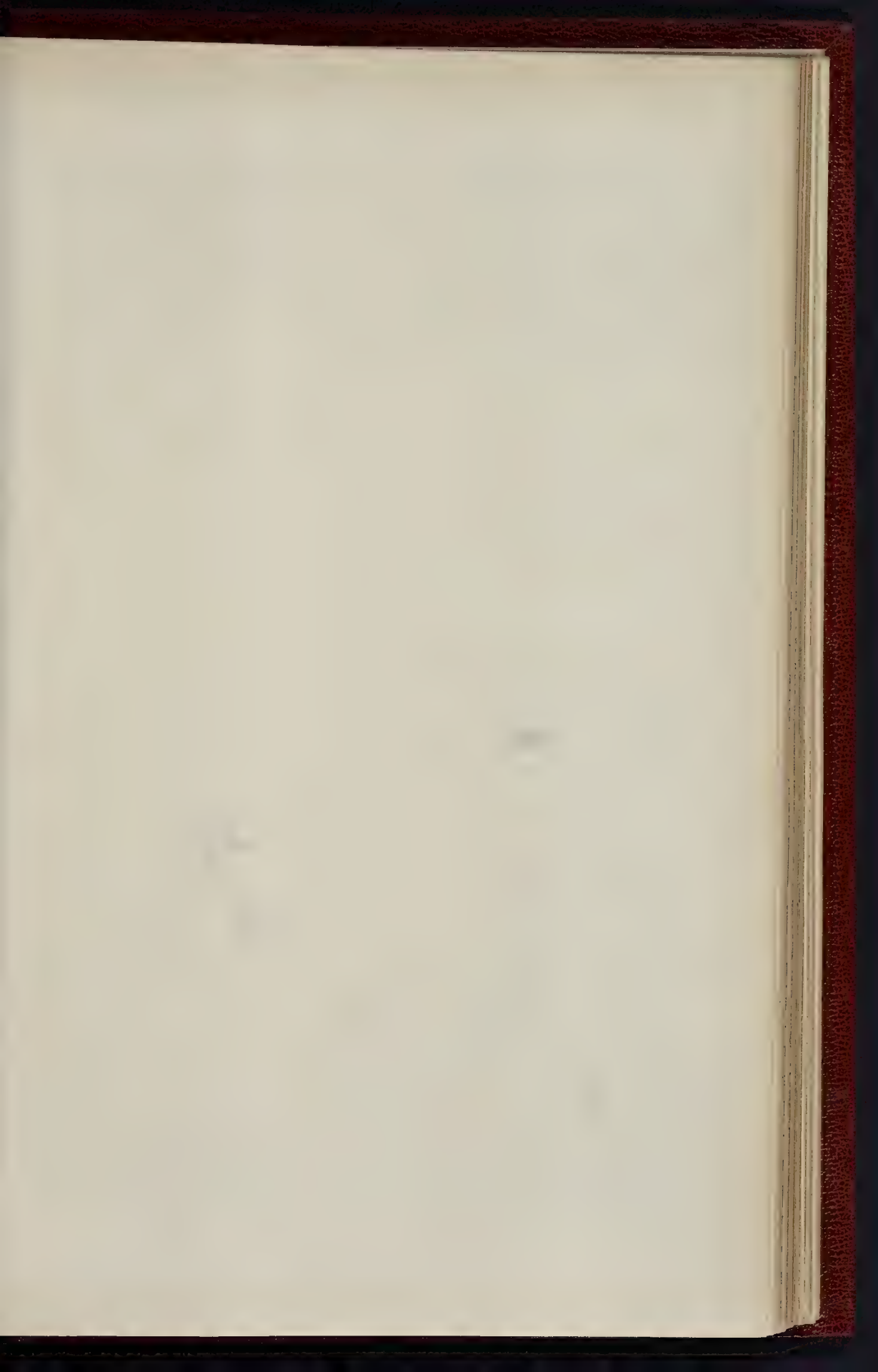
View from centre Gallery, looking into Early Greek Gallery



CARVED OAK DOOR-HEAD, FOR BILLIARD-ROOM, WORTLEY HALL.
EXECUTED AT THE SCHOOL OF ART WOOD-CARVING, KENSINGTON).



WROUGHT-IRON GATES, WIRRAL CHILDREN'S HOSPITAL, BIRKENHEAD.
MR. JOHN CLARKE, ARCHITECT.



THE BUILDER. MAY 24, 1904



NO. 21070. SHAW & CO. LONDON

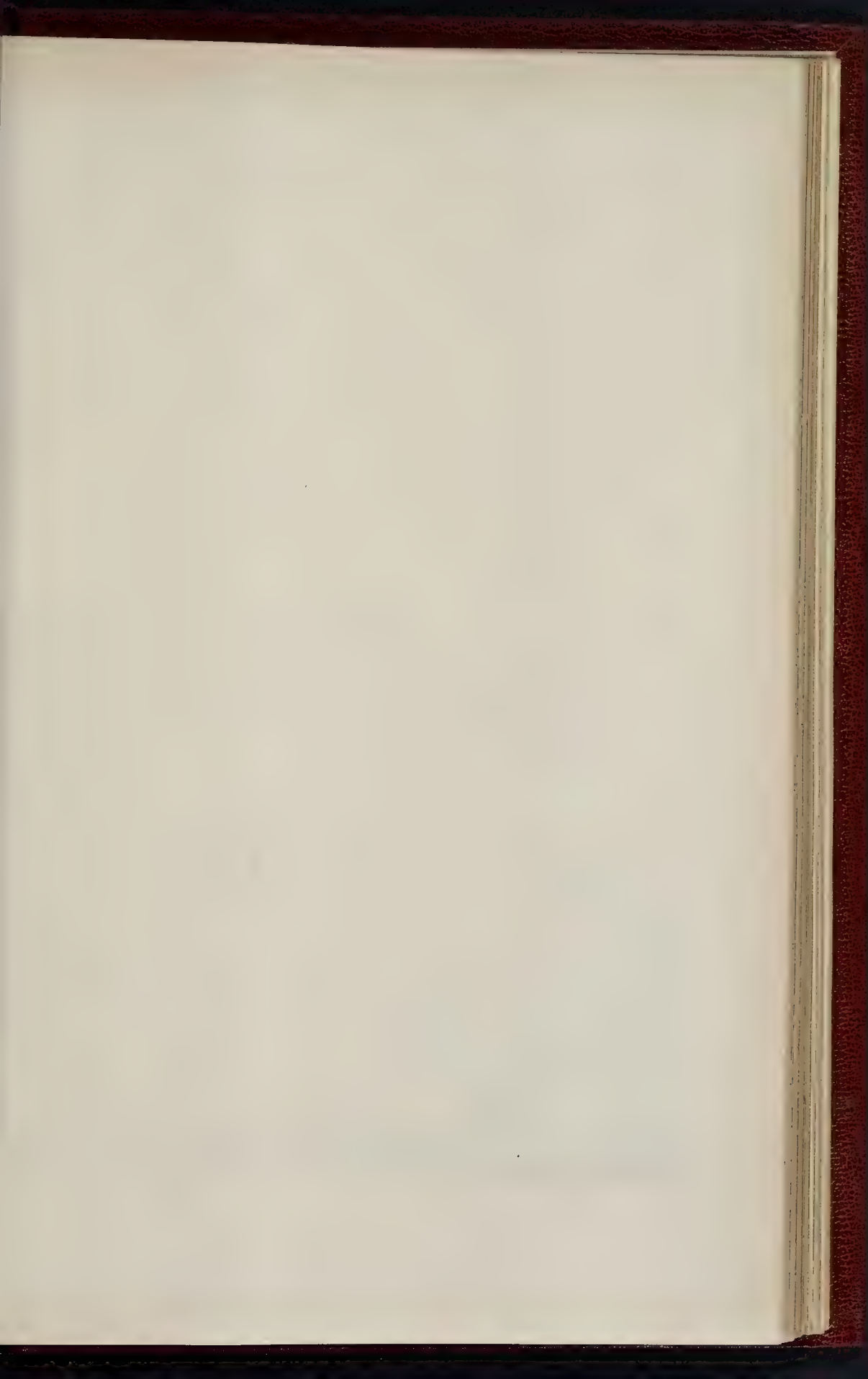
NEW MUSEUM OF ANTIQUE SCULPTURE, CAMBRIDGE.

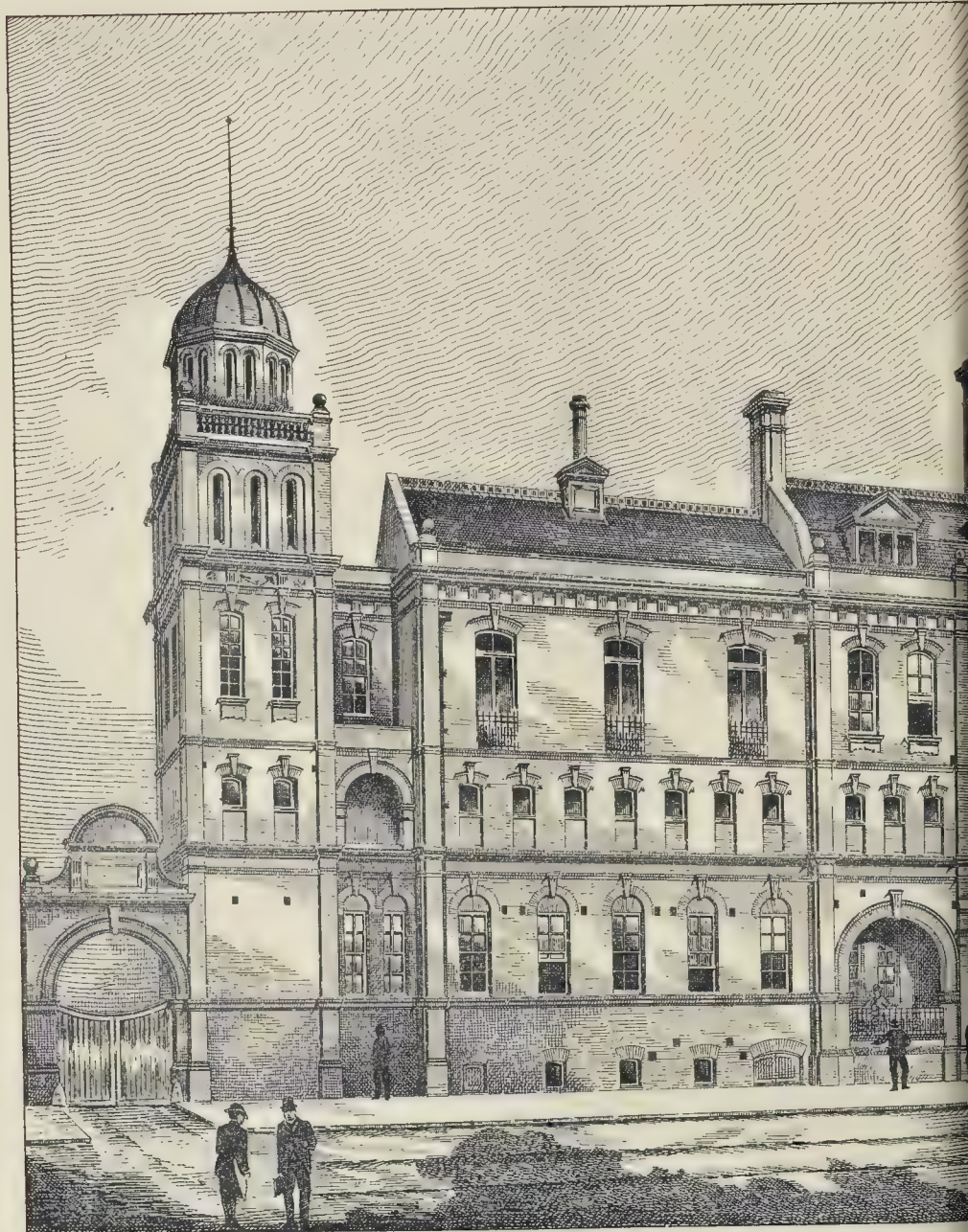
II.—View across the Galleries, from the Early Greek Room.



PHOTO, SPENCER & CO. LONDON.

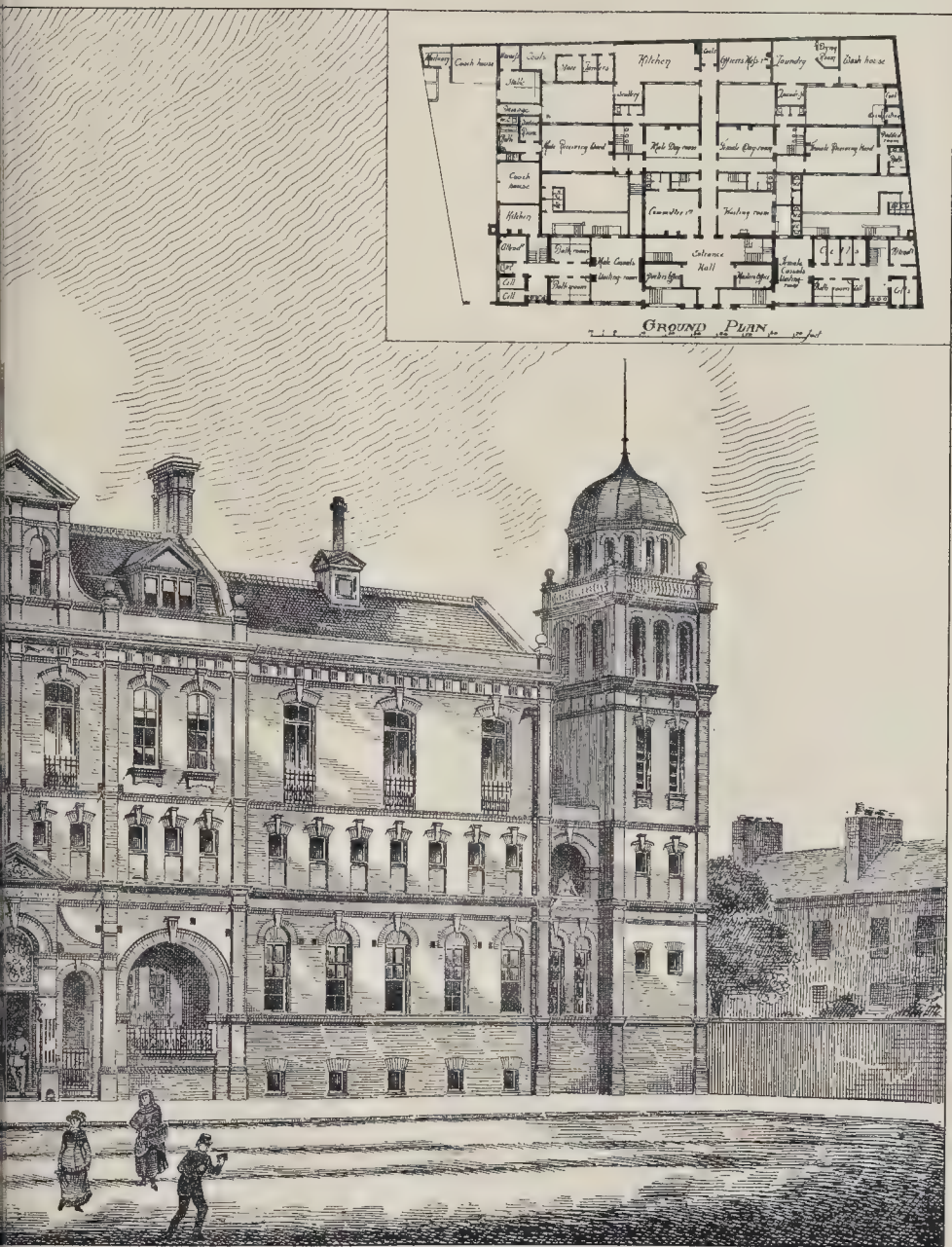
NEW MUSEUM OF ANTIQUE SCULPTURE, CAMBRIDGE.
III.—Upper portion of centre Gallery (later Greek Work).





© F. and J. W. & Co. Engrs.

RECEIVING HOUSE AND CAS
For the Guardians of



8 Castle St. Holborn London E.C.

DS, WALLIS' YARD, PIMLICO,

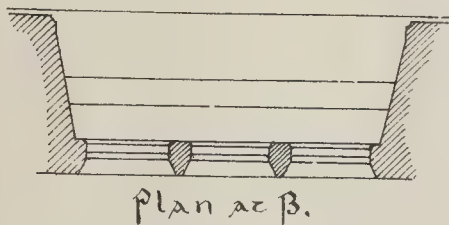
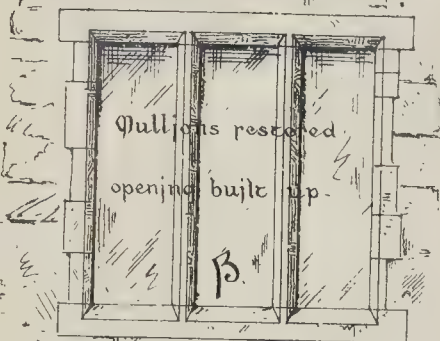
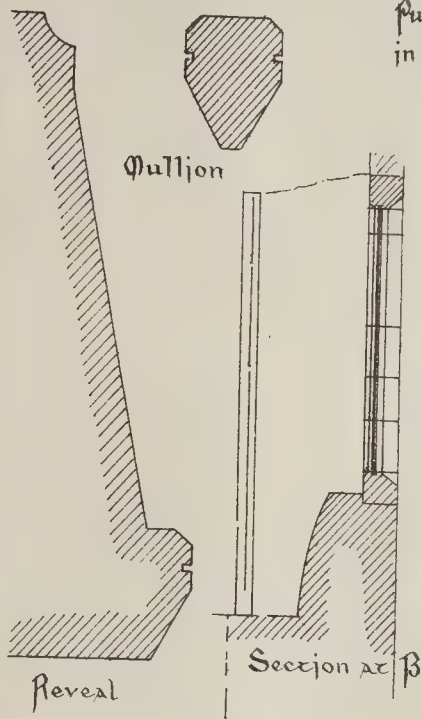
St. George's Union.

MESSRS H. SAXON SNELL & SON, ARCHITECTS

Details 1" scale

Remains of Winchester Palace

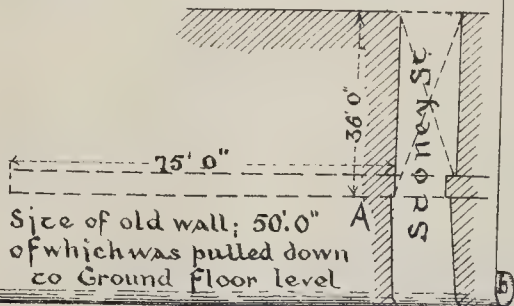
Pulled down 1881; was situated in the N.E. corner of the Clink Liberty



Key Plan

30' 0" = 1"

clink st



DRAWN BY

C. N. M^cINTYRE NORTH,

ARCHITECT & SURVEYOR,

15. Boro High Street.

S.E.

THE NEW MUSEUM OF SCULPTURE,
CAMBRIDGE.

The three views which we give of the interior of this museum derive their chief interest from the sculpture, which is fully treated of in our leading article of this week; but the points of view have been selected so as to include also such points of architectural effect as could be realised in a building in which economy was a necessary condition. As described in our former article,* the sculpture rooms form three parallel galleries, the centre one running the whole length of the building, the other two shorter. Plate I. is from the middle portion of the centre gallery, looking through the little columned vestibule which connects it with the right-hand gallery. Plate II. gives the view from near the middle of the right-hand gallery, looking across the building, through the two doors of inter-communication, towards the Roman room. Plate III. is from nearly the same position as Plate I., but looking up the centre gallery, to where a columned apse closes the vista.

CARVED OAK DOOR-HEAD,
WORTLEY HALL.

EXECUTED BY STUDENTS OF THE SCHOOL OF ART
WOOD-CARVING, KENSINGTON.

The students of the School of Art Wood-carving, at the Albert Hall, have just finished two carved lunettes in oak for the architraves or overdoors of Lord Wharfedale's billiard-room at Wortley Hall, one of which we illustrate in this number. The panels were designed by Mr. John Fisher, of the National Art-Training School, and late of the Sheffield School of Art, and were approved by Mr. E. J. Poynter, R.A., who designed the rest of the decoration (See *Builder*, Jan. 5th). The designs have been carried out in the wood by Miss M. E. Reeks, Miss H. E. Wahab, Mr. J. Fourneaux, and Mr. G. Hurst.

We may add that the principal aim of this school is to cultivate the taste for wood-carving, and to produce it at a moderate cost, and as the committee are anxious to revive the architectural wood-carving so prevalent in the nineteenth century in England, the School would gladly co-operate with any architect for this purpose. The School is open to amateurs as well as to those making wood-carving a profession, and to ladies as well as gentlemen.

REMAINS OF WINCHESTER PALACE.

In Mr. Brewer's view of Old London Bridge, which we published a fortnight since, Winchester Palace formed a prominent object in the foreground. We now reproduce a drawing of a fragment of the palace which still remained two or three years ago,—the detail of a window and archway, which were discovered in pulling down a portion of the old walling of the palace. The wall had for many years formed the party-wall between Mr. E. Gripper's mills and a shed on the southward, and in consequence of the necessity of rebuilding the greater portion of the wall had to be taken down to the level of the warehouse floor.

The portion of the wall, as shown on the key-plan (in length, 75 ft.), was situate on the west of Stony-street, and 36 ft. from Clink-street. The jamb, head, and sill of the window were in a fair state of preservation, but portions of the mullions only remained. Westward of the remains shown in the illustration were another four-centred archway and some stones which had evidently formed part of a doorway.

In digging for the foundation of the piers of the new wall, which was built in the old foundation, the crown of a sewer or subway was broken into, which, to all appearance, was much of the same size and character as that still (or until lately) to be seen near some houses in the Borough Market; this subway, however, being full of semi-liquid mud, its extent and direction could not be ascertained. Embedded in the wall, at the first-floor level, was a handful of Samian ware, which had evidently been broken up and thrown in during the building of the wall. This illustration is one of a series of sketches and notes of objects of interest in Southwark and Rochester, made and collected by Mr. C. N. McIntyre North during the last year and twenty years.

THE ARCHITECTURAL ASSOCIATION.
VISIT TO NO. 2, KENSINGTON COURT.

The members of the Architectural Association made their ninth and last Saturday afternoon visit this session, on the 17th inst., to No. 2, Kensington Court. Peter Cunningham says,—"Kensington, a village, a mile and a half from Hyde Park Corner." In front of the house visited last Saturday stands the milestone recording this fact. The house is situated in the High-street, and immediately opposite Kensington Palace. It is erected on a freehold plot of ground, having a frontage of 26 ft. 6 in. by a depth of 100 ft., at the junction of the new roadway to the Kensington Court Estate. Our readers will remember that the Association visited other houses on this estate recently, as recorded in the *Builder* of the 26th ult. No. 2, Kensington Court is a house of somewhat larger dimensions, and is being erected for Mr. A. Riley, of 32, Queen's-gardens, Hyde Park, from designs and under the superintendence of Mr. T. Graham Jackson, M.A., architect, at a cost of 7,800l. Mr. A. Estcourt, of Gloucester, is the contractor, and Mr. R. Edwards is the clerk of the works, by whom the drawings were received. After inspecting the visitors, the members, who were headed by Mr. Cole A. Adams, the President, and Mr. H. D. Appleton, one of the honorary secretaries, proceeded to view the house. Mr. Edwards said it was commenced in March, 1883, and is to be completed in three months from this date.

Besides the basement the house contains five stories, including an attic. In the basement are the servants' hall, housekeeper's room, butler's pantry, kitchen, scullery, and four large coal-vaults under pavement. The basement occupies the whole of the site. The ground floor consists of the library, dining-room, study, oratory, and entrance-hall. The first floor contains the drawing-room, large sitting-room, principal bedroom, and a spacious landing on the stairs overlooking a covered balcony on the western side. The upper floors contain bedrooms, bath-rooms, closets, &c. The treads, risers, ornamental balusters and handrail of the principal staircase from ground to second floor are constructed of oak; the upper flights are in painted deal, with turned balusters and polished oak rail. There is also a stone staircase from basement to the second floor. The front elevations are built of red brick facings and terra-cotta dressings, with Portland stone dressings for all gables and wall copings, finials and corbels. The balcony landings are from Castle Hill, Scotland. Messrs. Doulton, of Lambeth, supplied the terra-cotta dressings; and Messrs. Farmer & Brindley executed the whole of the modelling for the terra-cotta enrichments, and this firm has also completed all the carved work in oak and deal throughout. Oak wainscoting is used in the drawing and dining-rooms; the oak chimney-pieces in these rooms are of good design. The other principal rooms, including the study and the sitting-room on the second floor, will have deal wainscoting and chimney-pieces of good design, all to be painted. Our observations as to the sanitary arrangements and drainage of this estate, as described in the *Builder* of the 26th ult. also apply to this house, it being drained into the new sewer beneath the subway on the estate. *Appropos* of subways a fresh and powerful argument has recently arisen in this parish for extending their system, caused through the action just concluded in the Court of Queen's Bench,—the "Gaslight and Coke Company v. St. Mary Abbott's Kensington."

NO. 1, KENSINGTON-COURT.

The members, conducted by their president and hon. secretary, subsequently visited this house, where they were received by Mr. William McGill, clerk of the works, and Mr. Joseph Moth, foreman to Messrs. Holland & Hannen, the contractors. The house and premises contain twice the area of No. 2 (the one just described), the plot of land having a frontage to the high street of 53 ft. 6 in. by a depth of 100 ft., and was originally intended for two houses, but was purchased by Mrs. Lucena, who has thereon erected one large house from designs by Mr. J. J. Stevenson, architect. The ground-floor has a dining-room 24 ft. by 20 ft.; library 20 ft. by 12 ft. 9 in.; morning-room, lavatory, and conveniences. To the rear is a coach-house and stabling for six horses, with coachman's rooms and lofts over. The arrange-

ments in the basement are similar to those described in the adjoining house. The first-floor contains a large drawing-room 33 ft. 6 in. by 20 ft., boudoir 20 ft. by 16 ft. 6 in., and principal bed-room and dressing-room. On the second, third, and attic floors are bed-rooms, &c. Over the morning-room, &c., on a mezzanine floor is a fine billiard-room, 27 ft. by 19 ft., lighted from the top by a lantern skylight and by a large bay window. The principal roof timbers are exposed, and are of a dark-stained deal. All the lead lights throughout are manufactured and supplied by the contractors, Messrs. Holland & Hannen.

The whole of the woodwork to the principal staircase is of pitch-pine, with mahogany hand-rail. There is also a stone staircase from basement to the second-floor. The flooring to the entrance-hall, drawing-room, and boudoir are executed in parquetry by Mr. James F. Ebner, of Clerkenwell-road. The flooring in the other rooms on the ground and first floors is executed in pitch-pine. The elevation has red brick facings and terra-cotta dressings. This house is drained into a sewer specially constructed in the High-street at the cost of Mrs. Lucena. Both these houses may be said to be of the free Classic or Queen Anne style, modernised.

BUILDERS' BENEVOLENT INSTITUTION.

An election of four pensioners on the funds of this institution was held at Willis's Rooms, St. James's, on Thursday last, Mr. Henry G. Smith, president, in the chair. There were eleven candidates for the four vacancies—viz., nine men and two women. The poll was open from two to four p.m. The scrutineers, Messrs. Thomas Stirling and T. F. Rider, announced the results of the polling to be as follows, viz.:—William Mansell (fourth application), 753 votes; William Voysey (third application), 837; William Humphrey (third application), 534; Matthew Harrison (second application), 164; Thomas T. Spradbury (second application), 526; John E. Biley, 35; George Shearing, 457; Kouben Hurron, 163; William Charles Allen, 699 (including 45 votes given to the candidate in respect of contributions to the funds of the Institution in the days of his prosperity); Lilius Greig (second application), 1,010; and Harriet Shapland, 53. The successful candidates were therefore declared to be William Mansell, William Voysey, T. T. Spradbury, and Lilius Greig. Among the friends of the Institution, other than those already named, who took part in the proceedings, were Messrs. T. G. Smith, F. Foxley, G. N. Watts, and — Russell. A vote of thanks to the chairman terminated the proceedings.

SURVEYORSHIP ITEMS.

Aberdeen.—One hundred and twenty applications were lodged for the appointment of Assistant Burgh Surveyor. The list of applicants was reduced by the Council's Finance committee, who examined the applications, to the following six gentlemen, viz., Messrs. James Bartie, of Selkirk; William Dyack, of Aberdeen; G. S. Hird, of Aberdeen; John Keith, of Leicester; Kenneth McRae, of Edinburgh; and Samuel Stead, of Bradford. At a meeting of the Town Council, held on the 19th inst., Mr. William Dyack was appointed to the vacant office. The salary is 200l. per annum.

Bethnal Green.—At a meeting of the Bethnal Green Vestry held on the 15th inst., Mr. Frederick William Barratt, Assistant Surveyor to the Board of Works for the Hackney District, was appointed Surveyor to the Vestry of Bethnal Green.

New Public Offices for Widnes.—The Widnes Local Board have (according to the *Liverpool Courier*) made a final selection from the sixteen designs sent in for the new public-offices. They offered premiums of 50l., 30l., and 20l. respectively for the three best designs, and architects from all parts of the country competed. The offices, which are to be built on the market-ground at a present expenditure of 3,000l., are to be made into a town-hall at some future period, and it was made a condition of the competition that the carrying out of this proposed enlargement or development should be provided for. The first premium has been awarded to Messrs. F. & G. Holme, Liverpool; the second premium went to Mr. Henry Sheldrake, also of Liverpool; and the third to Mr. J. Candale, of Leamington. The successful designs are to remain open for inspection by the public for a week in the board-room, Alford-street.

* *Builder*, December 1, 1883.

A long discussion ensued, in which Mr. Lennox Browne, Mr. Orrock, Mr. Hatté, Mr. Cope, and Mr. Forbes Robertson took part. The lecture was spoken of in the highest terms. The lecturer's proposal for a school for colour, however, evoked considerable difference of opinion. A cordial vote of thanks was accorded to Mr. Storey for his lecture, in which the last-named speaker said the elements of beauty, humour, and order were to be found, combined with an admirably distinct delivery.

JOHN THORPE AND THE ENGLISH RENAISSANCE.

ARCHITECTURAL ASSOCIATION.

THE twelfth ordinary meeting for the present session of this Association was held on Friday, the 17th inst., Mr. Cole A. Adams (the president) in the chair.

The following new members were elected, viz., Messrs. E. W. Lewcock, W. Stirling, W. Alford, P. A. C. Wilkinson, E. J. Cooper, C. J. H. Cooper, C. Earp, and A. B. Walters.

The announcement that the President had been elected a member of the Council of the Institute was received with acclamation.

With regard to the Association Studentship, the following award was read:—

"We have the pleasure to inform you that we have awarded the Travelling Studentship to Mr. S. J. Oakshott, and the prize of five pounds to Mr. G. G. Woodward. We especially commend the drawings submitted by Messrs. W. H. Bidlake, G. G. Wallace, and E. H. Selby. There were nine competitors.—We are, &c. (signed) Thos. E. Colcutt, Charles Henman, jun., Thomas Batterbury."

The following nominations of officers for the next session were announced:—For president, Mr. Cole A. Adams; and for vice-presidents, Messrs. C. R. Pink and H. W. Pratt.

Mr. J. A. Gutch then read a paper entitled "John Thorpe and the English Renaissance."

The beginning of the sixteenth century witnessed a series of important events, which, though occurring in widely different spheres of action, may all be traced to one cause,—a re-awakening of mankind from the intellectual torpor in which it had been cast by the religious system of the Church of Rome. The backbone of that system was authority. To the officers of that church were confided the only keys that unlocked the mysteries of the universe; they alone were competent to explain the secrets of nature; they alone were able to introduce sinful man into the august presence of the supernatural powers. In their cloisters were immured the only students. Almost all knowledge, almost all chances of obtaining knowledge, lay with them. Outside their walls was an intellectual desert. Laymen were content with struggling for existence, either as potentates bent on buffeting each other, or as knightly followers of such potentates, with whom they were content to stand or fall; or else as serfs, with whom the struggle for life lost much of its charm. Laymen had neither time nor inclination to exercise their intellects; with them brute force was not only their empire in all disputes, but actually their boon companion.

Perhaps the most notable exception to this state of things was to be found in Italy, at the very doors of the Pope's own citadel. Italy was not so given over to strife as the rest of Europe seems to have been. Here men still retained some love of culture, and were content to match their wits against other men's swords. When, therefore, from innumerable causes, all working in the same direction, men began to awake from the lethargy of the Dark Ages, Italy was a fruitful soil, in which the new seed rapidly brought forth an abundant harvest.

This re-awakening of mankind, this new birth, has very happily been termed the Renaissance; but it would be a mistake to suppose that the term is applicable only to architecture, or even the arts. The Renaissance in art is only one phase of the great upheaval which affected the whole world, religious, literary, artistic, and political. In religion we call the same movement the Reformation. In English politics it found expression after a time in the great Rebellion. In literature, one result was Rabelais with his brutal scorn of bigotry and priestly pretensions; another was our own Shakespeare, the very embodiment of all that is purely and delightfully human.

England's part in this movement was directed to rendering assistance rather than taking the initiative. Both our Reformation and our Renaissance were imported, as printing was. With the Reformation, however, we need not

trouble ourselves farther. The Renaissance is more than enough to occupy our attention.

It has been observed how excellent a soil Italy offered for the fructification of the new seed. The harvest that ensued can only be fully appreciated by those who have visited the country. Out of her fulness she could well spare something to her neighbours, and we are not surprised to find Italian artists visiting and permanently residing in foreign lands. France, being nearer the source, was influenced first. England, however, was not long in catching the Italian fever. It affected everything,—modes of thought, modes of speech, writing, eating, dress, manners, building, gardening. Italy was the bourn whither all young men went on their travels, and they returned saturated with Italian ideas, which, when they came to express them in an English atmosphere, underwent a curious change. Roger Ascham, in his "Scholemaster," first published in 1570, laments this "Italianating" of English youth:—

"If Scylla drown him not" [he says of the young man who has gone to Italy] "Carybdis may fortune swallow him. Some Circes shall make him, of a plain English man, a right Italian. And at length to hell, or to some hellish place, is he likely to go; from whence is hard returning, although one Ulysses, and that by Pallas aid, and good council of Tiresias once escaped that horrible den of deadly darkness."

And further on he says:—

"If some yet do not well understand what is an Englishman Italianated, I will plainly tell him. He, that by living and travelling in Italy bringeth home into England out of Italy, the Religion, the learning, the policy, the experience, the manners of Italy."

And yet, in spite of Ascham's denunciations, he, in common with all of his age, was deeply infected with a spirit which, if not Italian, came to us primarily from Italy,—I mean the classical spirit which pervades the whole literature of that time. In another book of his, "Toxophilus" he says plainly that it would have been easier for him to have written it in Latin or Greek, and takes some credit to himself for having written, as he says, "this English matter in the English tongue, for English people." His great desire, moreover, was to see English poetry written in hexameters instead of in rhymed lines. This experiment has been tried more than once, but success is impossible. The hexameter is not suited to the English tongue, and the fact of Ascham advocating it so strongly shows how thoroughly he was carried away by the tide of classical learning which overflowed all Europe.

I dwell at some length on the literature of that time because it seems to me to be very comparable to the contemporary architecture. There is, however, this great difference; that although both of them abounded with classic forms, literature gradually freed itself from them, and became purely English, while architecture succumbed, and became less and less English with every succeeding decade.

Perhaps the most characteristic book of that time is the "Euphues" of Lyly, and a very dull book it seems to be. However, it abounds with classical allusions. Everything is measured with a classical rule. You are pelted with the ancients, their customs, their superstitions, their excellences from one end of the book to the other. You cannot read a page without coming across them, their gods, their philosophers, or their poets. And the same sort of thing is found in the architecture of the time; Latin inscriptions, Latin epitaphs, statues of the twelve worthies, busts of Roman poets, Greek philosophers, heathen gods, nymphs, and satyrs. And yet, with all this, the books are English; and so are the buildings. Wollaton Hall is no more like the Château de Chambord, than Shakespeare's *Falstaff* is like Rabelais' *Panurge*.

It took about two generations to infect English architecture thoroughly with the Classic spirit. But by the time that wealthy Englishmen had made up their minds that they liked the Italian details, John Thorpe appeared upon the scene. He came at a very fortunate juncture for an architect. The times were settled. The old disputes which had convulsed England from the Tweed to the Exe were disposed of. The country gentlemen, whose houses had been their castles, found the old fortress arrangements ill-suited to the growing elegance and luxury of the age. They wanted new houses. The revenues of the dissolved monasteries furnished them with ample means. House-building became the rage. The fever seized on the whole nation, from the Lord Treasurer to "Mr. Johnson ye druggist," both of whom were clients of John Thorpe.

Some people are inclined to doubt whether Thorpe really was an architect, and to hold that he was merely an amateur who made sketches of existing work or of the large houses that were then being built; and it is not easy from his book alone to prove that they are wrong, for among the drawings is a plan of Henry VII.'s Chapel at Westminster, which, from anything it says, and did we not know otherwise, we might almost conclude to be as much his design as the others. However, I hope to satisfy you from more than one source that Thorpe was actually an architect.

Before proceeding to argue about the book, however, it may be as well to describe it.

It is a volume of folio size, some 17 in. by 12 in., consisting of sheets of thickish rough drawing paper, with a particular water-mark. The pages are used both back and front as though it had been bound before being used; but yet this clearly cannot have been the case, since some of the drawings go right down into the fold of the book, and have evidently been bound up after completion. In one case, however, a plan which covers two pages is stopped short of the crease or fold by a straight line, and continued on the opposite page from a similar line, thus avoiding the burying of any part in the fold. The drawings, generally speaking, are in ink over pencil lines, and in many cases the pencil lines have not been rubbed out. Some few are in pencil only, but these generally are slight and rough. There are many more plans than elevations, and there is only one section. There are a few pages of full-size mouldings, one of the Five Orders, carefully drawn with proportional lines, one or two of sketches for ornament, and one with elaborate instructions how to put a building into perspective,—instructions which Thorpe, for his perspectives are far from correct. The drawings seem to have been ruled in with a common pen, and probably with a rolling ruler. Some of the plans are very neatly done, most of them are tolerable, some are bad. The elevations, or "Uprights" as he calls them, are generally indifferent; they combine the geometrical and the perspective treatment, not altogether with success. If these are the best drawings turned out from the leading office of the time, we may congratulate ourselves upon the advance made in architectural draughtsmanship since the Renaissance.

There are 282 pages in the book, some score of which, perhaps, are blank. More often than not there is one drawing to a page; perhaps the ground-plan on one page, and the upper plan on its opposite. But many of the designs have nothing but a ground-plan; so, whatever the book is, whether a note-book or a collection of original designs, it is not a complete account of the buildings shown. There are about 140 different buildings illustrated, of which some fifty occupy two or more pages. Only fifty-five of the 140 are either identified or have a title put on them by Thorpe. There remain, therefore some eighty-five, of which we know absolutely nothing, except that they appear in this book. If we could identify these eighty-five we might perhaps get to know something more about the architect himself. Of this large number a few are clearly only freaks of design, and were never intended to be executed. The bulk, however, appear to be *bona fide* designs, intended to be carried out. I have roughly classified them thus:—

Fifteen are sketches not likely to throw any light on the subject.

Twenty are unfinished drawings, and may either be designs begun but abandoned or designs in the midst of being worked out. Some may be identifiable, perhaps, but many of them are hopeless.

There remain forty-seven, of which nine are of half-time; all the rest, except three, are finished designs of large houses, some of them of very great extent; and I have no doubt that, did we possess plans of the principal Elizabethan houses still existing we could track many of them home to John Thorpe's book. Doubtless not a few of the houses there shown have been destroyed, but some of them certainly ought to be identified; and, if any one possessed any plans likely to be of use, I should be very glad if they would allow me to compare them with Thorpe's, or else do so themselves and acquaint me with the result.

Having learned something of the book the question arises,—What do we know about the man? and the answer is,—almost nothing.

Who was John Thorpe? where was he born? where did he die? how long did he live? To these questions we can give no answer.

From three sources only do we know anything about him; from his book, from a plan made by him and preserved in the Record Office among the State papers; and from a payment to him recorded in the "Issues of the Exchequer."

The plan is labelled "Eltham, 1590," and is a ground-plan of the royal palace there. It has no special title on it to indicate for what purpose it was made, but, judging from its being among the State records, and from the description of some of the rooms,—"decayed lodgings," and "the store-house for the works,"—it seems to be a plan of the premises made for the purpose of enlarging or repairing them. In the middle of the plan is written, in the handwriting rendered familiar by frequent examinations of his book—"exco. p. Jo. Thorpe,"—which fixes its author beyond a doubt.

The other reference to Thorpe occurs, as stated above, in the "Issues of the Exchequer" in the reign of James I., and it is as follows:—

John Thorpe; 4th of June, 1606. More to him for his charges in taking the survey of the house and lands by plots as Holdeby with the several rates and values of both particularly, with his own pains, and three others a long time employed in drawing down and writing fair the plots of that son of Amphil house, and the Earl of Salisbury's, by commandment of the Lord Treasurer of England, dated the last day of May 1606 ... 70l. 8s. 6d.

A plan of Amphil occurs in Thorpe's book, but none of Holdenby or the Earl of Salisbury's, so far as the plans are identified. We may, however, safely conclude that the above payment was made to the John Thorpe whom we already know, and that he was, in the words of Robert Smythson's epitaph, "Architector and Surveyor."

Examining the various plans in the book by the light thus obtained, it is not difficult to believe that the bulk of them are designs in course of being worked out. Some of them are still half in pencil; not unfrequently the upper plan does not correspond exactly with the ground-plan, but includes fresh features, often adopted in the actual building, as at Kirby. There certainly are often puzzling notes, as for instance, "Kytchen, cellar under," or "Hall, great chamber over," or "Gallery above, all this length," as though referring to something actually built. But in one case such a taste (referring to the floor over) is on the ground plan, when the upper plan is by its side, and these notes are just as likely to be memoranda made in designing, as they are to be items of information about completed work.

Some of the plans actually state that Thorpe was engaged upon the buildings. For instance, "Sir Walter Coop at Kensington, pfected p. me J.T." "Queene Mother's howse, falor St. Jamin alla Paree, alther p. Jo. Thorpe" or "Amphil enlarged p. Jo. Thorpe." Again, on one elevation beneath three types of windows is written "which of these three is best." All of which tends to show that Thorpe was actually a practicing architect, and that here we have his work in the process of design.

Take Wollaton, again. Thorpe gives a plan and half a perspective or elevation, and neither of these agrees with the building as executed, nor could the discrepancies either have arisen since thorough alterations, or be the result of careless measuring and drawing, for there is a basement in execution which Thorpe does not show, and the ornamental features are not carried out quite as he has drawn them. Among other things the pedestals of the pilasters have each of them a gondola or mooring ring worked in stone, a useless feature, imported bodily and barefaced from Italy. Curiously enough, on his drawing Thorpe has two treatments of these pedestals, as though for choice,—one is a raised panel, the other a gondola ring. Only on one supposition can these things be satisfactorily accounted for, and that is that in this book we have his preliminary sketch.

Some of the notes on the drawings are rather curious, and would lead to sad confusion in the present day if put on a working drawing and sent to the builder; for instance,—"Hall too long by 5 fo." "This front is drawn 10 fo. too narrow, not long enough." "This cort should be 88 fo. square" (when it scales 70 ft.); or, finally, "This parlor would have been wyder if the paper had suffered it." So that the only solution that really meets the case is the one just mentioned, that in this book we see Thorpe's brain at work.

That these are the working-drawings from which the houses were actually built I do not

believe. Several of the plans I have compared with the actual buildings; in all cases there are discrepancies more or less considerable between them. The main idea in each case has been carried out; even the main walls are built as drawn, but the internal arrangements frequently differ very much, and in essential features; that is to say, the differences cannot have arisen entirely from subsequent alterations. In proof of this I would cite Burleigh House (fol. 57, 58), Kirby Hall (fol. 137, 138, 139, 140), Slougham Place (fol. 239, 240), and Lyveden New Building (fol. 215, 216). Then, as already observed, there are many more ground-plans than upper plans; there are only some thirty elevations out of about two hundred drawings, and only one section in the whole book.

Another very important feature is this,—that some of the drawings are copied from a French book on architecture by Jacques Androult du Cerceau, published in 1576. The two books (Androult's and Thorpe's) being in different museums, it is impossible to collate them; but, speaking from memory fresh from the subject, three of Androult du Cerceau's drawings will be found copied in Thorpe's book, viz., the theatre at St. Germain, plan and elevation; the plan of the Château de Madrid, Paris; and the plan of the Château Anssi le Franc. They have quite a distinct appearance, and differ from the bulk of Thorpe's drawings, but a close examination of the two books will go far to show that the Englishman was largely infected with the Frenchman's love of quaint planning. In fact, the quaintest of Thorpe's plans have a French origin.

Having thus come to a conclusion respecting the character of the book itself, let us look a little further at its author, and then at the general character of his work.

In the first place, then, his book covers a large number of years. The earliest date written in it is 1570, in a note on the ground-plan of Kirby, "Whereof I layd ye first stone A° 1570." This agrees with the date of 1572 actually on the parapet. The latest date is 1621, on the plan of the Queen-Mother's howse, "altered p. me, Jo. Thorpe." The period thus covered is fifty-one years, and is practically coincident with the beginning and end of what we call the Elizabethan and Jacobean styles. There are a few intermediate dates as 1596, 1600, in which year he was in Paris, as he has plans of "Mounseur Jammet his howse in Paris," and of "St. Jermin's House, V leagues from Paris." The only other date is 1606, on a house for Sir Wm. Haseridge. But apart from these dates which are actually written with his own hand, we can date many of his buildings from other sources, and thereby obtain a tolerably close sequence, commencing with 1560 and ending in 1621.

Several of the drawings, however, especially the earlier ones, are evidently taken from buildings already erected, and the first identified house which we can suppose to have been designed by him seems to be Copt Hall, in Essex, the date of which is given as 1564 to 1567.

The whole book is devoted to houses. The only exception is Henry VII.'s Chapel, and the commencement of what looks like the east end of a church or cathedral. Among the designs are included many of the very largest and stateliest structures of that age, as the following list will show:—

Theobalds, for Lord Burleigh.
Buckhurst House, Sussex, for the Earl of Dorset.
Loseley, near Guildford, Sir George More's.
Knowle, near Sevenoaks, for Lord Burkhurst.
Kirby Hall, Northamptonshire, for Sir Humfrey Stafford.
Burleigh, Juxta Stamford, for Lord Burleigh.
Wollaton, near Nottingham, for Sir Francis Willoughby.
Longford Castle, Wiltshire, for Sir Thomas Gorges.
Lyveden New Building, for Sir Thomas Tresham.
Audley End, Essex, for the Earl of Suffolk.
Holland House (enlargement), for Sir Walter Coop.
Aston Hall, Birmingham, for Sir Thomas Holt.
Somer Hill, near Tunbridge Wells, for Lord Clarickard.
Slougham Place, Sussex, for Sir Walter Covert.
Danvers House, Chelsea, for Sir John Danvers.

If we could identify others by the plans, we should be able to extend this list.*

THE GERMAN SYSTEM OF ARCHITECTURAL EDUCATION.

SIR,—I beg you to allow me space in your valuable journal to make a few remarks on a subject of much importance and in the interest of those who wish as correct information as possible.

Mr. Spiers says, in his paper read at the recent Conference of Architects [see *Builder*, p. 271, ante], "The German academies fail in art because they are linked with engineering instead of with painting and sculpture."

I have studied at the Royal Academy of Architecture at Dresden, under the late Professor Semper. There was no engineering taught, nor did any engineer study there; but the Academy of Architecture was with the Academy of Painting and Sculpture, under the same roof, at the Brühlische Terasse, surrounded by the ateliers of the eminent painters and sculptors, Professors Hübner, Rietschel, Rauch, and others, the students of the three sister arts studying and living in daily intercourse together from the beginning to the end of their career. There was no cramming by the copying of Schinkel's eternal design for ceilings, &c. Neither Professor Semper nor any one of his colleagues would have approved of that, although his works were in high estimation and of great value to the student as well as a guide to his travels.

Mr. Spiers says further on:—"Two other educational sources must here be noted,—1st, the meetings and classes of the Architectural Association, a society unique in its character, existing in no other country and in no other profession." During my stay in Germany, (1872-3) I attended many meetings of the Architectural Vereine at Berlin and Vienna, where the most eminent architects of the day regularly met with all the other members of the profession, as well as their assistants and the students, after they had passed a certain standard, where papers were read, designs exhibited, &c. Anything like it of equal advantage I know not of in England.

But there is one most important difference in the English and German systems which Mr. Spiers most unfortunately did not bring into consideration. In England the architect entrusts the execution of his works to a clerk of works, who, in most cases, is either a bricklayer, a mason, a carpenter, a surveyor's clerk, or a builder formerly in business; in Germany it is a *bauführer*, a man of considerable education, on the same road which the architect, his employer, has passed before him.

I fear I have been trespassing already on your valuable space, although there may be a great deal more to be said on so important a subject. I shall, however, be very glad to give any further information which may be required on the subject.

WM. CONRADI.

Brussels, May 19th, 1884.

P.S.—I know nothing of the Academy at Zürich, but it is no German academy; and if Mr. Harvey stigmatises it as a schoolboy system, it can have no resemblance to the German academies at Berlin, Dresden, Munich, Vienna, and others.

SEWER CONNEXIONS.

SIR,—Seeing a paragraph in connexion with the Health Exhibition in last week's *Builder* (p. 733), in which Mr. Cockrill, the borough surveyor of Great Yarmouth, takes credit for having invented a pipe-sewer junction block, I should like to be allowed to say that this contrivance can hardly be said to be the work of his mind, seeing that I brought out what I take to be, from the description, the selfsame thing in 1875. In that year I submitted a design to the late Mr. Morant, the borough engineer at Leeds, who at once saw the great advantage that would accrue from using them, and they have been used here ever since in all instances.

D. ALEXANDER.

Leeds, May 20, 1884.

Peterborough Cathedral.—We should have mentioned that the very accurate and careful drawing of part of the cathedral, reproduced in our last number, was made from measurement by Mr. Robert Garwood, who is, we are given to understand, one of the office staff of the contractors.

* The remainder in our next.

WATER SUPPLY AND ITS COST TO PRIVATE HOUSES.

SIR,—In view of the recent memorandum on water supply and its cost to private houses, may I ask through your columns a solution of the following inconsistency.

I have gauged my one cistern each morning immediately before the supply has begun to flow in, and find through fourteen days that I consume at the rate of 14,000 gallons annually. We are eight persons, all over fifteen years old, wash all linen at home fortnightly, and are as aquatic as possible in our bedrooms. But my rent is 45*l.*, with two water-closets, and, as the cistern is more than 10*ft.* above the road level (what has that to do with value?), I am charged 55*s.* yearly, or more like 4*s.* per 1,000 than the pence you name.

Is this right?

AN ORDINARY HOUSEHOLDER.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

May 9. 7,152, W. Sanderson and T. A. Moffit, Gateshead, Blind Furniture.—7,463, J. T. Eden, London, Combination Drain Tube.—7,464, J. T. Eden, London, Automatic Flushing-wheel Apparatus.—7,465, W. B. Dodd, Carlisle, Impervious Joint for Stoneware Pipes, &c.—7,464, A. B. Reck, Copenhagen, Heating, Exhausting Steam and Hot Water combined.—7,485, A. B. Reck, Copenhagen, Heating and Ventilating.—7,490, W. Clark, Brighton, Casting or Forming Ceilings, &c.—7,491, H. Stringer, Brighton, Chimney Pots.—7,493, J. B. Adams and T. Telford, Liverpool, Window-sashes.—7,507, H. Trotter, London, Water Waste-preventer and After pump connected for Water-closets.

May 10. 7,528, S. Turner, Barrow Haven, Roofing Tiles.—7,546, S. Pickersgill, Derby, Open Fire-grates or Stoves.

May 12. 7,601, T. C. Messner, Loughborough, Flushing Cisterns for Water-closets, &c.—7,610, G. H. Chubb, H. W. Chubb, and H. S. Ball, London, Door Locks or Latches.—7,613, J. L. Westland, New Brighton, Fire-escape.

May 13. 7,620, T. Abbott and M. Hawthornthwaite, Lancaster, Flushing Water-closets, &c.—7,622, A. W. Newton, Birkdale, Automatic Window.—7,632, T. W. Roberts and Yates, Haywood, & Co., Rotherham, Gill Stoves.—7,633, T. Smith, Brockley, and J. Drevitt, London, Window-shaking Preventers.—7,650, W. H. Luther, Glasgow, Astragals or Sash Bars.—7,660, W. A. Wyatt, Gosport, Sash-line Holder.—7,666, H. Doulton, London, Water-closet Fittings.—7,672, J. W. Brown, Leamington, Cooking-ranges.—7,675, R. Pringle, Blackheath, Cistern, &c.

May 14. 7,690, J. G. Connell, Glasgow, Double-valve Mechanism for Water-closets.—7,690, G. Candler, Maidstone, Construction of Conical and Pyramidal Roofs.—7,702, A. J. Boulle, London, Smoke-consuming Grate. Com. by P. Antoine, Daraucourt, France.—7,705, C. J. Burton, Deptford, Ranges.—7,723, P. Dalton, London, Hot-water Apparatus for Warming Buildings, &c.

May 15. 7,730, A. B. Brady, Maldon, Sewer Ventilator and Manhole Cover.—7,731, A. Purkess, Andover, Earth Closet Apparatus.—7,748, E. B. M. Bond, London, Sash-fasteners.—7,763, T. L. Watson, Glasgow, Drain-pipes.—7,767, T. Prost, Adelaide, South Australia, Exhaust Ventilators.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending May 17, 1884.

4,546, G. F. Harrington, Ryde, Ventilation. (Sept. 21, '83. Price 2*l.*)

There is an improvement on Patent No. 387 of 1883, in adapting the cowls to ventilate buildings, &c., by fitting vanes thereon to make them face the wind. (*Pro. Pro.*)

4,618, H. C. Paterson, Glasgow, Ventilating. (Sept. 28, '83, 2*d.*)

Communicating with and above the room to be ventilated is a chamber, whose sides are made with louvers, &c., and a current of air from the room is induced by jets of steam or air forced into the chamber. (*Pro. Pro.*)

4,634, A. J. Boulle, London, Ventilating Apparatus. Com. by L. J. Wing, New York, U.S.A. (Oct. 2, '83, 6*d.*)

In a casting is mounted a fan, the blades of which are curved in cross section, and their pitch increases towards their ends. They are mounted on the shaft, so that they can be adjusted, whereby the pitch can be altered or reversed to make it either an exhaust or a forcing fan.

5,584, E. M. Wood, Natick, U.S.A., Greenhouses. (Dec. 28, '83, 6*d.*)

The roofs consist of a series of glazed sashes, and the sashes in one row are pivoted at their centres on a rocking shaft common to them all, whereby they can all be opened simultaneously.

Employers' Liability Act.—Working men who are subject to danger from accidents in the course of their ordinary work will do well to purchase, for one penny, the pamphlet on this subject published by Mr. G. Howe, giving the text of the Act and plain directions what to do in case of accident; "what to claim, when to claim, and how to claim."

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

MEETINGS.

SATURDAY, MAY 24.

Edinburgh Architectural Association.—Excursion to the Forth Bridge Works, and to Queensberry Church, Dalmeny House, &c.

MONDAY, MAY 26.

Surveyors' Institution.—(1) Annual General Meeting and Distribution of Prizes. 3 p.m. (2) Annual Dinner (at Holborn Restaurant, Venetian Saloon). 6 p.m. (3) *Society of Arts*.—Prof. W. Noel Hartley on "Fermentation and Distillation." (III.) 8 p.m.

TUESDAY, MAY 27.

Institution of Civil Engineers.—Mr. G. H. Stayton, Assoc. Mem. Inst. C.E., on "Wood Pavement in the Metropolis." 8 p.m.

Birmingham Architectural Association.—Mr. J. King James on "Architectural Perspective."

St. Paul's Ecclesiastical Society.—Mr. J. D. Sedding on "Modern Ecclesiastical Art." 7.40 p.m.

Anthropological Institute.—(1) Mr. Theodore Bent on "Remains from Cemeteries in the Island of Antiparos." (2) Mr. H. O. Forbes on "The Ko-joes of Sumatra." (3) Dr. J. G. Garson "On the Osteology of the Koebos of Sumatra." 8 p.m.

WEDNESDAY, MAY 28.

British Museum (Anglo-Saxon Room).—Mr. J. F. Rodgetts on "Early English or Anglo-Saxon Antiquities." (VI.) The Coin, 2 p.m.

Society of Arts.—Mr. J. Probert on "Primary Batteries for Electric Lighting." 8 p.m.

THURSDAY, MAY 29.

Society of Antiquaries.—(1) Dr. Birch on "A Bronze Sella Pretoria from Cairo." (2) Mr. W. H. St. John Hope on "The Corporal's Vases of the City of Rochester." (3) Mr. Edwin Freshfield "On the Palace of the Greek Emperors of Nicaea at Nympha." 8.30 p.m.

Institution of Civil Engineers.—President's Conversation at the South Kensington Museum. 9 to 12 p.m.

Society for the Encouragement of the Fine Arts.—Third Conversation, at the Galleries of the Royal Institute of Painters in Water Colours. 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Dr. William Ramsay on "Some Economical Processes connected with the Woolen Industry." 8 p.m.

Royal Institution.—Professor Dewar on "Flame and Oxidation." (VI.) 8 p.m.

Edinburgh Architectural Association.—Mr. David MacGibbon, President, on "Scottish Castles and Houses of the Fifteenth, Sixteenth, and Seventeenth Centuries."

FRIDAY, MAY 31.

Architectural Association.—Mr. C. R. Pink on "Heraldry." 7.30 p.m.

Society of Arts (Indian Section).—Mr. C. Pardon Clarke, C.I.E., on "Street Architecture in India." 8 p.m.

Royal Institution.—Mons. E. Mascart, Professeur au College de France, "Sur les Couleurs" (in French). 8 p.m.

Miscellaneous.

Large Sales of Suburban Building Land.

There were several sales of suburban building land in the vicinity of the metropolis at the Auction Mart last week. Messrs. Baker & Sons offered for sale a freehold building estate in Hammersmith, consisting of 1½ acre of land, having frontages to the Fulham Palace-road, and also to Church-lane. There are nine houses on the estate producing rentals of 28*l.* per annum. In the particulars it was urged that the estate, from its commanding position, near to the Hammersmith Station, is capable of being advantageously developed for building. It was sold for 4,400*l.* Messrs. Baker also submitted for sale the freehold building estate known as Hanwell Park, close to the Hanwell Station of the Great Western Railway Company. The property, which contains 107 acres, together with a mansion and out-buildings, was submitted in lots, the auctioneer observing that the estate offered, to land companies and others, a favourable opportunity for the development of a building scheme. Brick-earth, gravel, and sand of good quality existed in large quantities on the estate. Several of the lots were sold, containing altogether nearly 60 acres, the proceeds of the day's sale being 26,500*l.* Messrs. W. & E. Houghton also sold the East Lodge Estate at Wanstead, containing a little more than 4 acres, for 4,900*l.*, and, also, between three and four acres of land at Walthamstow for 3,600*l.* Messrs. Thurgood & Martin submitted for sale a freehold building estate at Wimbledon, a short distance from the Wimbledon Station, and also from another station about to be constructed. The estate, which contains nearly 13 acres, was sold for 7,250*l.*

Patricroft.—The Local Government Board have recently approved of plans of new separate cell vagrant wards to be erected at the Workhouse, Patricroft, for the Barton-upon-Irwell Board of Guardians, at an estimated cost of 1,000*l.* The plans were prepared by Mr. John Price, Assoc.-M. Inst. C.E., engineer and surveyor to the Barton Sanitary Authority.

New Bank Buildings at Balham.—With reference to our notice of these buildings in the *Builder* of the 17th inst. (p. 718), it should have been stated that the whole of the Bath stone was supplied from the Westwood quarries of Messrs. Randell, Saunders, & Co., Limited.

The Future of the Grand National Opera House Site.

After remaining for some six or seven years in its unfinished condition, during which period it has from time to time been rumoured that the building was about to be completed,—at one time the report being that it was to be finished for its original purpose, whilst at another time the rumour was that it was to be converted into an hotel,—the fate of the unfortunate Grand National Opera House building on the Thames Embankment is at length settled. The materials of the unfinished structure are now announced to be sold by auction, in order to clear the site for the erection of buildings of a different class, which will shortly be commenced by a company of capitalists who have purchased the site with the half-finished Opera House as it now stands, together with a number of adjoining houses in Cannon-row, and three shops in Parliament-street, opposite the new Government Offices. The sale of the materials will occupy several days next month, Messrs. Fuller, Horsey, & Co. being the auctioneers. It will be remembered that Mr. Webster was the contractor for the building, and it is well understood that the cost of the structure, up to the time when the works were brought to a stand, was little short of 50,000*l.*, the excavations and foundation walls alone, before the superstructure was proceeded with, having involved an outlay of more than 15,000*l.* When the works at the building were suspended, an enormous amount of iron work had been got in, and the level of the grand tier had been reached; and although the elevation had been carried to a considerable height above the road level of the Embankment, the building as it appears from that thoroughfare does not represent its present attitude internally, as both the auditorium and stage portions extend very much below the main line of street.

The catalogue, containing a list of the materials to be sold, states that they consist, amongst other articles, of 5,000,000 bricks; 400 iron riveted girders and joists; 100 cast-iron columns and stanchions; 20,000 ft. run of flooring joists; six tons of ornamental cast-iron rail fencing and gates; 100 loads of timber; and 1,400 scaffold boards and poles, in addition to the valuable Portland stone work with which the Embankment facade and the two side frontages are faced. We understand that the new buildings which are intended to be erected on the site as soon as cleared will consist chiefly of residential chambers and offices, having frontages and approaches both on the Embankment and in Parliament-street.

Land in New South Wales.—The amount of land in occupation in New South Wales on 31st of March, 1883, was 30,714,349 acres, as compared with 10,619,532 in 1874, while the number of occupiers was 39,760, as compared with 32,258. The quantity of land sold during the year 1882 by the Government of New South Wales, otherwise than conditionally, amounted to 1,029,998 acres, or 300,000 less than in the previous year; while the number of acres sold conditionally during the same period was 2,392,219 acres, or 63,000 more than in the previous year, or 1,000,000 more than in 1873. With regard to the lands leased for pastoral purposes, the preference seems to have been decidedly in favour of annual rather than longer leases; for whereas the number of the latter in the ten years had only risen from 4,070 to 4,337, the number of annual leases had increased from 14,260 to 20,663; and while the area included under the latter had actually decreased from 233,178 square miles to 199,743, the area under the annual leases had risen from 14,643 to 28,008 square miles.

Exhibition of Works in Wood.—The collection of examples of carpentry and joinery which has been formed at Carpenters' Hall, in London-wall, and which has been more than once brought under the notice of our readers in the course of its formation, will be open to the public on Monday next. It will be found that a very considerable number of models, specimens, and drawings have been got together in the large hall of the Company, where they are extremely well shown. The competition for prizes has been keener in some departments than in others, the highest level attained being by the carvers in wood. We shall give full details of the exhibition next week.

Mayfield.—Large additions and restorations are about to be made to the Old Palace at Mayfield, Sussex. They will be carried out from the designs of Messrs. Pugin & Pugin, of Westminster.

Working-Class Progress in New South Wales.—According to the Statistical Register of New South Wales, the wages of the labouring classes in that colony appear to have been steadily maintained during the last ten years, with a tendency to rise in the case of farm labourers, persons engaged in agriculture, and domestic servants. At the same time there has been a marked decrease in the cost of clothing, which is, however, counterbalanced to some extent by the increased cost of many kinds of provisions, which will become cheaper as railway communication with the agricultural districts becomes increased. The percentage of the wage-earning class owning land or house property is stated to be larger in New South Wales than in any country in the world, with the exception of portions of the United States.

The Association of Public Sanitary Inspectors.—This new but flourishing and useful society, of whose proceedings our columns have on several occasions contained particulars, will hold its first annual dinner on June 7th at the Holborn Restaurant, when the President, Mr. Edwin Chadwick, C.B., hopes to be able to take the chair.

TENDERS.

For new roads and drains on the Eversfield Estate, St. Leonard's-on-Sea. Messrs. Fowler & Hill, architects:—
A. Oliver, Beckley..... £1,000 0 0
P. Jenkins, St. Leonard's..... 720 0 0
J. Oliver, Houghton..... 625 0 0

For building Mission-hall on the Noel Park Estate, Hornsey. Mr. Rowland Plumb, architect:—
Deering & Son..... £2,247 0 0
Mills..... 2,250 0 0
Goodman..... 1,989 0 0
Holloway..... 1,985 0 0

For the erection of New Mission-hall in rear of Sailors' Rest, Commercial-road, Landport, Portsmouth. Messrs. Davis & Emanuel, architect. Quantities supplied by Mr. H. P. Foster:—
W. Ward..... £1,479 0 0
C. C. Cooper..... 1,470 0 0
H. & W. Evans..... 1,420 0 0
T. H. Roberts..... 1,376 0 0
W. R. & C. Light..... 1,349 0 0
G. Burbridge, (accepted)..... 1,283 0 0

For erecting eight houses at Brixham, Devon, for Mr. Feakins. Mr. G. Soudon Bridgman, architect, Torquay:—
Blatchford & Lee..... £2,004 7 7
Wills & Tilley..... 1,760 0 0
Bundell..... 1,720 0 0
Couch & Patient..... 1,698 0 0
Hazlewood Bros., Brixham..... 1,680 0 0
* Accepted.

For three cottages, Kingwear, Dartmouth, Devon, for Mrs. Bame. Mr. G. Soudon Bridgman, architect:—
Short Bros..... £597 0 0
Bundell..... 557 0 0
Winsor..... 524 0 0
Pack..... 498 0 0
Foaden..... 498 0 0
Goy..... 490 0 0
Wills & Tilley, Brixham (accepted)..... 493 0 0

Accepted for schoolmaster's residence, Chudleigh, Devon, for Mr. W. Rouse. Mr. G. Soudon Bridgman, architect:—
Rattich, Chudleigh..... £297 10 0

Accepted for various works for the Right Honourable Lord Clifford, Upbrook Park, near Chudleigh, Devon. Mr. George Soudon Bridgman, architect:—

Hayes Farm House...... £2405 0 0
Yeoman, Kingsteignton..... £245 0 0
Upcott Villa Cottage Skids...... £120 0 0
Ball & Shapley, Chudleigh..... £120 0 0
Waddon Villa Cottage...... £186 0 0
Ball & Shapley, Chudleigh..... £186 0 0
Waddon Grange...... 76 9 0
Widdicombe & Babbage, Chudleigh..... 76 9 0

For conservatory and repairs to a house, Elmfield-road, Bromley. Mr. St. Pierre Harris, architect:—
Crossley..... £142 0 0
Taylor & Son..... 139 0 0

For additions and alterations to Wellbrook Cottage, Farnborough, Kent. Mr. St. Pierre Harris, architect:—
Taylor & Son (accepted)..... £214 0 0
[No competition.]

For painting and repairs to houses at Orpington, Kent. Mr. St. Pierre Harris, architect:—
Taylor..... £202 0 0
Hart Bros..... 173 0 0
Smallwood..... 159 0 0
W. & F. Croaker (accepted)..... 117 0 0

Accepted for erection of premises for Mr. C. Bond, Blackheath:—
D. & R. Kennard..... £1,035 0 0
[No competition.]

Accepted for erection of workmen's cottages, stabling, &c. for Mr. W. Brown, Hurst Ash, Lee:—
D. & R. Kennard..... £210 0 0
[No competition.]

For additional buildings and alterations to the Clifton Congregational Church, Asylum-road, Peckham, S.E. Quantities supplied. Mr. J. Walls Chapman, architect:—
T. & F. Drake..... £3,354 0 0
Goad..... 3,349 0 0
Simmonds..... 3,337 0 0
Dove Bros..... 3,228 0 0
Staines & Son..... 3,148 0 0
Canning & Mullins..... 3,120 0 0
Collis & Son..... 3,070 0 0
Woodward..... 2,930 0 0
Tarrant & Son..... 2,919 0 0
S. J. Jerrard..... 2,889 0 0
Martin, Wells, & Co..... 2,850 0 0
Pack Bros..... 2,650 0 0

For alterations and additions to the Congregational Church School at Blackheath, S.E. Quantities supplied. Messrs. T. L. Banks & Townsend, architects:—
Staines & Son..... £3,221 0 0
D. & R. Kennard..... 3,221 0 0
D. & R. Kennard..... 3,212 0 0
Hosking..... 3,187 0 0
Tongue..... 3,187 0 0
Rider & Son..... 2,909 0 0
Jerrard, J..... 2,879 0 0
Outhwaite & Son..... 2,821 0 0

For the erection of new premises, Nos. 211 and 212, Tottenham Court-road, for Messrs. Hewetson & Milner. Messrs. Battersby & Huxley, architects:—
J. & C. Boyer..... £3,335 0 0
H. Manley..... 3,269 0 0
Higgs & Hill..... 3,227 0 0
J. W. Dixon..... 3,183 0 0
Holliday & Greenwood..... 3,077 0 0
Pattison & Potheringham..... 2,983 0 0
B. E. Nightingale, (accepted)..... 2,769 0 0
* Accepted.

For the erection of Studio, No. 54, Park-road, Havestock-hill, N.W. for Mr. H. Tuck. Messrs. Battersby & Huxley, architects:—
G. Eddy, Fleet-road (accepted)..... £243 0 0

Accepted for villa residence and stable buildings at Abergevenny, Monmouthshire, for Dr. Norris F. Davey. Mr. E. A. Johnson, architect, Abergevenny. Quantities by architect:—
T. Foster, Abergevenny..... £2,118 0 0

For the erection of a cottage villa, North-street, Abergevenny, for Mr. Thomas Protheroe. Mr. E. A. Johnson, architect. Quantities by architect:—
Edwin Sheen, Abergevenny (accepted) £297 0 0
Thomas Foster..... 310 0 0
Ellis Stephens..... 330 0 0

Accepted for the construction of boundary walls, foot-paths, &c., at Bailey Park, Abergevenny. Mr. E. A. Johnson, architect:—
J. G. Thomas, Abergevenny..... £780 0 0

For Entrance-gate and Railing, Hampton & Bromley, Abergevenny..... £243 0 0

For two, Side-fence Railing and Stabling Enclosures, G. Davis, Abergevenny..... £239 0 0

For additional Southlands, at Blackgang, near Ventnor, for the Isle of Wight Sanatorium, Limited. Contract supplied. Mr. J. M. Joun G. Livesay, architect. Quantities:—
A. Colenutt, Niton..... £1,669 7 0
Edwin Hayles, Niton..... 1,638 10 0
Ingram & Son, Ventnor..... 1,550 0 0
H. Balfour, London..... 1,453 0 0
Jolliffe & Sons, Ventnor..... 1,393 0 0
Slisbury & Kingwell, Ventnor*..... 1,246 0 0
* Accepted.

For additions to 40, Junction-road, Holloway, for Mr. G. H. Parkins. Mr. Banister-Fletcher, architect:—
Ward & Lamb (accepted)..... £270 0 0
[No competition.]

For alterations to the Horns public-house, Hackney-road. Messrs. Bird & Walters, architects:—
Birch & Co. Fotheringham..... £943 0 0
Patman & Fotheringham..... 881 0 0
Williams & Co..... 856 0 0
W. Shurmer..... 837 0 0
R. Marr..... 830 0 0
Jackson & Todd..... 759 0 0

For the enlargement of schools, Old Ford-road, Bow, for the School Board for London. Mr. E. R. Robson, architect:—
F. & F. J. Wood..... £8,076 0 0
G. S. Pritchard..... 8,707 0 0
W. Goodman..... 8,699 0 0
W. Shurmer..... 8,699 0 0
W. Bangs & Co..... 8,642 0 0
Steel Bros..... 8,624 0 0
Perry & Co..... 8,354 0 0
C. Wall..... 8,249 0 0
Atherton & Latta..... 8,238 0 0
J. R. Hunt..... 8,224 0 0
S. J. Jerrard..... 8,089 0 0
Wall Bros..... 8,076 0 0
Stimpson & Co..... 7,770 0 0

For the erection of Schools at Daubney-road, Clayton, for the School Board for London. Mr. E. R. Robson, architect:—
F. & F. J. Wood..... £19,546 0 0
W. Goodman..... 18,477 0 0
Jackson & Todd..... 18,244 0 0
C. Wall..... 18,184 0 0
H. Hart..... 18,149 0 0
W. Bangs & Co..... 18,082 0 0
G. S. Pritchard..... 17,995 0 0
Perry & Co..... 17,980 0 0
T. Boyce..... 17,950 0 0
C. Cox..... 17,898 0 0
W. Shurmer..... 17,892 0 0
Wall Bros..... 17,759 0 0
J. R. Hunt..... 17,714 0 0
S. J. Jerrard..... 17,139 0 0
Stimpson & Co..... 17,055 0 0

For the erection of St. James's Church and Presbytery, Botic, Messrs. M. E. Hadfield & Son, Corn Exchange-chambers, Sheffield, architect. Quantities by Mr. D. J. Brown:—

	Nave Aisle, Chapel, and Chancel.	West End and Tower.	Upper Part of Tower and Spire.	Presbytery.
Fogarty.....	13,128 17 3	5,058	3,045	2,889
Thornton & Son.....	12,350 0 0	5,100	2,700	3,015
Ray.....	12,270 0 0	4,874	3,060	2,878
Mulholland & Son.....	11,400 0 0	4,553	3,275	2,907
Leslie & Sons.....	11,311 0 0	4,925	3,015	2,836
Webster.....	11,200 0 0	4,680	3,047	2,768
Gabbott.....	11,189 0 0	4,501	2,699	2,599
Woods & Son.....	10,500 0 0	4,250	2,223	2,700

* Accepted.

For the erection of Clifton-street Board School, for the Swindon School Board. Mr. W. H. Read, architect, Corn Exchange, Swindon:—
J. W. Snel, Maidenhead..... £5,513 15 4
H. J. Rosier, Bristol..... 5,349 0 0
W. J. & C. S. Young, Salisbury..... 5,100 0 0
A. King, Gloucester..... 5,088 0 0
H. Welch, Hereford..... 4,950 0 0
W. Gibson, Exeter..... 4,881 0 0
Howell & Sons, Bristol..... 4,890 0 0
J. Williams, Swindon..... 4,750 0 0
Stephens & Bastow, Bristol..... 4,750 0 0
W. Jones, Gloucester..... 4,750 0 0
C. Phillips, Swindon..... 4,749 0 0
T. H. Kingerlee, Oxford..... 4,568 0 0
G. Wiltshire, Swindon..... 4,554 0 0
A. J. Bevan, Bristol..... 4,550 0 0
T. Barrett, Swindon (accepted)..... 4,500 0 0
W. Cowley, Cheltenham..... 3,169 15 0

For alterations, &c., to premises known as Rutland House, Cambridge-road, Hastings. Mr. A. W. Cross, architect, Hastings:—
Vigor..... £256 0 0
Avis..... 490 0 0
Rodd..... 465 19 0
Vidler..... 443 0 0

For the erection of a lamp factory, No. 1, Cross-street, Great Sutton-street, Clerkenwell, E.C., for Mr. J. E. Drummond & Mr. Thomas Durrant, architect, 44, Upper Baker-street, N.W.:—
Clarke Bros..... £2,280 0 0
H. Howard..... 2,268 0 0
J. Edgar..... 2,239 0 0
W. H. Butcher..... 1,993 0 0
C. Scheider..... 2,036 0 0
Kirk & Randall..... 2,000 0 0
W. Brass..... 1,993 0 0
Collis & Son..... 1,987 0 0
H. & E. Lee..... 1,872 0 0
Mattock Bros..... 1,777 0 0
A. G. Bolding (accepted)..... 1,687 0 0

Accepted for Wesleyan Schools, Bamber Bridge, near Preston. Mr. D. Grant, architect:—
Thomas Croft (Brickwork).
J. Williamson & Sons (Stone-work).
George Hill (Woodwork).
J. Swarbrick (Plastering).
R. Crossdale (Plumbing, Painting, &c.).
Messrs. Metcalf & Dilworth (Heating).
Total amount of accepted Tenders..... £1,78 0 0

Accepted for New Wesleyan Chapel and Schools at Freckleton, near Kirkham. Mr. D. Grant, architect, Preston:—
Thomas Singleton (Brickwork).
M. Gardner (Stone-work).
J. Gardner (Woodwork).
R. Crossdale (Plumbing, Painting, &c.).
J. Highy (Plastering).
J. R. Bradshaw (Slatting).
Metcalf & Dilworth (Heating).
Total amount of accepted Tenders..... £1,286 0 0

For building 36 cottages on the Westbury Park Estate, Barking, for Mr. Henry Copland. Mr. C. J. Dawson, architect, Barking:—
Mansfield, Stratford..... £4,248 0 0
Argent, Barking (accepted)..... 4,284 0 0

For building pair of semi-detached cottages at Barking, Essex, for Mr. Jarvis. Mr. C. J. Dawson, architect:—
Drake, Barking..... £150 0 0
Pegmore, Barking..... 325 0 0
Gooder, Barking..... 475 0 0

For sundry alterations and cleansing and painting work to the Workhouse at Romford, Essex, for the Guardians of the Romford Union. Mr. C. J. Dawson, architect:—
Barnes, Ilford..... £285 5 0
Drake, Barking (accepted)..... 280 0 0
Wood, Chelmsford (accepted)..... 249 0 0

For the erection of ambulance station adjoining the Eastern Hospitals, Homerton, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harcourt, architects, 16, Leadenhall-street. Quantities supplied:—
T. Boyce..... £11,119 0 0
B. E. Nightingale..... 10,927 0 0
Mages & Co..... 10,725 0 0
Wall Bros..... 10,713 0 0
Stephens & Bastow..... 10,469 0 0
W. Shurmer..... 10,440 0 0
J. Holland..... 10,335 0 0
Howell & Son..... 10,300 0 0
J. Garrud..... 10,191 0 0
S. Chasen..... 10,30 0 0
H. & A. Brown..... 9,378 0 0
W. S. Jocelyn, * 123, Borough..... 5,138 0 0
* Accepted.

For building Mission hall and boundary-wall in Latimer road, Notting hill, for the Committee of the London City Mission. Mr. J. Christian Hukins, architect:—
Higgin & Brown (accepted) £1,061 0 0

For Kenilworth Water Works (Contract No. 2) for the manufacture and erection in Kenilworth of two 12-H.P. Gas Engines and two sets of three-throw pumps. Mr. E. Pritchard, M.I.C.E., engineer, London and Birmingham:—

	"Otto."	"Clerk."
H. Young & Co., Pimlico	£3,510	£3,510
J. Hutton, Coventry	1,606	1,606
Franchini Bros., Manchester	1,500	1,500
Crosley Bros., Manchester	1,499	—
Glenfield Co., Kilmarock	1,418	1,355
Piercy & Co., Birmingham	1,360	1,300
W. Glover & Sons, Warwick	1,161	1,161

* Accepted.
For Kenilworth Water Works (Contract No. 3), pumping station, pipe-laying, and water-tower. Mr. E. J. Purnell, Coventry:—

C. Haywood, jun., Coventry	£4,700 0 0
S. Turner, Wolverhampton	4,606 8 7
Currell & Lewis, Birmingham	4,147 0 0
Evans Bros., Wolverhampton	4,062 0 0
G. F. Smith, Leamington	3,986 0 0
J. Fell, Leamington	3,850 0 0
Stinson & Kellett, Leicester	3,678 18 0
Holme & King, Kenilworth	3,643 0 0
H. Hill & Sons, Birmingham	3,420 0 0
J. Biggs, Handsworth	3,409 0 0
J. Dickson, St. Albans	3,393 0 0
G. Law, Kidderminster	3,337 0 0
E. Smith & Son, Kenilworth	3,378 0 0
C. J. Corrie, Lichfield	3,321 0 0

* Accepted.
For re-building Nos. 10, 11, and 12, Regent-street, Swindon, for Mr. L. L. Morse. Mr. W. H. Head, architect, Swindon:—

H. Rossett, Bristol	£2,935 0 0
Howell & Sons, Bristol	2,740 0 0
C. Phillips, Swindon	2,743 0 0
T. Barrett, Swindon	2,656 4 7
G. Wiltshire, Swindon (accepted)	2,664 12 0

For additions to the Station in Commercial-road, E., for the London Salvage Corps. Mr. Wimbles, architect:—

Hall, Beddall, & Co.	£3,990 0 0
Lawrence & Sons	3,764 0 0
J. & J. Greenwood	3,763 0 0
Grover	3,763 0 0
Ashby & Homer	3,725 0 0
Mortimer	3,693 0 0

For making-up Ferme Park-road North (part of), and Ferme Park-road South, for the Hoxsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor:—

	North.	South.	Total.
Cooke & Co., Battersea	£268	£1,439	£2,225
Wilkinson Bros., Finsbury-park	520	992	1,513
McKenzie & Co., City	438	926	1,412
James Pizze, Hoxsey	449	942	1,391
Alfred Walker, Holloway	391	733	1,144
E. & W. Iles, Wimbledon	385	730	1,145
F. A. Jackson & Sons, Finsbury-park	408	718	1,124
T. G. Dunmore, Crouch End (accepted)	364	635	1,020

For the erection of eight houses on the Spring Grove Estate, Peckham Rye. Mr. G. S. Harrison, architect. Quantities by the architect:—

Hedley	£4,200 0 0
A. White & Co.	3,719 0 0
Turner	3,700 0 0
Eldridge	3,353 0 0
Lordan	3,100 0 0
Best	3,050 0 0
Crocker	3,040 0 0
Priestley	3,000 0 0
D. D. & A. Brown	2,990 0 0
Parker	2,800 0 0
Aldridge & Genvey	2,772 12 0

For St. Gabriel's Mission Church, Walthamstow. Mr. J. T. Bresey, architect:—

A. Reed, Stratford	£2,563 0 0
T. Rider & Son, Southwark	2,401 0 0
J. Eggle, Buckhurst-hill	2,383 0 0
J. Morter, Stratford	2,370 0 0
W. Bangs & Co., Bow-road	2,286 0 0
Harris & Wardrop, Linehouse	2,269 0 0
J. A. Reed, Walthamstow	2,261 0 0
W. Larter & Sons, London	2,242 0 0
W. Shummur, Lower Clapton	2,232 0 0
S. J. Scott, Walthamstow	2,103 0 0

For making and draining with sewer and surface water drains, Odessa-road, Cann Hall Estate, Stratford, E., for the Imperial Property Investment Company, Limited. Mr. G. H. L. Stephenson, surveyor, 57, Moorgate-street, E.C.:—

McKenzie & Co.	£1,090 0 0
Dunmore	1,069 0 0
Walker	1,034 4 0
Pizze	954 0 0
Bell	888 0 0
Wilson (accepted)	817 0 0

Laundry, Twickenham.—A list of Tenders for this work has reached us, but, as it is not authenticated by the sender favouring us with his name and address, we cannot publish it. When will correspondents learn that all communications must be accompanied by the name and address of the sender, not necessarily for publication, but as some earnest of good faith?

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H. R. (Franklin on Water)—J. B. A. J. B. H. T. M. R.—J. B. C. cannot publish unless amount of tender is given.—R. I. (Lancashire)—W. & Co. (last week)—C. Bros.—S. C. J. T. M.

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We are compelled to decline pointing out books and giving addresses.

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Letters or communications beyond mere news items which have been duplicated for other journals, are NOT DESIRED.

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INTERNATIONAL HEALTH EXHIBITION

Supplements to The Builder.

No. 2. MAY 24, 1884.

THE WORKSHOP, OR RELATION OF INDUSTRIAL CONDITIONS AND PROCESSES TO HEALTH.

The exhibits relating to "The Workshop," or Group 5, will for the most part be found in the East Central Gallery A. Though the group includes a somewhat wide range of objects, extending from Classes XLI. to XLVI., as catalogued, on examination the exhibits are far from being fully representative, looked upon as regards each class in itself. The objects, however, as a whole, or as far as they illustrate the workshop in sundry of its sanitary bearings, in regard to the health and safety of the workmen, are very important, and must command attention on the part of all intelligent observers, professional and general. We have to find some fault with the classification, as the exhibits do not follow in sectional sequence, and the objects in some classes might well be included in others,—they are so few and in reality form portions of exhibits that ought not to be classed separately, unless they were multitudinous, which is not the case in the present workshop group. Before proceeding to describe a number of the representative exhibits, it may not be amiss to mention that not one exhibitor's stand in the Group had an attendant present to answer a query. This did not matter so much to the practical examiner, but it is otherwise with the ordinary visitor, or would-be purchaser, who desires some information, or a printed notice or brief description of the objects on view. But even these printed explanations were very few and far between, and their absence must tend to the loss of the exhibitors. Reversing to a great extent the order of the classification, we commence at XLV., where we were led to expect objects in relation to sanitary construction and inspection of workshops, factories, and mines. Models of workshops and factory constructions we observed most, though we found new inventions, improvements, and fittings for ameliorating the conditions of the life of the workers, as also means for economising human labour in a number of industrial operations.

Messrs. Primrose & Co., of Sheffield (Stand 1,832), present very good samples of what they term their patent "eclipse" glazing, illustrating a fairly efficient system of open work for ventilation, and closed glazing for the exclusion of air. The workmanship is good, and the system admits of application to schools, mills, and other buildings, as well as workshops.

The Rettie Patent Seat Company, Limited (Stand 1,834), of Cannon-street, supply an urgent want, and it is done with compactness, economy of space, and also with efficiency. These seats are well fitted for affixing behind counters for shop-assistants, while there are other forms of seat equally well suited for office stools in banks, counting-houses, hotels, schools, and even in shops. The seats are so constructed that they pivot back into an upright position out of the way when not required, thus in no instance causing an obstruction or blocking of the passages should they be affixed near one.

Mr. Charles Hare, of Norwich (Stand 1,836), presents a very serviceable and improved appliance for working shoemakers, comprising a last on a stand, which will allow the boot or shoe to be held in any desired position. This and some other appliances of a similar kind to be presently noticed obviate the old immemorial sitting position of the workmen in the boot and shoe trades. The operatives of the old school will not take to these appliances designed for their health, but will persist in working on their low seats, bent over their work with the hard last or boot in process of development, pressing against their chests, producing weak

lungs and curvature of the spine. The young generation of working shoemakers in machine-shops are, however, at present, and have been for some years, performing their work at their benches in a standing position.

Messrs. J. Sparkes Hall & Son (Stand 1,337), of Regent-street, exhibit an upright shoemaker's bench. A leather-covered pad, somewhat in form like a life-belt, with a central opening, is affixed on the top of a pedestal or hollow stand in front of the shoemaker's bench. A leather strap passes over the last or shoe (as the case may be), lying across the pad, and this strap passes down the central opening, and is tightened by the foot of the workman pressing a treadle in connexion with the hollow pedestal. The method is very simple and effective, and the workman at his pleasure can tighten or relax the grip of the strap on the last or boot, and turn the latter round in an instant to suit the progress of his operation.

Mr. Edward B. Fitton, her Majesty's Inspector of Factories, Malvern (Stand 1,343), displays some plainly-made, but withal serviceable, movable seats for shops and workrooms. They are somewhat small in size and oval in shape. They can be adjusted in any position, to corner space, angle, or leg of bench. They form, in fact, a revolving bracket with pivot working in screwed-on socket when adjusted.

Class XLIV. was intended to afford illustrations of diseases and deformities caused by unhealthy trades and professions, and also to show methods for combating these diseases, along with preservative measures. This class, as it now appears, is scarcely representative at all. The announced models of Dr. Steele, of Guy's Hospital, are not on view. These clever wax models were to be illustrative of skin diseases brought on by unhealthy occupations, such as the effect of glanders on the arm of a groom; hands showing the results caused by working with oxalic acid and arsenical preparations, or with pigments used in dyeing; injuries caused by scot, sweeps' cancer; and the effects of other diseases common to various workmen. If these were well-executed models they would certainly be an acquisition to this class of the workshop group. It is stated, however, in a rather covert way, as we learned on inquiry, that the wax models were likely to prove objectionable to some of the visitors.*

Before dealing with Class XLIII. we may observe here that the effects of arts, trades, and professions in regard to health and longevity have been treated, to some extent, long years since; and this journal has on sundry occasions treated the matter in respect to the building and some other trades. Fifty years ago there were nearly two hundred employments which were injurious to the workers. Modern sanitary conditions and regulations have reduced the number of these, but some fresh ones have appeared in the meantime in connexion with noxious trades and methods of manufacture. In regard to workmen alone there are cases where employment or too great exposure in the open air, with insufficient food and clothing, generate certain complaints; secondly, cases of disease where employments are carried on in impure air; thirdly, where employments produce dust, odour, or gaseous exhalations; fourthly, where employments injure or annoy by acting on the skin; fifthly, where employments expose workers to wet and steam; and, sixthly, where workers are exposed to a high temperature or great variations of temperature. We might adduce other causes, but this is sufficient for our

purpose. We had hoped to find illustrations of all of these in the class of objects under notice, but very few indeed are presented, though what are shown are important. Of course the grinders and machine-makers of Sheffield afford the largest standing illustrations of unhealthy and killing trades. In these instances better methods of ventilation in workshops were advocated, and mouth-pieces and guards for the mouths and noses of the workmen suffering from the effects of poisonous dust, breeding skin and lung diseases.

In Class XLIII., embracing objects for personal use,—mouthpieces, spectacles, dresses, hoods, &c., for use in unhealthy trades,—there are a few important exhibits, but much that should be forthcoming is absent. Messrs. Squire & Son, of Oxford-street (Stand 1,329), display a number of mouthpieces or guards for workers engaged in unhealthy or poisonous trades. These guards are adjusted in a similar manner to the respirators worn by those afflicted by lung disease, when it is desired to avoid inspiring damp or moist air, or to soften the effects of cold winds. The material in the present instance is good, and the mouthpieces are not at all unshapely. Bows, or loop strings, of elastic, are fastened on, and, passing behind the ears, hold the mouth or nose piece in its place. Some respirators are partly of cork, woven over, and others are metallic, with an outer covering of thin black stuff, but sufficiently open in its texture to admit of the filtration of air in its passage. Messrs. Squire's articles are both guards and respirators, and we can commend them to the use of operatives requiring them. The *Builder*, a good many years since, took a leading part in the moustache movement, recommending the wearing of the beard and whiskers by stonemasons. A large number of operatives adopted our advice, and were saved from lung and chest complaints, engendered by the constant inhaling of dust in connexion with working various kinds of building stone. The beard on the upper and lower lips, when of sufficient length and closeness, acts as a good natural air filter. From time immemorial lime-burners, or those working in lime-kilns, have carried small wisps of hay in their mouths, or rather clutched between their teeth, when at work. Workers engaged in certain chemical works, where chloride of lime is produced, also use wisps of hay, or other substances, to prevent their inhaling deadly gases, allowed to escape at times in the course of production.

Nearly backing against the previous stand is that of Dr. Roth, who exhibits a large number of well-executed models, as well as numerous diagrams illustrating injurious and healthy positions, for the instruction of teachers in physical education. These are partly models in illustration of gymnastics in its bearings on health. Some of the models are made to display the effects of wrongly-made and adjusted clothing. For want of being afforded sufficient space a large number of models intended for Dr. Roth's stand are absent, but those which are on view are very suggestive and instructive. Though the exhibits of this stand, according to the catalogue, are classed in Group 4 ("The School") a number of them belong to the workshop in conjunction with the school, such as hygienic chairs, desks, and benches. We thought, however, it would not be amiss to mention these kindred exhibits incidentally.

Messrs. Joseph Davis & Co., Fitzroy Works, Kennington Park-road (Stand 1,328), do not display their objects as a whole as announced in the catalogue, except in regard to lenses to suit the sight of various classes of workmen, including stonemasons. We failed during our visit to notice on this stand the specified "gauze wire eye-guards (magnetised) for the protection of needle-grinders, and various other

* Those who know the (in one sense) splendid collection of wax models of skin disease presented by Sir Erasmus Wilson to the College of Surgeons, will quite understand the objection to an exhibit of this kind in a public place open to all comers.

eye-guards for the use of workmen." They may, however, have been covered up somewhere in paper, for this glass case and a large number of others have to speak for themselves as far as their contents are concerned.

Mr. Thomas H. Harrison, Hatton-garden (Stand 1,327), presents a selection of improved eye-protectors, reading-shades, and some kindred objects. The reading and sun shades are somewhat novel in form, but are well made and finished. Without saying too much in their favour, we fully believe that in many instances they will be found to be very serviceable. The material is a vulcanite, and the shades are of various colours. The finish of a number of these eye-protectors, in appearance at least, is superior to similar objects previously made from more costly materials. They are certainly calculated to ease the eyes, which often painfully suffer under a glaring sun or a flaring and sulphurous gas-light.

Class XLII. comprises objects cognate to the previously-mentioned class, viz., apparatus and fittings for preventing or minimising the danger to health or life from the carrying on of certain trades. It is also intended to show a number of guards, screens, fans, air-jets, solutions, washes, &c. The original intention, however, has only been partially realised, for the objects on view are only to a small extent representative. Mr. William Clark, engineer (Stand 1,321), of Plumstead, and also of the Royal Arsenal, Woolwich, exhibits a well-made model of apparatus for drawing dust and foul air from grinding-machines. It is stated the apparatus will do this to any extent or distance, and will do it by forcing the air and dust through a series of fine sprays of water to purify the atmosphere. We would like to see the large apparatus in action before giving a decided opinion upon it. The model, though ingenious and seemingly well calculated to effect the objects in view, is not sufficient in itself to satisfy us. We may only say in regard to its construction, that there are a number of longitudinal pipes arranged parallel to each other, with a number of openings to each length of pipe. The motive-power being applied, the suction or extraction commences, and the foul air in escaping through the exhaust shaft is subject to sprays of falling water, and hence there is a purification.

Mr. E. V. Gardner, Pall-mall East (Stand 1,321), exhibits his patent electric process of making white-lead. This process is too long to detail, but suffice it to say that by this method the use of female labour in the making of white-lead has been rendered unnecessary. Manual labour, as in other processes, is to a great extent altogether replaced in this. An amorphous white-lead is produced in a couple of weeks. It is important to the workers that in this system wet grinding, washing, drying, and storing are dispensed with, as well as nearly all handling of the material. The opinion of Mr. Redgrave, O.B., Her Majesty's Chief Inspector of Factories, shows that Professor Gardner's process is nearly free from all the objections on the score of the exposure of persons employed in the manufacture. In passing, we may observe that house-painters have been long known to be subject to a disease known as "painter's colic," produced by the handling of white-lead and paints of which it forms the basis. Cleanliness, however, and a daily or constant washing of the hands and cleansing of the nails, with occasional baths, will prevent painters from contracting so serious a disease. Indeed, all building and other workmen engaged in dusty trades should regularly wash themselves over in the evening after their work for the day is done. Mere hand and face rubbing is not enough. There should be a stripping off, and ablution to the wrist.

Mr. Robert Adams, of the Borough, S.E. (Stand 1,320), displays his well-known and efficient appliances in connexion with the opening and closing of sashes and ventilators, and his other apparatus for minimising or preventing accidents in relation to the same in workshops and other buildings. We have already spoken favourably of these very sensible appliances, as shown at former exhibitions.

Mr. James B. Lakeman (Inspector of Factories) & Son (Stand 1,316), exhibits a model of a circular saw-bench, with saw-guard for the prevention of accidents. The device is certainly novel and ingenious, and we have little doubt will, on a large scale, prove satisfactory. By a bracketed arrangement the guard is sus-

pended over the saw, at a suitable distance to allow for the free conveyance of the timber. The guard is, of course, of segmental form, deviating at either end for a short length into a straight line. The straight end of the guard near the operator is hinged, forming a flap that can be raised at pleasure for certain incidental adjustments when required.

On an end stand abutting on the one last named is shown another useful saw-guard, calculated, like the former, to prevent accidents or injury to the workmen employed in the conversion of timber. A large number of accidents, to the loss of fingers, hands, and even arms, have resulted from the use of unfenced wood-working and other machinery. This second model of saw and saw-guard is known as R. W. Taylor's "Patent Automatic Safety Shield." From a careful examination we can say that within certain limits the automatic shield is safe and efficient. The shield makes the circuit of the saw on that portion of it above the table. It is so adjusted that as the piece of timber to be cut approaches the saw, it causes the shield to rise and rest on the wood, assuring safety to the operator without perceptibly increasing his labour in moving the wood. As soon as the timber has passed from the saw, the shield reverts to its original position, entirely covering the circuit of the saw, until raised by the next piece of wood under operation.

On a portion of the same end Stand, Mr. E. B. Marten, engineer, Midland Steam Boiler Inspection and Assurance Company, Stourbridge, exhibits a number of models in cardboard, and also photographs of exploded boilers. The models very fairly illustrate the ruin and *débris* caused by the explosions, showing pieces scattered hither and thither. Some of the models are those of locomotives, and others those of stationary engines. Defects and fractures are shown, and the effects of explosions caused by frozen pipes. The illustrations are instructive to the young workman, and, indeed, to others besides. The models were made by Mr. W. Winslip, Newcastle-on-Tyne.

In connexion with mines there are some inventions and appliances worthy of notice, but we cannot go into long details.

Messrs. John Davis & Son, Newgate-street, E.C. (Stand 1,345), in the class first mentioned in the present notice, exhibit a varied assortment of miners' appliances evidencing excellent manufacture. These include safety-lamps, and anemometers for ascertaining the current of air in sewers, furnaces, &c., as well as in mines and other places. There are also on view colliery electric signals, dynamo-electric exploders for blasting, pit barometers, theodolites, miners' dials, and watchmen's time detectors. Some of these exhibits are improvements on those recently in use in both coal, tin, and other mines in the British Islands.

Messrs. Bickford, Smith, & Co. show a most varied collection of patent safety fuses, patent igniters, and instantaneous fuses for special and general mining uses. The assortment comprises patent tape, gutta-percha, metallic fuses, single, double, and treble, along with fuses for dry and damp soil, subaqueous, submarine, and impermeable fuses. The outside covering or coating is perfectly close and compact in every case, and shows admirable handling and finish. There are also two or three other exhibits of miners' appliances, including safety-lamps, safety-cages, and other articles, but they do not call for extended notice. The Compressed Lime Cartridge Company, Limited, of Queen-street (Stand 1,341), display a number of tools for blasting purposes, with drill pumps and tubes of good quality, besides their line "cartridges," the use of which in mining has been noticed by us on previous occasions. Shortly described, the disruption of the masses of coal is brought about by the expansion of the lime in the "cartridges" when water is admitted to it. Two other exhibitors, Mr. W. Rosewarne, Lelant, Cornwall, and Mr. W. T. White, of Redruth (Stands 1,346 and 1,347), present noticeable exhibits. The former shows a plan or section of a dry or changing house, where miners change their clothes, and the latter another drawing in relation to the same subject.

The literature, statistics, diagrams, &c., in Class XLVI. are absent, save by a reference to the Library, though Mr. Phillip Brannon's illustrations of the "Brannon Method" are announced to be on Stand 1,351. We did not see those drawings showing how workshops and factories are rendered secure from danger of

fire, nor the arrangements for ventilation and sanitary safeguards. Going back to Class XLII. we failed to find the exhibits of Mr. B. H. Thwaite, C.E., of St. Neot's, Hants. These exhibits, with others mentioned (if in the building), are certainly not, as far as we could see, in their allotted places. Thus, in respect to designs and models in the arrangement and construction of workshops, especially those in which dangerous or unwholesome processes are conducted, there is a great want of exhibits of a representative character, though fittings and appliances, apart from the construction of the workshop *per se* as a building, are illustrated to a certain extent, but in a very scattered way. We have now exhausted all the exhibits calling for particular notice in Group 5, and must say, in conclusion, that though many of the exhibits we have noticed have most important bearings on personal health and safety in respect to the future of our workmen, we need still a much better illustration in all its phases of "The Workshop" than is presented in the Health Exhibition.

[There are a number of machines in motion and otherwise, in the Western Gallery, having a bearing on "The Workshop," as well as other groups of exhibits. These may form the subject of a separate notice hereafter, as far as they come within the purview of this journal, or present new features that entitle them to a fair consideration on the part of the building constituency.]

SANITARY FITTINGS.

The exhibits in Class XXIII. comprise water-closets, earth and ash closets, commodes, urinals, with apparatus and material for flushing and disinfecting the same. They are arranged in the East Annex, and are for the most part shown in action. Though as a whole they constitute a very good representative collection of such necessary appliances, we have not been able to discover many novelties. Taking the stands in order, we proceed to notice the chief exhibits, many of which, although mentioned by us on previous occasions, are of such great utility that their merits and advantages cannot be too widely known.

Stand 506 is occupied by Messrs. Bowes Scott & Read, of Westminster, who exhibit various applications of Mr. Rogers Field's patent self-acting syphon flushing tanks and cisterns. One of these tanks is shown in connexion with Bowes Scott & Read's patent enamelled earthenware latrine. The flow of water into the tank can be regulated to a nicety, so that the tank may be filled, discharged, and re-filled at any desired interval of time. These excellent latrines, automatically and thoroughly flushed many times daily, are the very thing for adoption in schools, public institutions, and factories. They are not, unlike even the simplest of water-closets,—liable to get stopped up, under any conceivable treatment, however rough, on the part of the persons using them, and they are immeasurably superior to the old latrines, in which the excretions of a whole school or factory are pent up, and allowed to ferment at the pleasure, may be, of a negligent "care-taker" or labourer,—generally without the least use of disinfectants. These abominations are sometimes so situate in the very midst of large establishments, that even when quiescent the odour from them is nauseating, and this is intensified a thousand-fold when their contents are discharged. That the existence of these filthy receptacles should be tolerated under such circumstances as we have described is evidence either that sanitary legislation is inadequate or that the sanitary inspectors, or the inspectors under the Factories and Workshops Act, are remiss in their duty. We enlarge upon this evil because circumstances have brought it prominently before our notice. Who can say how far the use of such primitive,—nay, barbarous,—receptacles of filth tends to the spread of zymotic diseases amongst factory "hands?" We plead for improvement in this respect in the name of thousands of industrious and intelligent workmen, the preservation of whose health is of the utmost importance, and whose feelings of decency and self-respect must be outraged by being compelled to help in polluting the atmosphere which they and their fellows have to breathe. We are quite willing to believe that employers allow this evil to continue not from want of will to pay the necessary cost of proper sanitary provision, but from want of knowing how to obviate the evil. In

Messrs. Bowes Scott & Read's automatically-flushed latrines, and in those of Messrs. Wilcock & Co., of Burmantofts, Leeds (shown in action at Stand 528), which are equally good, a remedy for this crying evil is provided, and considerate employers of labour have only to see these appliances to adopt them without compulsion in lieu of the foul troughs to which we have alluded. Those employers who are not considerate enough to voluntarily adopt such obvious improvements will, we hope and trust, be compelled to do so with as little delay as possible.

At Stand 507 Messrs. Henry Sharp, Jones, & Co., of the Bourne Valley Works, Poole, exhibit their rock-concrete tubes for large sewers; also sanitary stoneware in the form of traps and other appliances. Field's automatic flush-tank, made of stoneware, is, as we have often pointed out, a very useful thing. By its means small quantities of slops or waste-water are stored up in a reservoir of greater or less capacity, and, instead of being allowed to dribble and trickle through the house drain, are discharged *en masse*, thereby giving the drain a thorough flush as often as the tank fills. The practical value of this arrangement is beyond question.

The Hygienic and Sanitary Engineering Company, of Charing-cross, of which Mr. D. T. Bostel is the managing director, exhibit a section of a dwelling fitted with Bostel's patent "Brighton Excelsior" wash-out closets and other sanitary appliances. Of the closet itself we have before spoken as being effective and cleanly. A night commode and invalid chair, adapted for use in the sick-room, is also shown, together with the Tucker grease-trap,—an American invention the use of which seems likely to be found very convenient,—and Bostel's patent safety ferrule, which is applicable to any kind of bib, ball, or stop-cock. Among other advantages claimed for this contrivance it is urged that if it be fixed to a ball-valve the pressure can be regulated with great exactitude.

At Stand 509 Messrs. A. Emanuel & Sons, of Marylebone-lane, have a good assortment of plumbers' brasswork and some good valve closets, including one with a movable trap, whereby the flange which connects the closet with the trap can be moved round in any direction, so that the closet can be fixed in any position irrespective of the direction of the out-go. Another closet is shown on one of Smeaton's cast-lead "Eclipse" traps for fixing above the floor level. Water-waste preventers, and a door-action urinal in combination with a lavatory, are among the other exhibits made by this firm.

Messrs. Hayward Tyler & Co., of Upper Whitecross-street, are the occupiers of Stand 510, and they exhibit their full-flush valveless closet, fitted in conjunction with Howard's improved syphon flushing cistern. The great merits of this closet are excellence of flush and the absence of any mechanism below the seat, the flushing operation being set in motion by a bell-pull arrangement. Another good closet is the exhibitors' elastic valve closet, with self-trapping overflow. Chandler's patent compound lever ball-valve is rather more expensive than the ordinary ball-valve, but its efficiency appears to be more than proportionate to its increased cost, for it is claimed for it that it will resist a column of water of 1,000 feet pressure, while at the same time admitting of the use of a short ball-lever. Among other useful appliances connected with water supply we notice at this stand Chandler's patent constant hot waste-preventing apparatus for supplying courts or groups of houses which have no independent supply—certainly a far preferable arrangement to the use of cisterns or butts, which are often so neglected that the water, never too free from impurity, is seriously injured and contaminated by storage in them. A good shower-bath valve is also exhibited by this firm.

Messrs. John Warner & Sons, of the Crescent Foundry, Cripplegate, are the tenants of Stand 511, and they have a good display of pumps and water fittings, besides cisterns, baths, lavatories, and water-closets. Among the latter we noticed the "Avalanche" wash-out closet, fixed on one of the "Eclipse" traps above the floor level. A portable bath, mounted on wheels tired with indiarubber, and capable of being quickly and noiselessly conveyed from ward to ward, appears to be admirably adapted for use in hospitals and similar institutions.

The Borough Surveyor of Blackburn (Mr. J. B. McCallum) exhibits, at Stand 512, a new

water-waste preventing flushing cistern which he has just devised, and which appears likely to find favour. The cistern consists of two parts, the outer tank or funnel-head, if we may so say,—the pipe to the closet basin representing the spout of the funnel,—and the inner tank, or cistern proper. There is no ball-valve. The inner tank is so balanced on a pivot that when it is full and ready for discharge it slightly heels over by its own weight and shuts off the supply. The flush is obtained either by a pull-down or seat-action motion, which tips up the inner tank, discharging its contents into the outer tank or funnel-head, whence it finds its way with a rush down the pipe to the closet basin. The working parts of this tank are few and simple, and there are no outlet valves or syphons. This invention will no doubt be looked at with much interest by many visitors to this part of the Exhibition, which, although for obvious reasons not attracting many visitors, is certainly one of the most important sections of the "show," and one which should be visited again and again by householders and property-owners who are endeavouring to acquire a knowledge of the true principles of sanitation and the best modes of applying them.

At the next stand, No. 513, Mr. Thomas Gregory, of Station Works, Clapham Junction, shows the "Shrewsbury Tipper" flushing water-closet, in two forms, one having a hopper-pan, and the other having what is called a "swan-neck" basin,—from the shape of the out-fall trap, it is to be presumed; this basin contains an unusually large area of water (9 in. by 8 in.) for a closet of this class. The chief feature about these closets is the mode adopted for flushing; this is instantaneously effected by a tip-up motion of the flushing tank, very similar, if we remember aright, to that adopted by Mr. McCallum. We saw the "Shrewsbury" closet and flushing tank (which are the inventions of a well-known architect, Mr. William White, F.S.A.) in some previous exhibition, and spoke well of them at the time; but on the occasion of our visit to Mr. Gregory's stand in the Health Exhibition there was no section exhibited showing the precise action of Mr. Whit's tip-up arrangement, which was inaccessible for comparison with Mr. McCallum's tank. However, the "Shrewsbury" closet and tank combined are very effective, special "fans" being adopted for distributing the water with good effect in the basins.

The next stand, No. 514, is occupied by Mr. Anthony Dorrett, of Southsea, with his "Excelsior" silent hydraulic water-closet flushing apparatus, which is set in motion by seat-action from the closet. When the seat is depressed the flushing tank begins to fill, quite noiselessly, it is claimed; and on the seat being released the contents of the tank are discharged into the closet-basin, and the tank remains empty until the next time the closet is used, thereby getting rid of the liability to inconvenience by the action of frost. We described and illustrated this apparatus in the *Builder* a little more than a year ago.

Stand No. 515 is allotted by the catalogue to Mr. John Fairbairn, of Edinburgh, whose intended exhibits are described as syphonic water-closets, urinal, and cistern; but the space was unoccupied as late as Tuesday last.

We propose next week to continue our notice of the most important and interesting exhibits in this section of the Exhibition.

SANITARY HOUSE DECORATION AND ACCESSORIES.

A CERTAIN amount of latitude must be allowed in the admission of various exhibits comprised in Class XXIX., Group 3, as it is very difficult if not impossible to draw a hard-and-fast line to separate those articles which are strictly sanitary and those in which the decorative treatment prevails, as many manufacturers have hit upon such a happy method of giving artistic excellence to their wares that the most strict sanitarian must perforce accept the pleasing with the practical, the result being that we have a high standard maintained in both directions. Further vagueness and indecision in the catalogue, perhaps inseparable from the compilation of such a vast array coming from all quarters at different times, is also apparent here, and we have ceramics, curtains, carpets, and curiosities side by side with paint, paper, and poisons; but confining our attention for the present in this article chiefly to decorative

matters, we start with the East Gallery, where we first notice a small but excellent display (844) by Craven, Dunnill, & Co., who have not only sent some very choice specimens of tiles, but have also arranged them rather happily, so that they are seen to the best advantage. The general design of some of the highly-glazed tile panelling is also effective, the green and brown forming a harmonious contrast, and the surrounding mouldings giving additional richness to an effect which has evidently been well studied, showing how good an arrangement may be produced with comparatively simple materials. The marble mosaics, though few in number, are good, with rather small tesserae, and show that freedom in design to which this material always lends itself, notwithstanding the hardness of line which is frequently noticeable in archaic examples. A vitreous sheath of a very dark tone has also a good effect, and the tiles in relief, both floral and landscape monochromes and usual geometric specimens, are excellent in their way. Messrs. May have a somewhat similar selection, but, we think, are scarcely represented in the way that they might be, their selection not having the strength and warmth of colour of which it is capable. A fine Axminster carpet of quiet tone and design upholds the reputation of Messrs. Yates & Co., 848, and the same may be said of a quiet and good hand-woven Saxony pile carpet, exhibited by the same firm. Messrs. Warner & Hamm, though described in the catalogue in another gallery and class, come next in order with a remarkably handsome selection of brocades, *damasks*, velvets, &c., of all shades and colours, which have the advantage of being well contrasted, and draped in such a way as to bring out their decorative capabilities to the utmost. The Embossed Tapestry Company are quietly and effectively represented by a simple display of their wall-covering, for which they claim indestructibility, and which could be used to some extent where a strong decorative effect is not required. As injury has resulted so frequently from the use of arsenic in obtaining a good green, and even other colours, for wall papers, it is satisfactory to find that its non-employment is fast becoming an assured fact,—at any rate, among the better class of manufacturers,—and this is fully exemplified by Mr. Henry Carr, who not only gives the result, but also the tests, showing the large quantity of poison with which we had to come in contact formerly. The non-arsenical papers range from blues to the brightest greens, and are fairly contrasted side by side. A specimen is also shown of a dark-red paper, eighty years old, designed by Sir Thos. Lawrence as a background for oil-paintings; it is a flock paper of simple design, of small sprigs and flowers; but, however well it may have served its purpose, we lose faith in it when upon examination it is found to yield crystals of arsenic and globules of mercury. The general belief that arsenic was only to be found in green papers is here dispelled, as examples of this agent are shown in sepia, burned sienna, and Payne's grey. Mr. Thomas Hall shows a quiet ordinary form of decoration with Corrovelum wall-covering, which is unaffected by heat or damp, and as such may be as safely used for general purposes of its kind. Some printed cotton velvets and other hangings of an Indian and Persian type, of good pattern, are tastefully displayed by Messrs. Wardle & Co., and are good in their way. One of the few examples of the recent craze for Japanese decorative material has Messrs. Rottman, Siron, & Co., for its exponent, and they have stored clear of the material which was so freely made for the European market, and which flooded us with modern rough-and-ready imitations of the artistic character of the old work which was of such undoubted excellence. The dado is the least satisfactory part, being rather more meretricious, the gold and blue killing each other, but the main wall-surface, of paper made from wood fibre, is very rich and good; the stamped gold panels look remarkably well; a perforated and carved wooden frieze of birds and flowers forms a fitting termination to the wall-surface; a handsome cabinet, with panels filled with carving of birds, fruit, and flowers, is worth notice,—the blossoms, wings, and other features being of ivory and pearl give richness where required; a portion of white and gold panelling, though not following Japanese lines, is none the less satisfactory, and looks clean and cool. Among the accessories is a folding

screen on which the usual dragon in gold lace is worked on silk with the vigour and strength of this favorite representation—the claws being emphasized by the teeth of fish, probably sharks' teeth. Messrs. Scott, Cuthbertson, & Co., have some very effective flock and other papers free from arsenic; a paper printed with a rough effect to imitate tapestry looks well at a small cost. Messrs. Jeffrey & Co., as usual, are well represented, and have by far the best and largest display of papers, and having their space divided into bays they have the advantage of displaying their goods on the return sides, and giving additional force to the contrasts. They also show blocks and rollers used in the process of manufacture, and looking at what appear to be rather rough contrivances, we wonder at the excellence and accuracy of the result, and realise the skill that is expended in producing so simple an affair as a wall-paper as it appears when finished. Messrs. Woollams & Co. are also represented by some good work, which we will notice later on. Messrs. Battam & Heywood, though catalogued in another class, show a section of room with Tynecastle tapestry and washable decoration of a very high class. The subject is a lady's boudoir,—for want of a better name we will say of a Georgian type, and it has evidently been well thought out. It is of a light prevailing colour, with white-panelled dado, with composition flowers, yellow and gold walls, blue and gold frieze. The white chimney-piece and overmantel are elegant and graceful in the extreme. Amber-coloured plush seats at right angles to the hearth complete a very pretty boudoir, which, to our knowledge, has the unqualified approval of several ladies, and the exhibitors may be congratulated on having met their requirements so admirably. The only weak point about it is the ceiling, which is unsuitable and out of scale, but we believe this is only temporary, and can be easily remedied. Some very rich gold-green plush hangings to the doorways form a very happy contrast to the prevailing lightness and add to the general harmony. The Lin-crusta Walton Company are not yet complete, and their treatment with "sad-green" and gold seems hardly as effective as some of their work.

The new "Endolithic Company" have scarcely so strong a representation as they can wish. Their process, which was briefly described recently in the *Builder* (page 600, ante), consists of staining marble permanently to almost any required depth, and with time and further opportunities they may be able to produce more satisfactory work. The basis, of course, is a white or nearly white marble, on which the design is drawn without incision, and the colouring matter when applied sinks to the depth, if necessary, of 1 in., though a sixteenth or an eighth is sufficient for most decorative purposes; the colour, however, is here mostly weak, which, of course, is very unsuitable. The exhibitors have essayed to divide a large slab of marble into three panels, and the cutting in lines are more or less unsteady in effect; the pavement, which is also panelled, is irregular in strength, although one panel, with a dark centre and somewhat archaic border, is more satisfactory; a pink capping to the balustrade, which was intended to have been dark red, gives a weak air to it, which is not helped by a rather pale colour to the green balusters, which by the way are overpainted, and have the effect of porcelain by the glaze upon them. As a matter of fact the company are unprepared at present for exhibition, as the work exhibited at Piccadilly shows that they can do better than this; but that they can ever compete with the beautiful material in its natural form is very doubtful. Messrs. Farmer & Brindley come with some very good specimens of foreign marbles and cognate material, for which their name is famous, ranging from the inexpensive and much-used Pavonazetta to the luxurious *lapis lazuli*; and we here find jade, onyx, porphyry, and Labrador spar, which latter looks so uncomfortably laminated that its bedding of cement seems unable to keep it in its place. A small specimen of "opus Alexandrinum" serves to remind us of a form of decoration of which we ought to use more, and that marble is effective thus as well as by the plain yard super. We are sorry to find our English and Irish marbles totally ignored; this is not as it should be, we have plenty at hand if architects would but call for their use, for which opportunities are frequently occurring, and as frequently neglected. A good display is made by Mr. Joseph Ebner of parquet and mosaic floors,

more particularly the latter, which show some good design and workmanship, although the palm must be given to a vitreous panel representing a musical trophy, well designed and drawn; the cubes are small and cleverly graded in colour, and very satisfactory in general disposition. Whilst upon this subject we may as well mention the vitreous mosaic of Messrs. Belham & Co., who show some good work under the name of Rust's mosaic, used for the floor of the large space occupied by the water companies in their central pavilion. The substratum, being of a porous nature, absorbs the composition to a considerable extent, and thus forms a good key to a depth which allows a thicker vitreous covering than usual, which, in any space where there is much traffic, is an undoubted advantage. The floor surface as laid affords a firm foothold without being too rough, giving one confidence of movement, which is not always the case with the ordinary marble tesserae.

Decorative Faience is very strongly represented by the leading makers, each adopting a very different method of expression. Taking them in order we are confronted by Messrs. Joseph Cliff & Son, whose potteries at Wortley produce some very attractive material for both building and decorative purposes. A facade of three openings for the side of a kitchen in glazed bricks of buff-brown and dull green looks very pleasant, clean, and cool, and two large circular-headed panels of floral design are highly decorative as well as satisfactory from a constructional point of view, for they are not veneered with thin tiles but are built up of thick blocks or cubes. As an example of the delicacy to which this ware can be brought, we noticed some bricks which are treated almost as china, for we have a sketch of Haddon Hall and a French landscape shown with very delicate drawing. Messrs. Wilcock, of Burmanstofts, show their usual strength, and have a very solid and richly massed array of capitals, friezes, tympana, and similar constructive material, which fully maintains the high reputation of this firm for colour and form.

Messrs. Doulton occupy a large space with every variety of their work, decorative and sanitary. The large pavilion requires but little comment; it catches the eye immediately, and is worth careful study. The very enumeration of the subjects so variously illustrated is in itself a long list. Painted tile panels representing figures, buildings, and industries are given in their happiest colour and line, showing great variety of treatment. Four corner exhibits show miscellaneous examples of good quality, and a Late Pointed window-head of terra-cotta of true line shows that the exhibitors are equally at home in a totally different direction. A red terra-cotta cornice also gives an example of form of work which is very suitable for decorative construction for external corridors and such places as require a more robust form of boldness of line and material than burned clay usually provides. A novelty is shown in their well-designed chimney-pieces entirely of glazed faience, including the fire-backs, so that the only other material required is iron to the front bars of the grate only. This absence of the accustomed fixings lends great richness to the leading portions, and stamp the whole as being decidedly rich and good. They also introduce a new ware which they call "Silicon"; like the Doulton ware, it is fired but once, and becomes of extraordinary hardness, which renders it capable of being used for steps and paving purposes, and at the same time it is worked in pottery forms, but not glazed. The same quiet tones of blue, grey, and brown are here adhered to although the steps look more like the red terra-cotta of a pale tint.

Passing down the East Central Gallery we find ourselves in another class, viz., XXVIII., but which contains many objects of a similar nature to those which we have already come across, and Messrs. Diespeker (803) make a very good show with their marble and glass mosaics of every description, from the large *opus incertum* to the humble *peperino*. They also show some drawings of pavements carried out for various architects, but these, as show-drawings, could and should be improved upon. Messrs. Drake, the concrete builders, exhibit their marble concrete, which we have noticed on other occasions. Messrs. Steele & Wood (813) show some very artistic painted tiles, some of the figure subjects in the long panels being very good; and this also applies to the Shaksperian subjects and single heads,

although the geometric tiles are somewhat hard and commonplace, and rather detract from the general value of the exhibit. Immediately opposite we see that Messrs. George Jackson & Sons have arranged some specimens of their fibrous plaster, which proves capable of very delicate modelling, which is shown in many ways in a very graceful Italian chimney-piece, of which the coving and panelling are good examples. The wall surface and ceiling are equally good, and evince careful study.

In Class XX. (Central Gallery) Messrs. Jackson & Graham (378) have arranged a bedroom and dressing-room suite, which is simple to severity in outline, and the woodwork and furniture painted plain white; there is an unnecessary asceticism about this, which may be healthful, but is scarcely pleasing, and the remarks of some visitors bear out this view. Messrs. Jenks & Wood (379) have divided their space into three bays, and show a sitting-room, ante-room, and bedroom, with fair effect. Messrs. Hindley & Sons show a completely furnished apartment, which is very pleasing, although the parts generally run very small; a panelled dado, with wall surface above, of Japanese leather paper, is surmounted by a frieze of Lincrusta which has been gilded, and on which is painted a number of rooks nesting and hovering round in various attitudes. This, generally, is too strong and heavy in line and colour for the delicacy of the rest of the work, which is very carefully considered, the wooden mantel-piece and wooden ceiling being refined and well worked, all the woodwork being painted white. A great contrast is shown by Mr. Samuel Litchfield (400), who has brought together a series of examples of a much heavier type, showing new and old woodwork of Elizabethan and Flemish character: there is a *bric-à-brac* air that spoils a few good pieces of woodwork which in themselves are fairly solid-looking and good in their way, such as we are accustomed to see when these pieces are worked up with care into their new surroundings. An oak chest, formerly among the extraordinary *mélange* at Strawberry Hill, is here shown; but like its eccentric collector, it would have been improved by a few leading lines in character. There is not a straight line in the ornament, nor an inch uncovered, "everything by turns, and nothing long." Messrs. Turberville, Smith, & Son (403) have brought some old Cairene woodwork to make an Eastern smoking-room, which is carefully and picturesquely arranged. The lattice, screens, rugs, divans, and miscellaneous furniture make a very pleasant picture of an apartment in a very practical Castle of Indolence, where the fatalism of "what is to be shall be" could be awaited with comfort.

A Conference on "Sanitary Legislation" will be held, under the auspices and management of the Social Science Association, at the International Health Exhibition, on Thursday and Friday, the 26th and 27th of June. Sir Richard Temple, bart., will preside, and the proceedings will begin each day at three o'clock.

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FACING BRICKS, of pure Terra-cotta.
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Marine Engines, and all kinds of Wood Working and other
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STAND 1211, Machinery in Motion, Western Gallery.
Patent Mechanical Appliances for Compressing Fodder and Model
of the
Patent Water Riser for raising water for domestic and other purposes by steam pressure.

LIGHTNING CONDUCTORS.
SANDERSON & CO. (Richard Anderson, Proprietor).
Consultants to the War Department.
Sole Inventors of the Solid Copper Tape Lightning Conductors.
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The Builder.

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Two Pamphlets on the Water Question.*



ATER supply is a topic of such engrossing interest at the present time to the inhabitants of London that notwithstanding all that has been said or written already, every fresh intelligent contribution to the subject is welcome and deserving of

consideration. Of the two latest pamphlets, that by Mr. Phillips Bevan must be regarded as a treatise summarising, in a popular form, the history of the water question from its earliest beginnings up to the present time, rather than as an exposition of any definite or original scheme for solving the difficulties connected with its improvement or extension. The Act of 1852 for making "better provision respecting the supply of water to the Metropolis," which the Board of Health succeeded in getting passed, is well characterised as "priceless in its value to the inhabitants of London, not only as being the first in which any real legislation was imported into the question, but as forming the basis of all future arrangements, the Magna Charta, so to speak, of the London water supply," inasmuch as amongst other important provisions it forbade any water being taken from the Thames below Teddington Lock or from any part of the tributary streams within tidal range. Its beneficial results, from a sanitary point of view, were speedily made evident when the companies were obliged, in consequence, to remove the sites of their intakes; though, if we are to judge from the lengthened discussion which took place at the Society of Arts on Mr. Percy Frankland's paper, the quality of the water still furnished to the metropolis has not yet reached that

standard of purity which Mr. Bevan considers it to be the vital interest of Londoners to procure. The chapter devoted to an exposition of the existing water companies contains many interesting particulars, which, though perhaps already enumerated by other writers at various times, have never been before brought together in so clear and comprehensive a review. The tables showing the net water-rates, working expenses (maintenance and management), and net profits of the companies during the past twelve years are very instructive, and can scarcely fail to convey to water consumers a somewhat uncomfortable sensation, that owing to the very loose legislation which Parliament has accorded to the water companies, the latter have become greatly enriched at their expense, and that, notwithstanding the victory of Mr. Dobbs, the rejection by the House of Commons of the Bill presented to it on the 11th of March has considerably neutralised the prospects of relief from what cannot but be considered an exorbitant price for the article supplied. Dissatisfaction will not only continue to prevail but will make itself heard, until the existing want of uniformity of basis for assessment has been remedied, and a more rigid supervision over the companies both as to supply and to charges has been established.

When 5,000,000 of human beings have to be provided with an essential necessary of life, it becomes intolerable that they should be at the mercy of any private associations, virtually holding monopolies within the respective limits of their operations. As an illustration of the great divergence in the incidence of rating the following summary is given of the average cost per house of the water supply of all the companies in the years 1820 and 1879 respectively:—

Company.	1820.	1879.
	s. d.	s. d.
New River	25 6	61 3
Chelsea	35 0	66 0
West Middlesex	47 0	61 6
Lambeth	16 0	50 9
Southwark and Vauxhall	—	40 9
East London	22 0	34 7
Kent	—	38 2
Grand Junction	57 0	68 0

The cost per house is, perhaps, scarcely the proper test by which to judge of the fairness or otherwise of the increase in the charges. A more correct inference would be drawn by comparing the relative volumes supplied at the respective dates coupled with the improvement in the services. Though that is not now possible, yet the anomalous variations in the prices charged by the different com-

panies will be apparent from the following statement, which has been compiled from the figures given in Mr. Bevan's tables:—

Company.	Daily supply in millions of gallons.		Price per 1,000 gallons.	
	1871.	1879.	s. d.	
New River	23.72	27.41	0	10 3
Chelsea	8.36	8.33	0	7 2
West Middlesex	9.35	10.43	0	10 0
Lambeth	10.42	13.57	0	8 3
Southwark and Vauxhall	16.42	24.03	0	6 06
East London	20.43	30.72	0	4 16
Kent	7.07	8.16	0	7 1
Grand Junction	11.12	11.75	0	7 5

But the most startling figures gathered from the same tables are those showing the enormous increase that has taken place in the amount of water-rates and net profits in the twelve years between 1871 and 1882:—

Company.	Increase in net water-rate, per cent.	Increase in working expenses, per cent.	Increase in net profits, per cent.
New River	55.00	39.00	80.00
Chelsea	50.00	20.00	28.00
West Middlesex	45.00	40.00	47.00
Lambeth	91.00	62.00	120.00
Southwark and Vauxhall	67.00	55.00	130.00
East London	53.00	45.00	42.00
Kent	77.00	30.00	111.00
Grand Junction	56.00	33.00	75.00

If a comparison be made with the previous table, it will be seen how very disproportionate the increase of profit is to the service rendered or value received by the consumer so far as any increase in the volume of water supplied, and to that of the working expenses incurred thereon. On what possible ground can such a result be justifiable?

Certainly it cannot be urged that it is within the limits of legitimate trading, and that the Companies have only got the best prices they could for their wares and made the best bargains possible. No one seeks to interfere with the law of demand and supply, but it is difficult to explain how that law has operated in the case of the Grand Junction Company, who, though they have practically added but little to the volume supplied during the past twelve years, have, nevertheless, increased their water rates by 56, and their net profits by 75, per cent.!

While admitting the obligations which the community are under to the Companies, and acknowledging generally their endeavours to

* 1. "The London Water Supply, Past, Present, and Future." By G. Phillips Bevan, F.S.S. London: 1884.
2. "Metropolis Water Supply." By Richard Hassard, M. Inst. C.E., and A. W. N. Tyrrell, M. Inst. C.E. London: 1884.

meet the increasing requirements of the metropolis, the public naturally object to give the "blank cheque" which, under existing legislation, the Companies seemingly think they have a right to demand, and hence they will have to face a continuous agitation until the existing anomalies are removed, either by competition or compromise.

There is, however, a still more serious problem yet to be solved, and that is, from whence is the supply to be obtained to satisfy the rapidly-increasing population of the metropolis? Granted that the existing supply is not of that theoretical or actual purity as will stand the chemical or microscopic test of the analyst, though even on these points experts differ; yet even the most ultra exacting purist can scarcely assert that the health of the metropolis is at the present day seriously affected by the quality of the water as it issues from the Companies' mains, and that whatever proportion of the actual mortality may be attributable to the water is not rather due to subsequent contamination. To secure a sample of water perfectly devoid of the presence of every morbid germ is, however theoretically desirable, certainly beyond the limits of practical attainment. Schemes, therefore, which professedly, for the purpose of accomplishing this end, advocate an extraordinary outlay, are certainly not those which should be entertained. It may be admitted that the nearer the source the purer the stream, though in the case of deep wells even this axiom is not necessarily true, and, therefore, if adequate supplies are obtainable therefrom some extra expense may be justifiable. Mr. Bevan states that within what may be called the home radius no less than nineteen different proposals have been at different times brought forward by persons of more or less authority. Of those enumerated by him, the scheme proposed by Mr. Bailey Denton of tapping the upper portions of the tributaries of the Thames, and at the same time intercepting the sewage for a certain distance up the course of each stream, tends in the right direction. But besides what may be termed the "Home Schemes" there are some which Mr. Bevan has named "North-country Schemes," the most extensive of which is that projected by Mr. Bateman to obtain a supply from the mountainous districts of North and South Wales, and for which he estimates the cost of a daily volume of 230,000,000 gallons at 25,000,000*l.* Costly as Mr. Bateman's scheme is, yet, by being based on the system of storage of flood-waters, it confers a double benefit to the country of those water-sheds by diminishing the destructiveness of the floods through the valleys, and securing a seasonable volume of water during the dry weather.

Two other proposals of drawing a daily supply of 287,000,000 and 130,000,000 gallons costing respectively 13,250,000*l.* and 7,000,000*l.* sterling, are mentioned by Mr. Bevan, as well as one from the Derbyshire Hills for supplying 100,000,000 gallons per day at a cost of 5,000,000*l.* The outlay on these three projects thus ranges from 54,000*l.* to 47,000*l.* per million gallons. In the three last schemes, however, two essential principles in connexion with water supply are lost sight of, namely, utilisation if possible of the resources within the watershed of the district to be supplied, and economy in cost. The first is more likely to secure the second than if recourse is had to distant sources, and this seems more especially applicable to the Thames basin, which is the largest in the country, with a rainfall manifold more than is requisite for every purpose, if only care be taken to store the surplus at the right season. If storage is to be resorted to anywhere, it would seem the most reasonable as well as the most economical course to utilise the supply nearest at hand. The proposals made by Messrs. Hassard & Tyrrell appear more in accord with those principles, for the chief feature in their scheme is to collect a supply of 120 million gallons in the first instance from the tributaries of the Thames, next to supplement it from the springs in the Salisbury plains, and afterwards to complete any deficiency from the Welsh rivers.

The cost of their proposals compares unfavourably with those before mentioned, as it ranges from 54,000*l.* to 72,000*l.* per million gallons. In addition to its costliness the weak points in this scheme, as in most of those proposed within the limits of the Thames basin is a further abstraction from the sources on which the summer flow of the Thames is dependent. The existing water Companies have already trenched to the utmost on the limits of that flow, and if the navigation of the Thames is to be preserved, not another cubic foot should be allowed to be abstracted in the dry season. Messrs. Hassard and Tyrrell do in effect acknowledge this, as part of their proposals is, "to impound a portion of the surplus spring waters of the winter months." But in so doing they will only be reducing the navigable depth of the upper Thames at an earlier date than it would otherwise be affected. As storage then must apparently form a prominent feature in any scheme, it is the rainfall itself that should be stored at the time it occurs. The obstacle to resorting to this obvious measure seems to be the idea of securing a supply of water of theoretical and, we cannot help adding, imaginary purity. The strong common sense contained in the remarks of Sir R. Rawlinson in the discussion on Mr. Percy Frankland's late paper will commend itself to the judgment of all practical men, and will, we hope in the end, prevail with the Legislature when the question of the future supply of the Metropolis has to be finally solved.

NOTES ON EARLY PLASTERING AND PLASTERERS.

The use of plaster, or "plaster" as it was formerly called, is of early date, even in the British Islands, in connexion with domestic architecture. Long before lime plaster came into general use, a tenacious clay or sticky and unctuous earth was employed when procurable, and, in its absence, whatever clay or mixture of mud and earth produced the most binding material. The rudest and coarsest forms of daubing or plastering in the British Isles were those structures erected of wattles and daubed over with clay to keep out the cold. These kind of domestic buildings were common in Ireland in the time of Henry II. From necessity or in conformity to the fashion of that country, the English monarch erected, according to Roger Hovenden, a royal palace with "uncommon elegance" of smoothed wattles in 1172, and in such buildings his Majesty with the kings and princes of Ireland solemnised the festival of Christmas. The Devonshire "cob," a class of building not yet extinct, is a fair illustration of the ancient fashion of daubing or plastering practised in this country for long centuries. In the thirteenth and fourteenth centuries in this country the plasterers proper and the daubers formed two distinct classes of building workmen, and their wages, like the wages of other operatives, were subject to certain regulations summer and winter. The daubers were simply the layers-on of a mixture of straw and mud to a frame-work of timber. The plasterers in London in the 24 Edward III. (1350) were bound to take no more for their working-day than the Feasts of Easter and St. Michael than 6*d.*, without victuals or drink, and for the remainder of the year 5*d.* Upon feast days, when they did not work, they took nothing. The masons and carpenters received similar pay. As a curious contrast with rights claimed by building workmen in the present day, those of the fourteenth century were allowed nothing for making or mending their tools. We know what fierce disputes took place within the last quarter of a century on the question of "grinding money," and how it was at last acceded to by the employers that a workman about being paid off was allowed a certain time for grinding or sharpening his tools, with a view of being prepared for his next job. The dauber or inferior plasterer of the fourteenth century received only 5*d.* per day from Easter to St. Michael's Day, and 4*d.* for the rest of the year. The daubers had labourers to attend them as well as the tilers, and these

labourers received only 3*d.* for one part of the year and 3*d.* for the other.

At an earlier period in the preceding reign, in the 10 Edward II. (1317), we have an interesting agreement concerning the plastering of the hall of John de Bretagne, Earl of Richmond. From an earlier document the residence mentioned would appear to have been situated in the locality of Ivy-lane or Warwick-lane, near St. Paul's. Thus runs the agreement of the master-plasterer of the fourteenth century:—"Know all men that I, Adam le Plaster, citizen of London, am held bound to Sir John de Bretagne, Earl of Richmond, to find plaster of Paris, at my own proper charges, good and sufficient, without default, proper for the hall of the said earl, and also that I will competently, at my own proper charges, plaster and complete the said hall, and will repair the walls of the same with the said plaster, well and befittingly within and without, as also the towels [the *louvre*s or *flues*] to the summit, in such manner as befits the repair of the hall aforesaid; and this I will do for 24 pounds sterling, which my lord the said earl has paid to me beforehand. Faithfully to perform the which work within eight weeks from the day of the Holy Trinity next ensuing, I do bind myself and all my goods, houses, and tenements, namely, my lands, houses, and tenements within the City of London being, to distress in part of any bailiff of our lord the king," &c. Plaster of Paris appears to have been used in England long before this period, but whether its use preceded the Norman migration, and how long, we cannot say. Native gypsum could supply a fair material in the absence of the imported article, and there are several beds of it in different parts of the kingdom. We have further mention of the plasterer or dauber and his wages in an account of moneys expended by a trustee on the repairs of a house in the parish of St. Michael, Cornhill, in the 33 Edward III. (1359), viz.:—"For 12 cartloads of lom [loam], 4*s.*; for 9 sacks of lime, 18*d.*; for 3 cartloads of sand 12*d.*; for one workman's wages for daubing, 9 days at 7*d.* per day, 5*s.* 3*d.*; for his man the same time at 5*d.* per day, 3*s.* 9*d.* Again, in an account of expenses incurred by the representatives of the City attending the Parliament in the 13 Richard II. (1389), the plasterers, or *daubers*, put in an appearance. "For timber and carpentry, tilers, and *daubers*, in preparing the house for their lodgings, as well as the chambers as the hall, buttry, kitchen, and stables for horses; and for making *stoles* and *fournes* [stools and forms] throughout, and for carting out the rubbish, such house being quite ruinous; as also for payment made to the good man of the house for said lodging, 6*l.* 9*s.*"

The antiquity of fresco-painting, even in its older forms, shows that the services of the plasterer were in requisition at a very early date in Rome, Athens, Egypt, and other places. In the Mediaeval period fresco-painting in connexion with our ecclesiastical and other edifices was pretty general over the three kingdoms. In the fifteenth century the windows of cloisters in England, as well as France, were not only filled with scriptural stories, in series, in stained glass, but the walls were sometimes painted in fresco. The walls of our Mediaeval castles, as far as the state chambers were concerned, were covered with wainscot, painted in fresco upon the panels, where not otherwise hung with tapestry. The churchwarden renovators of our ecclesiastical buildings in the seventeenth and eighteenth centuries destroyed by their whitewashing processes many fine specimens of wall-painting and fresco-work. In some instances, careful manipulation on the part of artists and architects has succeeded in saving the fresco-painting, but in many cases the thin coat of plaster forming the ground of the painting unfortunately came off with the coat of outside whitewash. An older system of plastering, known as *pargeting*, or *pergeting*, was once very general. The term, as it is known in the present day, only applies to coarse plastering inside chimney-flues, and between joists of floors. Formerly *pargeting* was understood in several senses: sometimes it was plain plastering, but generally it was

used in connexion with ornamental work, including mouldings, figures, foliage, and various other enrichments, sunk and raised. The Elizabethan half-timber houses exhibited on their exteriors ornamental parterring betimes. In different towns throughout the kingdom houses formerly of the date to which we are referring displayed small figures, and canopies surmounting them, executed in plaster work. The plasterer may put in a claim for much good work in the past as well as an alliance with distinguished artists. The plasterer, in the case of fresco painting, had always to be in readiness to render the wall with a coat of coarse stucco, formed of lime and sand, which was finished over with a finer material to produce the requisite surface for the artist. Though the ancients were ignorant of the use of oils and varnishes; the fresco-painter, from the very nature of his work, had to evidence marvellous dexterity and skill, rapidity of execution, and a truly educated eye, all these being essential in the efficient performance of his labour. His subordinate the plasterer, no doubt, felt an inward pleasure, at least, that he prepared a good ground or basis for the successful work that resulted.

Of the class of plaster work known as stucco proper, there are several excellent examples in England and Ireland generally attributed to Italian artists, several of whom were encouraged to settle in these kingdoms by members of our native nobility and some others interested in architecture.

In London and Dublin, in the old town mansions and in numerous country seats, there is often splendid stucco ornamentation to be met with in ceilings, mouldings, chimney-pieces, &c. From the latter end of the seventeenth century and throughout the whole of the eighteenth century a very large amount of stucco ornamental work was executed throughout the three kingdoms, and though a portion of it must be put down to the hands of Continental artists, still we have evidence enough to show that our native workmen or artists in stucco often rivalled the foreigner in this class of plaster work. To one Margaritone, who died early in the fourteenth century, is credited the invention of stucco work. At intervals down to the end of the last century he was succeeded by a number of clever stucco artists. The names of a few stucco artists or workers of more than ordinary repute, who practised their art with fame and profit in London and Dublin, may be found in looking into some local histories. There is an inferior kind of stucco work well known to our modern builders and plasterers, made up of common mortar and plaster, which is applied to the outside of houses. This kind of stucco or "compo" if well made and manipulated will last for several years, but the ordinary mixture called "stucco" has no tenacity, and a few nights' frost signs its death warrant. Such constituents as a composition of pulverised white marble, mixed with good plaster of lime, well sifted and wrought up to a proper consistency with water, show at once to the practical mind that the essentials for executing lasting work are present.

The half-timbered domestic buildings, or cage-work structures, so plentiful in London up to the date of the Great Fire, afforded not a little work for plasterers, though the general run of the work of the more common and numerous class of these buildings consisted of filling-in the interstices of the frame work with plaster. The cornices, instead of being run in plaster, were often of wood, and put up by the carpenter and joiner; but when brick-built houses became general in our cities and towns, the house-plasterers by degrees secured a fair share of the work. Throughout the reign of Anne, and extending into that of George III., window and door finishings, wall panellings, dados, subbases, and even cornice ceiling work, being to a great extent executed in joinery, left little for the plasterer to do, compared with a later date, when a reaction again set in for plaster work instead of wood. The field of the plasterer is once more invaded by sundry innovations in modelling, casting, joining, and laying-on, and the disciples of the Queen Anne school are bidding the joiners

cheer, as wood again will be in the ascendant (if they have their way) from skirting to ceiling line.

Old building practices, like national pastimes and customs, take a long time to die. The builder of the mud cabin still flourishes in portions of her Majesty's dominions, and the thatcher still turns out good ornamental work, as well as the tiler. After long centuries the "cob" wall constructor, the dauber, the rustic carpenter, the hedger, and the dry-wall field mason still vegetate, and find paying patrons. History of a verity is repeating itself, for have we not men coming forward again to prove that reeds are better than laths for plaster work, forgetting that our great-great-grandfathers used the vegetable growth, and never thought it worth while seeking a patent to protect its use?

THE MANCHESTER SHIP CANAL.

The promoters of the Manchester Ship Canal are to be congratulated on the successful result of their long and hard-fought struggle. The seemingly stringent condition with which it was supposed the permission to their Bill had been accompanied, to the effect that no work is to be commenced until five millions of the capital have been *bonâ fide* subscribed, was, it appears, a suggestion thrown out by the promoters' leading counsel, and as such it will not only serve to increase the confidence of the public in the scheme, but also to show that much of the opposition which has been made to it on the score of costliness has been groundless. That opposition has tended to accentuate the mischievous feature in our legislative proceedings in connexion with works of public improvement. That in order to meet objections many of which, as is apparent from the evidence given before the Special Committee, were of a vexatious and frivolous character, it should have been necessary to expend a sum of 100,000*l.* shows what necessity exists for reform in this respect.

There are doubtless many wild schemes of questionable utility set before the public, into which a rigid inquiry would prove a valuable safeguard, and on which perhaps the prospect of an expensive legislative contest would act as a deterrent; but still, on an occasion of what may be termed almost a national work,—for what affects one of its chief commercial centres must more or less affect the nation itself,—there surely ought to be some limit to the costliness which these Parliamentary inquiries involve. The individual and collective conscience of the present Government professes to have been so sorely shocked at the corrupt practices at elections, that they have laid down a *Perso-Medic* enactment for saving the pockets of the nation's future representatives from the immoral proceedings of electioneering agency. There are certainly rumours of vast sums having been expended in furthering party interests in important boroughs; but it is to be doubted if any single constituency has mulcted its representative to the extent to which the Manchester Ship Canal promoters have been fined before they could acquire the right of executing, not a party manoeuvre, but a national enterprise. Cannot the Legislature then, which has been so mindful of the interests of its members, and careful as to the purity of its electors, devise some remedy for the protection of the promoters of such valuable enterprises as that now to be inaugurated at Manchester? Every fresh instance of costly legislation of this kind serves to confirm the opinion before advocated in our columns of the necessity for some central controlling authority for dealing with all water questions, by whom the necessary preliminary investigations could probably be made at a title of the outlay which, under existing methods of procedure, it seems almost impossible to avoid.

The cheers with which the decision of the Lords' Committee on the Bill was hailed on the 23rd inst. have awakened hearty echoes in Lancashire. It is impossible for those who have not recently visited

Manchester to realise the enthusiasm which is felt in that great capital of the cotton industry in behalf of the canal. The single fact (which is stated on p. 239 of the report of the Select Committee on Canals, 252, 1883) that it cost, in 1882, more to convey a bale of cotton from Liverpool to Manchester than it did in 1829, before the opening of the Liverpool and Manchester Railway, may be said to summarise the case for the canal. The main contention of the opposition, apart from matters which may be subject for compensation, was that the canal would not be practicable for large ships, and that the estuary of the Mersey would be injured by the works proposed. As to the first point, the whole traffic from the Mediterranean to the East passes through the Suez Canal, which is only three-fifths of the proposed width of the Manchester Canal, and of which the curves are sharper. As to the latter, without going into the question of conflicting evidence, it may be permissible to express a hope that on the passing of the Bill for the Ship Canal the Liverpool authorities will so far reconsider their position as to effect a union of all parties interested in the Mersey navigation for the purpose of dealing with the present bar of the river, and securing a permanent channel from the deep water at Garston to the five-fathom line outside Forney Point. If Liverpool can secure this, she may well be content to be united with Manchester by water as well as by rail, to the mutual advantage of the sister cities.

NOTES.

THE objects of the Railway Regulation Acts Amendment Bill (which is divided into seven "parts") are (1) to render permanent the Railway Commission constituted by the Regulation of Railways Act, 1873, and to extend and define its jurisdiction; (2) to give certain additional powers to the Board of Trade; (3) to enact that the terminal charges claimed by the railway companies shall be submitted to the Commissioners, but that, when allowed by them, they shall not be exigible until the company has submitted to Parliament a revised classification of rates, and until the same shall have been approved by Parliament; (4) that the provisions of section 15 of the Act of 1873 (which are altered by clause 21 of the present Bill as to railways) shall apply to the terminal charges of a canal company, and that every canal company shall hand in an annual return (not including any statement of traffic) to the Registrar of Joint-Stock Companies. The points which will probably excite most opposition are the proposal to transfer to the decision of the Commissioners,—at the option of a court of Quarter Sessions,—any rating appeal to which any railway company is a party; and the failure to attempt to ensure anything like unity of charges on different railways. The great question of terminals is simply shirked by the Bill.

FURTHER fighting about the Wellington Statue in both Houses towards the end of last week was quashed by the First Commissioner; and rightly. The question has been argued out at almost greater length than it merited, and seeing that a majority of both Houses, as well as the Queen and the present Duke of Wellington, had approved the course now arrived at, Mr. Shaw-Lefevre was fully justified in saying that he considered the matter closed. "De gustibus est disputandum," by all means; but within reasonable limits. We quite agree, however, that more care should have been taken to carry on the dismemberment of the present statue under a decorous veil; the operation becomes somewhat painfully ludicrous after all the tall talk on the subject.

SIR ROBERT PEEL, on the same evening, called attention to what he considered the unsatisfactory purchases made by the Royal Academy with the funds of the Chantrey Bequest, and inquired whether this was not a national trust in regard to the administration of which Government could interfere. Mr. Gladstone appeared to think that the Academy

were masters of the situation, and this we imagine is the state of the case. Sir R. Peel gave notice that he would call attention to the matter at an early date. Without accepting the right hon. baronet as an art critic, we think that the purchases this year have been by no means satisfactory, and public comment will perhaps have a wholesome effect.

The first reading of Lord Stratheden and Campbell's Bill for Smoke Abatement, supported by Lord Mount-Temple, passed on Monday evening in the Upper House without opposition. This is a first step, from which we may hope that something practical will result.

The principal groups of the Pergamene marbles are exposed to the public view in the Assyrian Room of the Berlin Museum. In addition to these, in the storehouses, out of sight, are masses of interesting fragments. Some of the architectural remains of the Stoa of Attalus are of considerable size and great beauty, and historically of no less interest than the great altar itself. Fresh additions are expected in the autumn of the present year, including a fine and well-preserved figure of a giant from the altar. The floor of one entire room is overspread with fragments of the lesser frieze. One slab represents a ship moored to the shore, and a figure descending to land, the motive and composition closely analogous to the landing-scene of the famous Ficoroni Cista. Perhaps the most interesting thing about this Pergamene altar is to watch its reconstruction. The actual work falls to the lot of Italian sculptors. It is their task to extricate the marble sculptures from the hardened mortar in which they have too often become embedded. It is a task requiring the utmost skill and dexterity. Once extricated, there remains the task of rearranging the fragments, and even the groups, into a consecutive frieze. A wooden revolving model of the altar has been constructed: each important fragment is photographed, and the photographs are placed in the blank space left for the frieze, where they can easily slide from place to place. Then begins the endless series of tentative permutations and combinations which from time to time yields some triumphant reconstruction.

The Cast Museum at Berlin is always a model of completeness. It has recently been enriched by casts of the curious granite reliefs found at Marasch, in North Syria. One scene occurs repeatedly, with slight variations. Two figures stand or sit *vis-à-vis*; between them is a table or altar, with, upon it, food or objects for sacrifice. These reliefs are of uniformly rude, clumsy style. Near them are placed casts of reliefs of much later date,—from the grave of Antiochos I., of Kommagene; from the Nemrudagh, in North Syria. A series of scenes are represented, among them Antiochos and Herakles, and Antiochos with Helios, Antiochos receiving fruits from a nymph. From Sakschi Gözn there are also casts of granite reliefs of Assyrian style.

The exhibition by "a group of artists of the French School" at the Dudley Gallery is of much the same character as that which we noticed last year, though not including quite the same names. In some cases quantity rather than quality seems the object; and some works, such as M. Joseph De Nitti's pastels of scenes in modern (very modern) life, really of admirable cleverness in their way, are simply preposterous in size, in comparison with the slight interest of the subjects. The great "First Communion," by M. Gervex, is a fine, well-composed scene, but it is a gigantic sketch, in fact; it is "purchased by the State," which can afford more wall-space for such works, perhaps, than most private persons could. M. Bonnat's "Portrait of Victor Hugo" is forcible and characteristic. M. Jourdain's "The Favourite Flower" is another magnified cabinet picture,—an interior, where a lady reclines on a sofa choosing flowers; a thing very finely composed, and showing great power of painting accessories effectively in

a broad and apparently rapid manner. M. Roll's rough method, which told well in his portraits of workmen last year, when applied to a life-size picture of a young lady disrobing on "the return from the ball," becomes almost repulsive; his study of a child's face in "Luncheon" is very good. Among small works, M. Jourdain's "Road to Quesnay" and "Under Cookham Bridge" are bright transcripts from nature, the former especially. The exhibitors, we understand, are responsible for the arrangement of the catalogue so as to present the greatest possible difficulty in the way of finding the titles of the pictures.

If all that is asserted of the Lalande-Chaperon-Spence Primary Battery should turn out to be true, it will rank as one of the most wonderful discoveries in the history of electricity. Each cell of this battery consists of a shallow iron tray, at the bottom of which is placed granulated oxide of copper, and a short distance above this is a plate of zinc, the whole being immersed in a liquid solution of caustic soda. No action takes place between these elements under ordinary circumstances, but when an electrical circuit is completed decomposition sets in and work is done. The oxygen of the oxide of copper combines with the zinc and forms oxide of zinc, and metallic copper is left behind. The electro-motive force of each cell is 0.94 volts, and a number of them coupled in series form a battery capable of giving a steady current for a considerable period, which may be used for lighting purposes or for supplying motive power. At the office of Mr. Fergusson, 31, Lombard-street, a number of incandescent lamps can be seen fed by such a battery, and the light is exceedingly steady, nor is there the slightest unpleasant smell arising from the action of the elements of the cells. It is claimed that "the value of the materials produced in the combination of the two elements yields a greater return than their original separate cost, and the electricity therefore costs nothing," although it performs a quantity of mechanical work in raising the carbon filaments of the lamps to a state of brilliant incandescence. Such a statement is so subversive of all our preconceived notions of natural laws that we should require very strong experimental evidence of its truth. The owners of the patents should court the most complete investigation, because any experimental installation of lighting, unlike all previous ones, would not only be no expense, —supposing their theory to be correct,—but would actually yield a profit.

THERE are no rooms in London more comfortable, nor better lighted, than those of the City of London Society of Artists, but a solitary spectator in a vast gallery filled chiefly with the paintings of immature artists, feels a sense of possession which is, on the whole, depressing. Many of the best things in the exhibition have already courted favour in the West. Sculpture, except in the artless form of portrait busts, is notoriously unsaleable; so it happens that some of the best sculptured works of the past two or three years are still in the market. Noticeable amongst these are the well-known "Artemis," by Mr. Thornycroft, and the great equestrian statue, "The Last Call," by C. E. Birch. Mr. Lawes is represented by a cool nudity, "Summer-time," in marble. Next after sculpture, water-colour art is least understood in the neighbourhood of the Guildhall and elsewhere; and so, in this department, again, there is some unpretentious excellent work which claims recognition. The average quality of the oil paintings is very low. Few really good artists send things worthy of their reputation, though many approved makers of pictures are largely represented. The interest of this section, such as it is, centres in the work of students. These, for the most part, are modest in enterprise. It is difficult to guess at the number of small fruit and flower pieces that are upon the walls. Many of them are good enough of their kind; but it is not a satisfying kind. A few pictures of higher interest are to be found, amid much that is weak and aimless.

THE organ at Westminster Abbey was repaired last Saturday by a special service, and a "recital" afterwards by the organist (Dr. Bridge). The instrument was originally constructed by Schreider & Jordan in 1730; it was added to by Elliott in 1830, and by Hill in 1848 and 1868; it is now completely rebuilt and considerably enlarged by Messrs. Hill & Son, the present representatives of the old firm. The organ now forms two lofty masses on either side of the choir screen; the canopies of the case, when complete, will reach to the height of the triforium; but the Chapter have, wisely on the whole, spent their money in the first instance on the instrument itself, and the elaborate case which Mr. Pearson has designed is waiting till funds can be raised to defray its cost, stated at about 1,500*l*. The central space over the choir-screen is now clear, and in the centre of this the keyboard is placed, so that the player can see and hear the choir well, and can form a fair notion of the effect of the organ, no part of the heavy pipework being very near to him. The refinement of seating a player so that he can really hear the organ as the other listeners hear it has seldom been attempted, though it is now only a matter of mechanical appliance. The connexion between keys and pipes is maintained by tubes to which, on pressing the key, wind under pressure is admitted, acting on a small bellows at the other end of the tube, which, on being thus inflated, pulls down the valve or "pallet" admitting the wind to the pipe. Some of these tubes are of great length, but the action is instantaneous, and it has the advantage of being little liable to derangement, and not being affected by changes of temperature. The main bellows are in a vault in the cloisters, and driven by a gas-engine, the air being conveyed to the organ by three iron pipes passing underground, of lengths of from 60 ft. to 100 ft. Part of the heavier portion of the pedal organ is on the ground-floor, behind portions of the choir screen. The organ has now four manuals, and fifty-six speaking stops, some of which were the special gift of individuals. The effect from a musical point of view it is not our province to go into, beyond expressing unqualified admiration for some of the new stops, and general but not quite unqualified admiration of the total effect.

From a list of tenders sent to us, it seems that engineering firms, as well as building firms, are subject to strange differences of opinion in the matter of estimated cost of work. For "four new penstocks, four steel sewage troughs, and thirty-two pump-rod connexions," for the Metropolitan sewage works at Crossness, six firms sent in tenders, of which the highest was 9,700*l*. and the lowest (accepted) 4,890*l*!

THE ninth annual exhibition of paintings in China at Messrs. Howell & James's is of much the same character as its recent predecessors. It is almost entirely a ladies' exhibition, and consists mainly of more or less clever attempts to paint on china subjects only suited to oil or water colour, with a very few works which show a perception of the proper style of conventional treatment for this branch of art. As specimens of the right kind of thing we may cite "Conventional Arums" by Miss Innes Hadden (273, 286), "Decorative Design" by Miss K. Clarke (280), "Plaque in Italian Style" (336), by Miss Ellen Welby, a really fine thing, deserving the silver medal presented by the Crown Princess of Germany for the best work by a Lady Professional, which has been awarded to the artist. The other awards are such as tend to encourage conventional design, but few seem to aim at that.

The Architectural Association.—The fifteenth annual excursion will take place in August. The locality has not yet been definitely settled, but particulars will be duly announced. Members wishing to join should communicate with Mr. Charles Richard Pink, hon. sec. for the excursion, Castle Hill, Winchester.

ARCHITECTURE AT THE ROYAL ACADEMY.—V.

AMONGST the examples of domestic architecture the chief interest undoubtedly centres in Mr. Norman Shaw's "Dawpool, Cheshire" (1,250 and 1,302). This fine work is illustrated by a group of plan, elevations, and sections, and another comprising four perspective views, two exterior and two interior, all drawn by Mr. Lothaby, and, consequently, shown to the best advantage. The plan is a somewhat singular one and would scarcely be recognised at a glance as coming from Mr. Shaw's hand. His special marks are not upon it, or, at least, are not instantly discernible. The "hall," of which he generally makes a leading feature, dwindles, in this example, to the "entrance-hall" of ordinary plan, and an apartment of very moderate dimensions is cheated of its fair proportion by an encroaching porch of unpretending, not to say mean character. But the loss of the "hall" is made up by a magnificent picture-gallery, as large, perhaps, as a small parish church. We can only get at its real dimensions inferentially, for the drawing is without a scale, and, more provoking still to the earnest student of domestic plan, is without a north point. One of the interior views is of this gallery looking towards the entrance. The screen at the corridor end is divided into five unequal bays by elliptical arches resting on stilted and stumpy columns, fluted, and with that exaggerated entasis in which this artist sometimes indulges. Above, and nearly at the level of the springing line of the elliptical ceiling runs a gallery, enclosed by a rather weakly-designed balustrade. Some thin and poor brackets support a commonplace cornice; but these defects are amply atoned for by a band, some 5 ft. or 6 ft. deep, of Jacobean ornament, in low relief, filling the space above the heads of the arches and between them and the cornice. This ornament is designed in the architect's boldest manner, and although a purist might object that its fantastic strap work and cornucopie are *apropos* of nothing, mere ornamental padding, it is of its kind superb and immensely valuable in the composition as a means of diversifying a large expanse of otherwise flat surface. This peculiar form of ornament, though often copied by the imitators and followers of this architect, is never so happily used as by himself. The arched openings in the screen are filled in with attenuated balusters,—in brass, as we have heard say,—and in the head of the open doorway, through which one gets a glimpse of a sunny staircase, some wrought-iron work of characteristic excellence flourishes. The elliptical curve of the ceiling is divided by longitudinal ribs into five bays, and the three central bays are filled with glazed sashes. The side bays are again subdivided by vertical ribs into squares, and the spaces are occupied centrally by smaller squares adorned with figure-subjects in low relief. This part of the design does not exhibit Mr. Shaw's artistic power at its best, and either his hand has been altogether absent, or the master sometimes nods. At the opposite end of the apartment, and only seen on plan, there is some artful contriving,—a jutting fireplace nook and a staircase leading to a small chamber over it; the beauty of this little chamber and its accessories can be relished, although but imperfectly expressed in the drawing. The complete separation of the billiard-room suite from both the house proper and the offices is a noticeable feature in the planning as is also the provision of a lift and ample lift-room. The drawing-room is a long and narrow gallery-like apartment, such as we very much enjoy; but it is warmed (?) by only one fire, and that at its southern end. Indeed, it is a special feature in this plan that all the fireplaces are at the ends of the rooms or in corners, and the equable warming of the rooms has either been overlooked, or, as is more probable, has been purposely disregarded. The interior of the dining-room is a complete carrying out of an idea which appears to pervade nearly all this architect's work; it is almost impossible not to believe that we are in the presence of a genuine old example of an English country mansion of the sixteenth century, which has received subsequent additions, and upon which some more modern notions of comfort have been engrafted. The ashlar walls, irregular almost to rudeness, appears in the window jambs and above the wainscoting, while in places the roughness of the material is covered up, as by a

sort of after-thought, by obviously affixed panels of silk damask.

The chimney has a most inviting look,—a lintel some 10 ft. or 12 ft. long rests upon two stumpy bulgy Tuscan columns of dark marble. The soffit is carried some feet outwards, and the real fireplace is a recess in the wall beyond. It is fitted with quaint "dogs" and a cast-iron fire-back; and there are the customary little peep-holes of windows commanding, we may be quite sure, a pleasant stretch of landscape, or dainty flower-garden, at the least.

The exterior of the house is quiet and reserved, even to ostentation. Rows of plain stone gables of low pitch and varying span, plain parapets, slightly embattled, capacious unadorned bay windows reaching up to and carrying round their summits the lines of parapet, mullioned windows high and many-transomed, or long and low, sturdy masses of chimneys carried on boldly-projecting breasts, make up a design of great power, and such as no contemporary architect has as yet quite succeeded in accomplishing in the same style so surely and so successfully as Mr. Shaw. But, with the sincerest admiration for his skill, we cannot go the length of admiring the little useless toy-pinnacles which sit astride of some of his parapets, and we can but regard the manner in which he gives, by the sagging of his tile roofs and the wavy lines of his ridges, and such like little artifices, the look of age to his scarcely-completed work, as little better than architectural immorality. He is strong enough to afford to dispense with such tricks as these, and by resorting to them so persistently he sets a bad example to younger men. Indeed, the Academy walls this year, as previously, reflect these mannerisms, and are taken by some members of the school which Mr. Shaw has founded as of the essence of his teaching. No one has as yet caught the real secret of his success,—his mastery over grouping, his exquisite feeling for detail, and the versatility which each year adds new charms to his always charming works. The school of which he is the head would no doubt linger on awhile when his light is withdrawn, but as yet no one has appeared amongst his pupils who gives promise of perpetuating the best qualities of the master.

Below the Dawpool sketches hangs No. 1,249, a house at Sheen Common by Mr. Colcott, and in his well-known manner. It is a small and perfectly unpretending country-house, and shows how well an architect of real ability can afford to dispense with all external ornamentation. This modest half-timbered structure gives promise of an eminently snug and comfortable interior, and is a worthy example of the national type of an Englishman's house.

The restoration of Ingatstone Hall (1,297), by Mr. Birch, is a very powerful drawing, and the architecture is interesting as showing how purely Renaissance detail, as in the central doorway and cupola, and purely Tudor detail, as in the windows and gables, may be made to harmonise. The front is sternly symmetrical in plan, and the elevation is an instance of a very free treatment of a stately type. The result is in every way effective and satisfactory.

Design for Bedford County Club (1,295) by Mr. Aston Webb, is an extremely pleasing and well-studied design; and, so far as can be judged from the perspective drawing, well adapted to its purpose. The building fronts the river, and on each floor a long balcony affords an agreeable lounge to the members. The lower balcony is enclosed by an ashlar parapet, quite plain, the upper one by a light wrought-iron railing, elaborate and well designed, the floor supported on magnificently-carved brackets or cantilevers. Rough-cast gables at each extremity of the façade are pierced by elliptical windows with a little free ornament around their margins, otherwise the gables are left quite plain, giving full effect to the busy range of mullioned windows beneath them. A wooden cornice, with plain horizontal blocks under the cornice, runs along at the eaves affording a sparkling line of light and shade at the junction of the roof and wall. The chimney-stacks are boldly designed, and are well raised above the ridge, and a central ogee-headed cupola gives unity to a very artistic composition.

We congratulate Mr. Justice Bowen on his "Colwood, near Cuckfield," by Mr. Halsey Ricardo, and shown in a very beautiful drawing, No. 1,303. There is, unfortunately, no plan, and there is little in the architecture which calls for special description. It is said to be the perfection of certain dishes that no one flavour shall

predominate, but that the result shall be agreeable. An agreeable result has here certainly been attained with the simplest means,—mullioned windows of Tudor type, barge-boarded gables, quite plain and half-timbered framing, with none of the fantastic dodging which makes so many well-meant efforts to follow in the steps of our wiser forefathers. To us the right-hand portion of the structure looks as if it was older, and formed the original house to which Mr. Ricardo has largely added. If our conjecture be correct, the architect will give us credit for some astuteness in making the discovery; if incorrect, he will take our mistake as a compliment, and a sincere testimony to his skill in reproducing faithfully some of the best characteristics of Old English domestic architecture.

EXHIBITION OF WORKS IN WOOD IN CARPENTERS' HALL.

THIS exhibition, which was opened formally by the Lord Mayor on Friday, the 23rd, but not to the public till Monday last, is the first of its kind under the joint direction of the Committee of the Carpenters' and Joiners' Companies, two of the old City guilds of trade, though only nominally representative in the present day of the crafts whose names they bear. It is probably owing in a great measure to the public cry for the reform of the City guilds, and the desire to enlist their aid in the cause of technical and industrial education, that we owe the present exhibition, as well as other action in the same direction on the part of other of the companies. Whether the City guilds will eventually have to undergo a radical reorganisation to fit them to present wants we will not stop now to discuss. It is pleasing in the meantime to see that some of them are already conscious of their responsibilities, and are trying to give reasons why they should be permitted to exist. The exhibition in Carpenters' Hall is not a large one, yet it contains a considerable number of exhibits in carpentry, joinery, fancy furniture, carvings, drawings, &c. Exclusive of the loan collection, the works specially prepared and sent in for competition are not numerous, unless, indeed, we enumerate the small objects on view here and there, and which are, in fact, only details or portions of larger works prepared to illustrate special features. We may say at once, before proceeding further, that the catalogue is the weakest point in the present exhibition, and this has often happened in previous industrial and art displays. The classification is mixed and confusing, and the information of a most meagre kind, consisting of little more than the name of the objects and exhibitors, and the number. The exhibits are arranged for effect and are not in sequence, so the numbers run zig-zag from one side of the long tables or stands to the other, thus entailing a marching round to examine in succession objects in the same class; indeed, in sundry cases the examiner will have to pass from one room into another, backward and forward, if he wants to view consecutively a particular class of exhibits. An excuse may be urged on the part of the company that it is their first exhibition, and that exhibits were coming in till within less than a week of the opening, and in consequence the catalogue had to be hurriedly printed with all its sins of omission and commission on its head.

Having said so much by way of preliminary, we will proceed to describe a number of the exhibits, but before doing so we may observe that the prizes offered by the companies were divided into five classes.—1st, for constructive carpentry; 2nd, for constructive and ornamental carpentry; 3rd, for joinery of all descriptions (which of course included some fancy cabinet work); 4th, for carvings in wood, which were to be handicraft or hand work, not machine work; 5th, models in wood, or drawings of existing examples, ancient and modern. The successful prize-winners have their exhibits ticketed, showing their success in their respective classes as winners of first, second, or other awards. On the first long stand as you enter the larger room are ranged models of roofs, sent in for competition, along with two or three lent models of roofs long since executed. No. 3 is a model of hip-roof, which wins a first prize in its class, by Mr. Robert Williams, who also contributes drawings for hip-roof. This is a well-constructed model; the hip-rafter cooking at angle of wall-plate to take the seat of rafter;

the purlins making a perfect fit against hip-rafter; and the section showing the jack and other rafters on, are all well executed. The drawing or plan shows the correct method of getting the length and "cut" of the rafters and other framing timbers, and thus affords a technical lesson to young workmen. No. 4 is a model of dome of coffee-room, Great Eastern Hotel, Liverpool-street, by Mr. W. T. Dale. This model gains a second prize. The construction shows an outer octagon glazed dome with louvre for ventilation, glazed atop, and an inner open panelled-work iron ornamental dome. No. 5 is a model of a roof, by Mr. C. N. McIntyre North, designed some years back. Here it is endeavoured to combine in the construction the excellencies of the hammer-beam roof in respect to loftiness of effect, and the diagonal braces in tying in the principals. In order to remedy what is said to be the defects of the hammer-beam construction, a diagonal tie is introduced. The diagonals tie break joint, and have pieces of oak in between, which break joint the reverse way. No. 6 is a model of roof with king and queen posts, braces, rafters, struts, purlins, and principal rafters. The framing is well and cleanly handled. This model is by Mr. C. Gibson, who also sends in a mahogany bracket specimen of barge-boarding, pattern of moulding, with two specimens of mortising and one of scarfing. The latter three specimens are awarded medals. No. 7, model of a high-pointed roof, with drawings, illustrative of same, is by Mr. W. W. Gillett (a first prize). This is an open-timber roof, so framed that it affords a high-valued space underneath. It may be termed a barrelled roof, with curvilinear ribs springing from corbels on each side, joining with the principal rafters, and cross-braces higher up, to which they are bolted at intervals. A king-rod ties the joint-framing, passing through the rib, cross-braces, and heads of principal rafters, embraced at top by iron socket. This roof combines lightness with strength, while affording a space of considerable altitude underneath. The drawings show longitudinal and cross sections, cantilevers, moulding, and other details. No. 8 is simply a model of a king-post, showing girders and a pair of principal rafters. It is the work of Mr. W. Trott, an apprentice, and a drawing by the same accompanies the model. It is very commendable for an apprentice hand. Nos. 1 and 2 are lent exhibits, being models of roofs of Great Hall, Lincoln's Inn; Public Hall, Harrow; Gymnasium, Harrow Schools; and St. Andrew's Church, Havering-hill. The first-named was lent by Mr. S. J. Nicholl, architect, and the last three by Mr. C. F. Hayward, architect. As these have done public service already it is not necessary to describe them; although their construction may be studied with advantage by young carpenters, particularly that of the ornamental roof of the Great Hall, Lincoln's Inn.

A selection of drawings, some descriptive of roof construction and other carpentry, masonic and carving details have been lent by the Royal Institute of British Architects, the Royal Architectural Museum, University College, and a number of well-known architects. These drawings are an acquisition in an exhibition visited by building workmen; but as they have been more than once on public view already, and to a great extent illustrated, their description here may be dispensed with. The City Architect, Mr. Horace Jones, lends the fine model of the roof and *flèche* of the Guildhall.

Coming to the section of competitive exhibits comprising doors, windows, and sashes, there are a number of articles exhibiting considerable constructive skill, as well as some of average merit. There has been an evident desire on the part of a number of the exhibitors to excel, and a few have been very successful. No. 25, a model of pair of mahogany doors and frame (first prize) and also drawing on hand-railing by Mr. G. Collings. This competitor is author of a recently published small treatise on hand-railing, and, being an experienced staircase hand, he has developed to some extent a method of his own applicable within certain limits. The door frame is circular on the plan and head, or face and top, but the pair of doors are only circular on the face, and the fan-light above the door is of the double curvature. This is excellent work, and evidences technical knowledge. Wherever work of this kind is executed it bespeaks an acquaintance with practical geometry on the part of

the executive workman. No. 27, a model of Gothic door in walnut, by L. Hobbs, an apprentice (second prize). This small model shows stop-chamfered work on the framing and raised panelled work within, with some ornamental fluting. No. 13, a sash and frame and also a door by Mr. Arthur McFarlane, twenty-one years of age. The exhibits are meritorious. The sashes are secured by a barrel sash-fastener, the invention of the exhibitor. The door is a raised panelled one, moulded and cleanly finished. The back of the door is what is termed bead and flush panelled. No. 36, model of door and frame, by Mr. G. Greenfield, well worthy of a prize, but it arrived too late for competition. The model is in oak, the raised panelled somewhat elaborate. The jambs of the door are deeply splayed, and show panelled in harmony with the door. The splaying is continued round a circular soffit, and the whole is an exceedingly well-executed piece of high class joinery work. No. 10, model of sash and frame circular on plan and head, in mahogany, by Mr. H. Terry. The sash opens on a central pivot the concave and convex sides of the frame show outward splaying. The exhibit is fairly executed, and is one of a class that requires skill in its setting out and construction. No. 11, model of sashes and frame, circular on the face. The bottom sash reaches two-thirds of the height of frame; the other third is filled by a fan-light, circular-headed, abutting against the lower sash, but stationary. No. 96, a weather-tight window, by Mr. J. D. Tucker (first prize). The novelty here is that a circular hollow bead of elastic is sunk to half of its diameter in a groove in the underside of sill of bottom sash, again in a groove on the rabbet of meeting-rail of top sash, and also in a groove in head of top rail of upper sash. These beads of elastic contract or relax as the pair of sashes are opened or shut, in the former case securing air-tight construction. Constant wear and tear, however, will necessitate the beads being replaced, just as new sash cord has to replace the old. In sashes made of hard wood and varnished, the elastic beading will be more serviceable than in those made of deal or pine. In badly-fitted sashes, of course, the elastic beading would be of little use, as the air would make its passage around the parting slips and tops of wood securing the sashes in their place. The window and sashes in the present instance, with all their belongings, are of superior finish. No. 98, a model of window-sash intended to show an improved system for taking out the sashes for cleaning without removing the parting slips and stops, and thus obviates the danger attending the cleaning of windows. The model is by Mr. T. S. Simpson. By pressing back the quadrant-shaped catch or appliance the pulley stile on the right-hand side of window is moved back sufficient to allow freedom for the sashes to be lifted out with their cords attached. The system, though somewhat ingenious, cannot be recommended for general use. There is a weakening in the construction where there ought to be strength and stability, and a little wear and tear would soon develop a very shaky and unsatisfactory state of affairs particularly in the general run of dwelling-house windows and sashes.

Among the competition exhibits or models in staircase and handrail construction there are a few of high merit, and some others possessing noticeable features. There seemed a desire on the part of all the contributors in this class to send in models of circular staircases, single and double, with their handrails. Work of this kind bespeaks geometrical knowledge, and some experience. No. 12, a model of staircase, with accompanying drawing, by Mr. J. Nelson. Starting from the level, there is a short flight to a platform landing, the handrails on either side springing from square panelled newels. From the platform the rest of the way up to the summit the stairs become double, branching to the right and left, with outer and inner handrails. The flights terminate atop on a balustraded landing. The construction would answer where a number of rooms or offices had their doors opening on a circular or other shaped landing, lighted by a lantern or glass roof. The work is excellent. No. 14, two wreaths or handrails, illustrating the method of working them, by Mr. C. Vernon. The springing and other lines are marked on the wreaths, and the work shows an experienced hand. No. 15, model of circular staircase, by Mr. Robert Jones, author of a work on hand-railing. The model is in mahogany, the flight ascending from

the level, with handrails on either side springing from scrolls. Well executed is No. 16, a circular or spiral staircase, in satinwood, by Mr. W. Ey. The treads and winders show inlaid panel-work, and there are inner and outer handrails. In respect to this and other staircases and handrails, we would prefer to see them fresh from the workman's hands and tools, without any polishing and varnishing. No. 17, model of double or twin spiral staircase, by F. W. Boorman (first prize). Here there are ascending and descending flights of stairs within the same circle which on a large scale would allow ample head room where one crosses the other. The model is in oak, and although the handrails and balusters are not in their place (the model being unfinished in this respect), it is fully entitled to the prize awarded. The work is of a very superior kind, and evidences high-class constructive skill. No. 18, a model of twin spiral staircase, by Mr. Wm. Booth, in mahogany, with double handrails, starting from scrolls, well executed. No. 20, spiral staircase, with double handrails and balustrades, by Mr. C. H. Balls. The handrails, which are of mahogany, start from turned newels, the treads or steps being of oak. Fairly well executed. No. 21, model of circular staircase, by Mr. W. Proctor (second prize). There is a single hand-rail and a wall string. The spiralling framing at bottom, and the balusters are picked out with colour, and this system of colouring we would prefer to see absent. The treads or steps are of mahogany, but the staircase as a whole, though possessing merit and evidencing skill, has a too fanciful appearance. No. 22 is a somewhat odd model of a staircase, as far as plan or design is concerned. The handrail springs from scroll, and the stairs start at level with a number of winders, and the flight in its passage passes round well-hole, with winders, there being no half space or landing until the top is reached. We cannot say much for the plan, but the work withal is cleanly and fairly executed.

Among the models of churches (No. 30) is that of the Parish Church of Sheffield, alongside of which there is also a model of Shrewsbury Hospital, by Mr. S. Wright. The curiosity about this piece of handicraft is that it contains over 20,000 bits of wood, taking the constructor twenty months of between four and five hours a night to complete it. The parts are put together solely with glue. A model without exhibitor's name or a number, but stated on a written slip to be Trinity Cathedral, is presented as the result of four years' spare time. The several parts are put together by very small screws. The design and construction partakes of the style known as the Carpenter's Gothic of the Batty Langley School of the last century. Among other strange constructions is a model of St. Paul's Cathedral. Though not without some merit, it is an elaborate piece of toy architecture. It is enclosed in a glazed frame in the second or smaller room. The model is made of an enormous number of small pieces of wood, portions from a birch-broom. The pieces are fastened on with the points of small pins. Patience, indeed, is a virtue! No. 34, altar railings by Mr. F. Haasle, showing cinquefoil open work at bottom and geometrical tracery at top in harmony. This was a first prize, and it is a well designed and executed piece of Gothic work. No. 35, a model of a chimney by Mr. Charles Farley (extra prize) executed in mahogany, Classic in details, or rather of the Domestic Classic and of the Queen Anne or Early Georgian period. No. 24, model of centring as used in the construction of Waterloo Bridge. The abutments are also shown, with several of the courses or vousoirs. The model is very well executed. This model of centre arch is by Mr. H. N. Wood, and gains a first prize in its class. The fourth table, or long stand in the large room near the platform, comprises for the most part, fancy furniture exhibits in the form of table-tops, glove and handkerchief boxes, and model of piano, by F. Spalding, jun. The small octagon table-top is a fine piece of elaborate and skilful inlaying, with various coloured woods. The inlaid work represents 38 articles, including among others, hammer, saw, key, shuttle, prayer-book, paper-knife, folding rule, scissors, level, vice, callipers, pipe, and other tools and articles of domestic use. The articles lie about in the greatest confusion, overlapping each other in many

instances, but all, of course, perfectly level with the surface or basis. This is clever work in very bad taste. Alongside is another but larger inlaid table, octagon-shaped, and showing an elaborate system of inlaid work. The last-named is exhibited by Messrs. Smee & Son. The inlaid table exhibits are continued into the smaller room. Nos. 62 and 63 are inlaid tables, exhibiting high-class workmanship, by Mr. Henry Huntley and Mr. G. Beard. The second table is inlaid for the most part with lighter-coloured woods or veneers, home and foreign. No. 59, a fancy inlaid table by Mr. J. White, very meritorious. At No. 111 is shown a table, with inlaid ebony and ivory, a second inlaid with camwood and boxwood, an inlaid hand mirror, and one inlaid mirror framed. All are contributed by Mr. Richard Arkwright, and all exhibit good workmanship. The collection of fancy furniture and carved work, panels, screen, boxes, figures in wood, and a variety of other objects, Persian, Japanese, Indian, and Chinese, lent by Messrs. Pare & Co. would need a long article to describe even in brief detail. The specimens of Japanese joinery, looking in the distance like fretwork, but all put together by the hand, show marvellous execution. No. 68, a carved panel by W. D. Mavor, jun., apprentice, gains a silver medal. The stems and leaves are handled with great freedom, and stand boldly up from the panel in relief. Most creditable work, indeed, for a youth, and one full of promise. No. 67, an ornamental bracket, and a second carving of cow and calf, by Mr. J. P. Smith. The bracket is carved from the solid, showing two birds perched together on branch and foliage, cresting around head of bracket. The cow and calf are a very natural bit of carving, but both exhibits are very meritorious. The subject of No. 65 is the "First Flight," a carving in lime-wood, by Mr. W. Jenkins. It represents a number of birds just fledged, some of which have taken flight and are sporting or resting on surrounding hedge-rod branches and rivulet stones below. Two young birds still remain in the nest, but are seemingly on the point of departure too. The parent birds are also introduced into the subject. If not of very high-class execution, yet the "First Flight" is very naturally rendered, but it is not of a description of carving that would live long outside a glass-case, as time and exposure would quickly destroy its present good effect. No. 76, the City of London arms carved in lime-tree wood, by Mr. W. Howes, shows facile treatment or freedom in handling, though still an unfinished work. Some specimens of carving, lent by Mr. G. A. Rogers, representing dead birds, are very good; and those alongside, lent by Mr. H. Farquhar, particularly the small dead bird in glass case, is very fine. The bird, suspended by a string from a nail driven into some rustic framing, demands attention. The bird, the thin string, the nail, with other accessories, are carved from the solid. The string stands out clearly from the back, and the bird barely touches it in any part. The most exquisite bit of delicate and dexterous carving, to be seen in a glass case near the doorway, is a dead canary. This, though exhibited more than once, like some other carvings on view, is nevertheless worthy of careful inspection. The carving is in pear-tree wood, and is the work of Demontreuil, a carver who died young, but who in life enjoyed the patronage of Louis XVI. and Marie Antoinette. The bird is suspended from a nail by a string, and it must be a marvel to many how such a fine line as the string could be cut by the carver in wood, standing out clear from the background of panel. The bird in itself,—indeed, all its belongings,—exhibits the same of wood-carving of its kind. No. 53, carved figures of Mars and Venus, by C. J. Male. The figures are well executed. There are, in the small room where the carvings are on view, a number of exhibits of an antique kind, lent by different persons, dating back three and four centuries. Among those of a noticeable character from Mr. Rogers's collection are a pair of small doors of a buffet in dark oak, from Nuremberg, date 1450, in the style of Albert Durer, and a Gothic door to cupboard, carved with vine, &c., fifteenth-century work. The old ironwork, locks, hinges, and other fastenings, are an instructive study. No. 80, a carved altar-piece, by M. Brabam, sixteenth century, "The Apotheosis of Don Emanuele." On each side of this altar-piece are specimens of carving in dark oak supposed to represent Henry VII. and Queen.

Although we have not exhausted our notes relating to competitive and prize exhibits, much less loan objects, we must draw our notice to a conclusion. We have, we think, made a good and varied selection from the objects as a whole. We must not omit to state that 100 specimens of wood, in panels, are on view, lent by Messrs. W. Cubitt & Co., illustrating the various home and foreign woods used in joinery. The same firm contribute sundry specimens of joinery. A smaller collection of wood panels has been lent by Messrs. J. J. Greenwood & Co. Both of these collections will prove instructive to carpenters, joiners, cabinet-makers, and other wood-workers. A number of drawings were sent in by competitors, explanatory in some cases of their models in the carpentry and joinery classes, but we regret to say these all remain rolled up in sheets, and there seems to be no room or space for examining them. We ventured on unfolding some of them, but had to do so on the floor. Some arrangement should have been made for displaying them, if only in justice to the competing workmen, adults and apprentices. We forgot to mention in the course of our notes that there are some lady contributors, apprentices and otherwise, who sent in meritorious objects, which may be seen on view. The single exhibitors reach about 140, but the separate exhibits are not far from 500. The following gentlemen acted as judges of the objects sent in competition for prizes:—Mr. Edward L'Anson, F.R.I.B.A., Mr. H. Trollope, Mr. Thomas Rider, and Mr. J. Wells Browne. The report of these gentlemen, when issued, will afford full information about the prize-winners. The exhibition will be kept open till the 14th of June, from eleven to five, and till nine on Wednesdays and Saturdays.

FURTHER NOTES ON THE BURLINGTON CLUB DRAWINGS.*

FOLLOWING the Classical drawings on the north side of the room come in natural sequence the drawings of Renaissance work, not very numerous; and the end and south side of the room are chiefly devoted to drawings illustrative of Gothic. Among the former may be noted two large and fine water-colours by Thomas Allom, showing "A Design for Improving the Property on the Banks of the Thames between London and Blackfriars Bridges" (82, 63), which were exhibited at the Royal Academy in 1846 and 1848. This is, in fact, an anticipation of the Thames Embankment scheme in a much more decorative fashion; an architect's rather than an engineer's design, with colonnades and elevated terraces along the bank. In this part of the room are some of the original drawings for "Nash's Mansions," rich and fine in colour; and in contrast to these are some small but very carefully-executed drawings by Thomas Malton, water-colours, but in a very low scale of colour, and representing the special qualities of purely architectural drawing, hard, clean, and precise; the object being to show with strict accuracy the architectural detail and topography of the scenes; three of them represent the "Great Court, Somerset-place," and were engraved in Malton's "London and Westminster" (1796). A little further on is a very interesting drawing by Turner (77), "Sketch of a Building in London after a Fire," supposed to be the drawing exhibited in the Royal Academy in 1792 as the "Pantheon, the Morning after the Fire." This is a drawing combining powerful effect with evident accuracy, and it records an incident practically interesting in relation to fire-resisting materials: for the columns, apparently brick, are shown with nearly all the cement burned off them, only some partial patches remaining. Now cement and plaster have recently been much spoken of as protective against fire, whereon Turner unwittingly supplies a comment.

Paul Sandby's two drawings of Windsor Castle, in their cold and unreal colours, may be contrasted with Nash's in their superfluous warmth and brilliancy; each errs a little from truth, Nash from a voluptuous use of a rich palette, Sandby from having no such warm or varied chromatic scale at his disposal. A series of small Cambridge illustrations by T. A. Bell and F. Mackenzie (sepia, 94, 95, 124), are good examples of correct topographical work; some of these were engraved in Le Keux's "Memorials of Cambridge."

* See page 680, ante.

Some pencil drawings by Prout are, to our thinking, more truly artistic and architectural in style than his coloured drawings; they are admirable examples of the combination of accuracy with free touch, and of the power of conveying a great deal in comparatively few lines, and giving fulness of effect by a broad pencil line. Frederick Nash's large and highly wrought "Interior of Westminster Abbey" (107), at the top of the room, is worth attention, though rather artificial in style. Some little water-colours by the late Mr. Perry, "St. Nicholas, Caen," and "Le Mans Cathedral," (120, 121) are charming examples of truthful, delicate delineation of Mediaeval buildings: a larger and bolder one by the same hand is, "Gateway, Athelhampton" (140), less an architectural than an artistic drawing. The purely artistic way of looking at architecture is finely illustrated in Cromek's very fine drawing of "A Norman Doorway" (138); this is quite sufficiently finished in detail, but evidently the author's joy was in the rich and varying colours of the masonry, which he paints as if he loved it. Architectural colourists should not pass over this drawing.

There are some drawings on the south wall more remarkable for size than for real importance. Among the finer ones, Turner's interiors of "Westminster Abbey" and "Ely Cathedral" (166, 175) are examples of his work at a time when he would draw and paint architecture with almost the conscientious exactness of an architect; considering them as architectural drawings, they are exceptionally good and effective, but were executed before Turner really became Turner. Girtin's "Jedburgh Abbey" (178) illustrates his apparent inability to draw a building of this class straight and in true perspective, a characteristic we remember noticing when his drawings formed a special collection at the club, especially in a certain view of Lichfield Cathedral. No works in this part of the room are more remarkable for the unity of architectural precision with feeling for colour, than a few by Mr. Street, more particularly a "capital" from the arcade of the "Doge's Palace" (185), which is unsurpassable. Another admirable architect's drawing is F. P. Cockerell's interior of "San Paolo fuori le Mura" (191), a monochrome drawing, showing a rare combination of correctness and effectiveness, in a free style of handling; it is essentially an architect's work, but without a touch of the hardness and prosaic character too often found in otherwise excellent architectural drawings. David Roberts's "Transept of the Church of St. Miguel, Xeres" (189), a small, richly-coloured work, is purely an artist's drawing; the effect is to some extent artificial, as much of Roberts's work was, but exquisite in finish and management of the slightly stazy lighting.

On three screens in the room are various drawings of a slighter description than most of the others. Among the most interesting of these are a few examples of Blore's drawings. These explain at once why his restored Gothic work—very good for its date,—has that hard, wiry effect, which at once distinguishes it either from genuine Gothic or from the work of the best recent Gothic architects: yet they are beautiful in their way. They are entirely in line, executed in the finest and cleanest lines with a very sharp pencil; they are drawings which none but an architect either would or could have made; and they form a very poignant contrast, as to method in pencil drawing, with the Prout pencil drawings above mentioned. With Blore's effect is nothing, accuracy every thing; with Prout there is accuracy, as far as delineation is carried, but effect is the first object. The remainder of these screens contain various drawings and sketches of more or less interest by Coney, Augustus Pugin, Charles Wild, Sir C. Barry, and others.

Among the drawings in the writing-room which have not already been mentioned, is a design for an altar-piece by Inigo Jones (293), which we overlooked before, and several drawings by Decimus Burton for the Hyde Park arch and entrance, and also a design (298) for an arch to form the head of a special royal entrance to Buckingham Palace, apart from Constitution Hill. This is an arch of much the same type as the other and existing one, and is inscribed "Ang. 16th: Received back from the Right Hon. Sir Charles Long as approved by His Majesty, to be put in execution, with the exception that the windows shall not be

diminished at the top." In this point His Majesty, or those who advised him, showed better perception than the architect, who had inserted windows with sloping jambs which do not at all accord with the main lines of the design. San Gallo's remarkable design for St. Peter's is exhibited in two large drawings, elevation, and half elevation half section; these are lent by the Queen, and form perhaps the most interesting item in the whole collection. Two small and powerful decorative sketches by Sir James Thornhill are to be found (304, 305), and an interesting sectional drawing, copied by Mr. Penrose from one of Wren's at All Souls' College, showing a proposal for retaining a portion of the Gothic cathedral in the new building.

Architects and lovers of architecture will, we hope, not omit the opportunity of studying this interesting collection of the drawings of their predecessors. Members of the club who are specially interested in it are surprised at the little attention it has received from the non-professional press and from general visitors. This is to be regretted; but when we consider how very few persons there are who can understand the interest of an architectural drawing, or who have the slightest idea whether it is good or bad, one can hardly be surprised that the present exhibition is not so attractive as others that have been held at the Club.

MODERN BUILDING IN INDIA.—DOMES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following is a report of the discussion which followed the reading of Mr. Emerson's paper (see p. 743, ante):—

Mr. R. F. Chisholm, in opening the discussion, agreed with Mr. Emerson as to an architect's difficulties in India generally. There were immense difficulties connected with learning the art of an architect in that country. It was to be hoped that the Government would do something practical in this direction. They had the most magnificent pictures, and photographs, and general descriptions, but if an architect had to design a cupola in the native style he had, perhaps, to journey 300 miles to find a model. Until, therefore, practical things were put into the hands of architects, it would be impossible to design satisfactorily, in the native style. This was the great difficulty connected with work in India; the architect felt, when he had finished a design, he could have done much better if he had been able to avail himself of similar works to those which the architects had in this country. In domical construction they had to consider that in most of the old domes the supports were solid, or the dome was supported on columns, with solid walls to take the thrust. This would hardly do for modern requirements. A dome had sometimes to be constructed of a complicated form, with room open on every side, and this made the problem a little more difficult. If they had stone to work with this might easily be done, but in general brick of an inferior description was used, and under these circumstances they had to cut the dome to the lowest possible range of stability. It was almost an impossibility to construct a dome which would look well from a distance, and also when seen close at hand, and he did not know any dome which was perfectly satisfactory from all points of sight. But by running it up high, and forming straight lines at the top, the top of the dome was not missed until one came close up to the building. If a minimum amount of material was desired, the dome should be tied, which might be done by having a series of iron ties in the curvature of the dome, at right angles to its curvature, connected inside by a tie, and with suspended weights, which latter would be naturally raised or lowered, according to the temperature. If this principle were adopted domes might be constructed with a small amount of material, and yet be at the same time perfectly safe. He had taken great pains to construct the dome at Baroda College, having first made a large model, which had stood perfectly. In India these domes got intolerably hot, but by having a double dome a perfect system of ventilation was ensured.

Mr. Aitchison, A.R.A., remarked that they were very much obliged to Mr. Emerson for his interesting paper. They would be glad also to know the methods of construction he used in the dome, and also the methods of centring. The Florence dome was put up without an internal centre, but that was all they knew about

it, and they knew nothing of how they prevented the upper crust from falling down. They knew nothing about the construction of the dome of the Pantheon, which was not, properly speaking, a dome at all. It was, however, interesting to learn the difficulties which the Romans found, and the way in which they endeavoured to overcome them. When Adam published his work on the Palace of Diocletian, he wondered how the Romans carried out a series of what would be called discharging arches, when the whole thing was covered with plaster. For many years he was unable to conceive what could be the reason. The scaffolding was an important item in the expense, and the Romans were anxious to save this as much as possible. The solution of the question how the work was done was due entirely to the late M. Viollet-le-Duc, who had explained how it was built in this series of discharging arches. Not one-third of the weight was put on the scaffolding. He believed the Roman system of building the whole of the curved surface with rubble in horizontal courses was still in use. He concluded by proposing a vote of thanks to Mr. Emerson.

Professor Kerr thought the science of dome-building was one of the most refined problems of their art. He was quite disposed to wish with Mr. Emerson that dome-building could be introduced into this country as the key-note of a better style of architecture. He was sorry that Mr. Emerson should have introduced so much iron into one of his own domes; Mr. Chisholm did not appear to have introduced much. Mr. Emerson's dome, he understood, was built of concrete made by Lascelles, and there was iron used in the construction. That might be very well for India in the present day, but he would not like to see it introduced into Mr. Emerson's new style of thirty years hence. The principle of construction involved in all domes seemed to be that primarily used by children in building a grotto of oyster-shells. It was not a question of variation of joints exactly, but of overhanging corbelling, such as the Greeks used, and poising the structure by that means until it could be crowned if desired. Mr. Chisholm's dome seemed to be a very sharp pointed arch, composed of rings, which locked themselves inwards. It was easy to understand how the plaster could proceed course after course. The stone was capable of being bonded in itself. The speaker then referred to the dome of St. Paul's, the sham construction of which was, he said, simply a scandal to Sir Christopher Wren. He would be sorry to see any one erecting a dome like that of St. Paul's to crown a large building in this country. A dome required no tie, being its own tie if it were bonded together ring by ring. Therefore in theory the construction of a dome was very simple. He did not see why architects dealing with large works should not sooner or later strike out a new path, and it might be in the direction of domical buildings.

Mr. Woodward was simply astonished at Professor Kerr's criticism of St. Paul's. Had it not been for the inner cone the architect would never have been able to support the exquisite lantern. It seemed to him that the dome of St. Paul's was a marvel of construction.

Mr. Stannus was a little disposed to join issue with Mr. Emerson, for he did not like the manner in which iron construction had been spoken of. With regard to monumental effect, there would be opportunity between the ribs to fill up the spandrels and other portions with concrete, which might be covered with tiles. They should not, as architects, set their faces very strongly against the use of ironwork, for if they would not use it other people would.

Mr. Tarver was afraid that iron construction without protection would come out very badly in case of fire.

The Chairman then put the vote of thanks, when it was carried by acclamation.

The Chairman added that Sir Gilbert Scott was strongly of opinion that domes might be made a valuable feature of the future, and be used with very great effect. He was astonished that Professor Kerr should speak as he had done of St. Paul's. Notwithstanding what was called false construction, he could not help thinking that Sir Christopher Wren was right in the construction of this most beautiful dome. He remembered reading about the construction of the dome, and of the horror Sir Christopher had of iron work in connexion with it. But he put a complete chain bond at the foot of the great cone, which fulfilled all that

was wanted in the internal dome. London would not be half so beautiful if we had not that splendid dome.

Mr. Emerson, in returning thanks, said that in the North-west Provinces of India stone was the material used, and the building he had referred to was constructed of marble and good stone. As to hanging live weights inside the dome to counteract the thrust, that was somewhat like his suggestion. It was partly on account of the difficulty of centring that he had introduced iron. There was not much to fear from the expansion and contraction of iron. As a matter of practice, for a bar 24 ft. long, exposed to the heat of the sun, they only allowed one-eighth of an inch. Engineers of great experience had told him that if iron were covered with a tile or some thin material the expansion and contraction would be next to nothing. For that reason the iron was embedded with the concrete. It was the difficulty of centring which caused him to go in for the combination.

JOHN THORPE AND THE ENGLISH RENAISSANCE.*

We have made Thorpe out, therefore, to be an active architect with a magnificent connexion, embracing many of the leading men of the time. [An interesting question would be, how did he get it? But to this we can give no answer, but surmise. He may have been sent to Italy by one of his patrons, as John Shute was by the Earl of Northumberland, there to pick up a knowledge of Italian work, and to acquire, as he says, "the tricks and devices as well of sculpture and painting as also of architecture." At any rate Thorpe seems to have succeeded better as an architect than did Shute, who is only known by his book on the "Chief Founders of Architecture."

Or he may have studied in France. There is no doubt that he closely studied Androuet du Cerceau. Not only did he copy some of his plans, but he took them all very much to heart, and not improbably borrowed the idea of four corner pavilions from him. There are several of Androuet's plans with these features, but the earliest of Thorpe's, in which they are really developed, is Wollaton Hall (1580-1588), Androuet's book having been published in 1576.

It would seem also that Thorpe was much struck with some of the fantastic designs in the French book. There is one of a hexagonal building, having a projecting arm on each alternate face; another forming a cross with a large pavilion at the end of each arm; another pentagonal on plan; and another circular. In Thorpe's book we get a few very similar schemes, but only two are known to have been carried out, viz.:—Langford Castle and Lyveden New Building; and of these the former is said to have been taken from a Swedish Castle.

But though Thorpe was evidently much affected by Androuet du Cerceau, he did not blindly copy him either in his plans or his elevations. The English plans differ in many respects from the French; and though the general idea may in some cases have been borrowed, the working out is always on English lines.

There are, roughly speaking, six types of plan to be found in the book:—

1. One or more courtyards, as at Burleigh.
2. A range of buildings with a wing projecting at each end at right angles.
3. A long range with few or no projections.
4. A central block, with a pavilion at each corner (the French type).
5. A small compact plan.
6. Quaint designs made to look well on paper rather than to be useful.

In almost every case the principal feature is the hall; and in almost every case the entrance is at the end of one of the long sides of the hall, and is divided from it by a screen,—the plan universally adopted in that age. There are a few exceptions to this rule, in which the hall is entered otherwise than through the screen, but they are not many. The vestibule formed by this screen gives access on the other side to the buttery and servants' apartments. There is, however, very little scientific planning, and economy is not studied in the least. The only points attended to are these:—One side of the house is occupied by the family, the other by

* Continuation of a paper read by Mr. J. A. Gatch before the Architectural Association on the 17th inst. See p. 764, ante.

the servants, the common meeting-ground being the hall; generally near the latter is the kitchen, and adjoining the kitchen we always find the dry and wet larder, the pastry and the surveying place or serving place. Upstairs is the gallery, almost invariably made as long as the building will possibly allow. When this is said, everything that can be has been said, for the care bestowed on the planning of most of the houses. The staircases are always fine features, and are frequently lavishly supplied. But having once arranged the great eating chamber and its dependencies, and the gallery, Thorpe gave himself little trouble about the rest of his rooms; the parlours and bedrooms came,—like the colour of the hair of Benedict's ideal sweetheart,—as it pleased God. They were all thoroughfare rooms, and many of them opened into the courtyard. They seem to have been allotted in a haphazard fashion according to the space at command, and the space at command was frequently regulated by some fantastic notion about the plan.

The consequence of this is that as men's notions of comfort advanced they either had to put up with much inconvenience, or else had to add corridors, or else simply pulled their Elizabethan houses down and built anew. Apothecary Hall, which is built round two quadrangles, is, according to the testimony of the inmates, a most inconvenient house, though charmingly picturesque; Burleigh has had a corridor put round the court; Wollaton, being more compact, is much more comfortable, but it requires a very large staff of servants.

In fact, Elizabethan houses were meant for a large staff of servants; they were built for display. In those days of royal progress, enormous crowds of gentlemen and their retainers had to be housed at once. This entailed a large hall for dining, extensive arrangements for cooking, a long gallery for receptions, and a multitude of bedrooms, or "lodgings," as they are called.

Bawn, in his essays, published in 1598, i.e., about the middle of Thorpe's career, gives us his ideas on the building of large houses. He requires a side of the palace devoted to the banquet, or feasts and triumphs, and the other to the household, or for dwelling. These are to be "uniform without, though severally partitioned within." Then there is to be a great and stately central tower, with "goodly leads upon the top, railed with statues interposed." The stairs are to "be upon a fair and open newel, and finely railed in with images of wood cast into a brass colour; and a very fair landing-place at the top." "Embossed windows" are strongly recommended, especially in the country; "but let them be but few, four in the court, on the sides only." The court itself is not to be paved, "for that striketh up a great heat in summer, and much cold in winter; but only some side alleys with a cross, and the quarters to graze, being kept shorn, but not too near shorn." In each corner of the court is to be a staircase cast into a turret. Beyond this court is to be another, cloistered all round, and containing private bedrooms and galleries,—“whereof you must foresee that one of them be for an infirmity, if the prince or any special person should be sick, with chambers, bed-chambers, antechambers, and recambers, joining to it.” There are to be three other courts in the front of the house, the first green, the second likewise green with an embellished wall, the third cloistered on the inside with pillars. “As for the offices, let them stand at distance, with some low galleries to pass from them to the palace itself.”

A great deal is also said about minor matters, about cupolas and fountains, “and all other elegancies that may be thought on,” but the gist of Bacon's instructions is contained in the foregoing extracts. How far, it may be asked, do Thorpe's plans embody these ideas, expressed by a contemporary pen? His larger houses carry them out more or less completely, though none of them exactly answer to Bacon's description.

Audley End comes, perhaps, as near as any. We have there the two main courts, one in the midst of the house itself, with a staircase in each corner; the other cloistered and with lodgings round it. The offices, too, are apart, but connected with the main building by a low gallery, and as for the cupolas and other “elegancies,” Evelyn, who saw it in its prime (1654), declares it “shows without like a diadem, by the decoration of the cupolas and other ornaments on the pavilions.” But though

no one plan contains all that Bacon would desire, they all fulfil more or less his requirements. The staircases on fair and open newels; the leads railed with statues at intervals; the fair grass courts; the cloistered walks, and the embowed windows.

The “partitioning within” of the various wings is also in accordance with Bacon's ideas. On one of Thorpe's plans is a suite of rooms called a “nobleman's lodging”; it comprises “his antechamber,” “servants' lodging,” and a room for “wood, cole, and privy.” Every house, large or small, to which there is any writing, shows a kitchen, dry and wet larder, and buttery. Most of them have bakehouse and pastry, surveying place, and pantry. A few having a bolting-house, a scullery, a pantler's lodging, a butler's lodging, a small room labelled “pewter,” a “boylng-house,” and a “spicery.” One has a day-room for servants, another a “hall for hynds,” another a “wayters' chamber.” These are the chief servants' apartments. For the family we have the hall, summer and winter parlours, and the gallery, sometimes replaced by a “great chamber”; we find also a “dying parlour,” withdrawing chamber, breakfast-room, “study,” library, and chapel; in one case a room for a “chaplen” with “his study” next it; also a steward's lodging, and adjoining, “his clerk.” There is, beside these, a title which, I venture to say, is never put on a modern plan, however suitable it might be. When Thorpe, in the exigencies of his quaint planning, found he had a space for which he could find no use, he boldly labelled it “waste,” and left it.

This list of apartments, though not exhaustive enough for the present day, nevertheless shows a great advance in domestic comfort from Mediaeval times. There was, however, as yet no scientific planning, and only a rudimentary knowledge of Aspect, as the following extract from John Shute will show:—

“Your principall chambers of rest and libraries and such other like must receive their lightes from the east, for that the sunne by natural heat at his rising draweth to him all corrupte humours and evil vapours of the earth, and quickeneth the spirittes of man and beast, and if ye will cast therein baynes or hot-houses, with winter chambers and parlours, they shall receive light from the west. For that side is defendid from the south winde which are greivous and contagious. . . . Your study places where you would write draw, or devise, or the places where your sellers should be cast, ought to receive their light from the northe, by cause in that parte are the lightes which are stedfast.”

The selection of the north for the apartments named is judicious enough; but the dislike shown to the south is not justified, and the peculiar properties attributed to that quarter and the east are of a piece with the medical knowledge of the times, which was not a little mixed with astrological fancies.

But, quitting the subject of plans, let us consider for a moment the architectural treatment of the buildings of that age. Thorpe's designs, so far as they survive, do not exhibit any striking peculiarities which mark them off from all others. He worked chiefly in stone, at any rate, so far as the moulded features are concerned. If he had a special mark by which his work may be distinguished, I should be inclined to say it is in the frequent introduction of heraldic shields; but possibly a further comparison of his work with his contemporaries might modify this view. His details are no better and no worse than others of the same age. It would be rash to say that he continually improved as he grew older, for Kirby, Audley End, and Slougham exhibit no marked differences in refinement. By far the purest work of his, or any buildings of the time with which I am acquainted, is to be found at Lyveden in the exterior cornices. It is an interesting question, which may some day, perhaps, be answered, as to where the Italian details actually came from, whether from sketch-books, or published sources, or full-size templates sent over. There are very few of the latter, to judge by the curious distortions which many of the various features underwent. Yet surely these distortions lend a piquancy and individuality which are wholly lacking in the tame correctness of a later age?

It is not difficult to trace home to Italy itself the cloistered walks, the entablatures, and the entrances; something very like them may be seen in almost any Italian town. But the chimneys, the gables, the windows (especially the bays) are surely of native growth? This, at least, all must admit,—that there is something essentially English about our Renaissance, especially about that period in which Thorpe worked. Kirby and Burleigh may not have the

purity of detail which marks the Banqueting Hall in Whitehall, but they smack much more of the soil.

Time will not permit us to enter the buildings and examine the interior features, and I should be departing from my text were I to ask you to do so, for Thorpe has no interior details at all, except the full-size of a handrail; but before I close I must just draw your attention more particularly to one or two of the houses to be found in his book. And first to Audley End. This is an excellent example of the magnificent scale on which the nobility used to erect their mansions in those days of building. The house as it stands now is very large, but it only covers about a quarter (or even less) of the original area. The kitchen was 52 ft. by 37 ft., and the parlour 57 ft. by 27 ft. There seem to have been no remarkable features about the exterior save the parapet, which, according to Evelyn, consisted of stone letters forming an inscription, such as exists at Castle Ashby and Temple Newsham. This enormous pile was erected by an Earl of Suffolk, who was grandson to Sir Thomas Audley, Lord Chief Justice (I believe) to Henry VIII., and who seems to have amassed a large fortune out of the lands of the dissolved monasteries. It was indeed the old monks' revenues which went to build many of the stately houses of England. Thorpe's connexion seems to have been largely among office-bearers. Lord Burleigh, Sir John Danvers, Sir Thomas Lake, Sir Percival Hart, and Sir Thomas Heneage, all largely depended on the court for their subsistence. Others of his clients were quite independent of office; for instance, Sir Francis Willoughby, the builder of Wollaton, which, as a composition, may be considered, perhaps, as Thorpe's masterpiece. The pavilions at the corners gradually increasing in richness as they ascend, the long parapet connecting them, and the grand mass of the central hall go to form a group which it is difficult to rival. The details are very characteristic; the cornices are somewhat coarse; the pilasters are duly proportioned, and have their bases ornamented with the gondola ring; while in the various niches are busts of Roman emperors, of Virgil, Aristotle, Plato, Diana, Mercury, and the other ancients to whom contemporary writers were always referring their readers. Over the entrance is a curious Latin inscription, which I have never yet seen copied correctly; this is the more remarkable since any mistake destroys its individuality, for it is in reality written in two hexameter lines,—

“En has Francisci Willoughby militis ades,
Rara arte extructas Willoughbionis ades;”

to which is added the date of beginning and ending,—

“Incœtate 1580, et finita 1588.”

Of Burleigh it is needless now to speak as also of Kirby, rushing to a melancholy decay,—a decay as complete as that which has overtaken Slougham-place. But one client of Thorpe's in whom all the world takes interest, and for whom he designed a tiny house, to be built in St. James's, was Sir Walter Rawley. There is also a house labelled “heather [hither] end of Holborn,” which would locate Thorpe's offices in or near London, possibly in the City. In his plan of Henry VII.'s Chapel we probably see the source whence he adopted some of his peculiar bay windows, and very possibly the fan tracery of that structure supplied the idea for some of the plaster ceilings of the Renaissance.

Among the names occurring as owners of some of the houses are the following, whom I have hitherto been unable to identify, but perhaps this paper may be the means of eliciting information:—Sir Wm. Ruffden, Mr. Johnson the druggist, Sir Thos. Dorrell of Lincolnshire, Sir John Bagnall, Sir George St. Poole, Mr. Keyes, Mr. Denham, Sir Wm. Huseridge, Mr. Panton, Sir Hen. Neville, Mr. Taylor of Potter's Bar, Mr. Wm. Powell, and Mr. Ate.

It is time, however, to draw to an end, though not because the subject is exhausted, for I fear I have done little more than touch its skirts. John Thorpe's book is a large meal to digest; how much more, therefore, the English Renaissance? For my part, I do not care to extol the merits of one style more than another, nor do I see why, because we prefer one particular period, we need therefore go about to deny any excellence to every other. The Renaissance undoubtedly has suffered unmerited obloquy from the early school of Gothic revivalists, but if we reflect a little we cannot fail to see that as the outcome of an intensely

interesting age, it demands both attention and respect.

Listening across the centuries to the clamour of the Dark Ages, what do we hear? The din of strife and the ring of hard blows on iron armour. Sometimes above the roar swells the solemn voice of the priest, and once or twice through the hulls we catch the bitter cry of the down-trodden serf. Amid the dust of battle and the flashing of fierce weapons no softening influence, no art is visible save architecture; and we stand almost bewildered that people so rough and uncultured could have left behind them such faultless art—the one link which binds our sympathies with theirs. But with the Renaissance all was changed. Art triumphed over brute force. The clouds of war began to lift, and with song and laugh mankind emerged from the darkness and took the first step on the path which has never ceased to lead onward to the freedom and comfort which we now possess. We may not neglect an epoch such as that. We cannot live unmoved by the joy which lighted the world when Spenser sang and Shakspeare played, when Burleigh counselled and Drake fought, when

"My grave Lord Keeper led the brawls,"

and when John Thorpe went from place to place, and amid broad pastures and rustling trees, built into his stately walls not a little of the brightness, the splendour, and the airy fancies of that brilliant age.

The Chairman, in opening the discussion, said that the applause which had followed the reading of the paper was the best index of the appreciation with which it had been listened to. The Renaissance period had a great interest for the student. It was the beginning of a new era. Professor Kerr, in his paper at the Architectural Conference the other evening, while giving a high expression of opinion as to the value of draughtsmanship, at the same time threw out the warning voice that it was not everything. And here they saw that in John Thorpe, with his quaintly-expressed drawings, they had a practical architect, able to raise those stately edifices, even though his draughtsmanship would now be open to criticism. It would often be a good thing if architects of the present day adopted Thorpe's principle of having a place labelled "waste" on their plans. Addressing students, he would advise them to take whatever was good in the spirit and principle running through Thorpe's book; but in matters of detail they should go to the purer streams from which the Renaissance came.

Mr. Wyatt Papworth, F.S.A., said that twenty years ago John Thorpe's book had been of great interest to him, and he had hoped then to have leisure to do what Mr. Gotch had now done. He had always had his eyes upon Thorpe; but, except in two instances mentioned by Mr. Gotch, he had failed to find any reference to him. He was one of those who thought that Thorpe was an amateur, and not an architect, from the character of the drawings; but, he thought, Mr. Gotch had clearly shown that Thorpe was a practising architect. There were many men of the same period of whom little or nothing was known. Indeed, county histories did not seem to think it necessary to name the designers of the buildings. Stow mentioned that the house of Lord Derby in Cannon-row was in course of erection at the time he wrote, but did not give the architect's name. As to John Shute he died the year after his work was published, and except that he called himself painter and architect, nothing was known of him, though there was a Latin inscription on his tomb stating that he had designed a large number of buildings.

Mr. R. Phene Spiers remarked that although he knew most of the buildings which had been referred to, he did not know who was the designer. There was one point on which he would like to have some information. How was it that Robert Smithson was said to be the architect of Wollaton Hall? Then, again, who designed Longleat? It was said that the plans were put into the hands of John Thorpe. Smithson was engaged both at Longleat and Wollaton, and the question was whether he was the clerk of the works or the architect. He hoped Mr. Gotch would find out something more about Smithson, and also about the architect of Nottingham Castle, whether it was Smithson or a man named Marsh who constructed at Bolsover Castle a block of buildings which were never finished, but which were the most refined block of Italian buildings to be found in England.

If Mr. Gotch would take up this neglected period of architectural history, he would confer a great benefit upon those who listened to him at the Association, and also add to the pages of architectural history. Mr. Spiers concluded by proposing a vote of thanks to Mr. Gotch for his excellent paper.

Mr. J. D. Sedding referred to the identity of the Renaissance in the sixteenth century with that of the Renaissance going on in England at the present time. It had been said that light and happiness came in with the Renaissance, but it was the death of craftsmanship. He happened to be a student of the Gothic, and one thought of the beautiful Mediaeval buildings, where the workman used his fancy unfettered in the most extraordinary degree. Little fancy was to be found in the sculpture of the Renaissance periods. He was glad to find that Mr. Gotch referred to the origin of the bow-window in Henry VII.'s Chapel. The speaker seconded the vote of thanks.

Mr. S. W. Kershaw, M.A., F.S.A., remarked that there was a doorway at Lambeth Palace said to be a counterpart of a doorway at Longleat. It was the near doorway to the end of Juxon's Hall, and he would be pleased to show it to any of the members. They did not know whence it came for a long time, and this showed how entangled was the history of these buildings, as they got so little light from the archives. It struck him that the ornament of the Renaissance was to some extent of English growth, and one might trace its connexion with the coming over of noted men from Switzerland and Italy.

After a few remarks from Messrs. Clarkson and Stokes, the vote of thanks was put and carried.

Mr. Gotch, in replying, said that he was much indebted to Mr. Papworth for some points in his paper. He was obliged to Mr. Tucker, who had traced the drawings from John Thorpe's book. Mr. Spiers wanted to know about Smithson's connexion with Wollaton Hall. His epitaph stated he was architect and surveyor of Wollaton, and he might have succeeded Thorpe, who again might have quarrelled with his client in carrying out the work. He could not say where Thorpe ended and Smithson began. He had heard that Thorpe was engaged at Longleat, and he therefore applied to the Rev. Canon Jackson, who was an authority, asking whether it was true that Thorpe had anything to do with it, and whether there was a picture there of Thorpe dying on the terrace. Canon Jackson replied that there was no scrap of evidence that Thorpe had anything to do with Longleat, and that the story of his dying on the terrace was also told of John of Padua. He agreed that the plans were characteristically English. It had been said that Montacute was attributed to John Thorpe, but he had not found a plan of it in the book. In Gothic, England was one of the leaders, and in it they had a native art, but in the Renaissance there was a distinct change, because the ideas came from abroad. At the same time they worked out the ideas in their own way, because the Renaissance in Thorpe's time was essentially English in its feeling, some of the carving being extremely vivid and nervous.

ROYAL ACADEMY SCULPTURE.

III.—STUDY OF A LION BY MR. G. SIMONDS.

THE life-size study of a lion, which forms a conspicuous object in "the lecture-room" at Burlington House, is in fact only a model for a colossal lion which is to be erected at Reading, as a monument to the officers and men of the 66th (Berks) Regiment, who fell at Mairwand and elsewhere during the South African campaign. The colossal figure will be 13 ft. 4 in. high to the highest point of the mane, and will stand on a terra-cotta pedestal, upon which the names of those commemorated will be inscribed on each side. At one end of the pedestal will be a dedicatory inscription, at the other end extracts from despatches from the field of battle. The monument is the joint offering of the various Berkshire regiments (both regulars and volunteers) and of the town of Reading and the county of Berks.

It was partly *apropos* of this work that Mr. Simonds read his paper on "Mechanical Aid to Sculpture" at the Civil and Mechanical Engineers' Society, which we printed, and which led to some correspondence on the subject in our columns. A glance at the work as in progress at the sculptor's studio,

in huge separate blocks, of each of which only a portion can be taken in by the eye while working on it, would at once render evident the necessity of accurate mechanical transference from the smaller model, to ensure the correct proportion of the details when carried out on the colossal scale.

Our illustration is reproduced (slightly enlarged) from a drawing kindly made by Mr. Simonds for our pages.

CORPUS CHRISTI COLLEGE, OXFORD.

THE new building about to be erected from Mr. T. G. Jackson's design, at the corner of Merton-street and Grove-street, will provide nine sets of rooms for undergraduates, with the necessary offices.

Like many of the older colleges situated within the line of the ancient City walls, Corpus so completely occupies its site as to admit of no extension of the actual college buildings.

The new building is to stand, therefore, on ground belonging to the college on the other side of Merton-street, and is so planned as to allow of extension backwards and the formation of a complete quadrangle hereafter, if the necessities of the college should render further enlargement desirable.

The contractor is Mr. Estcourt, of Gloucester, and the clerk of works is Mr. Long, who is also superintending Mr. Jackson's new buildings at Trinity College.

SHERBORNE ABBEY TOWER.

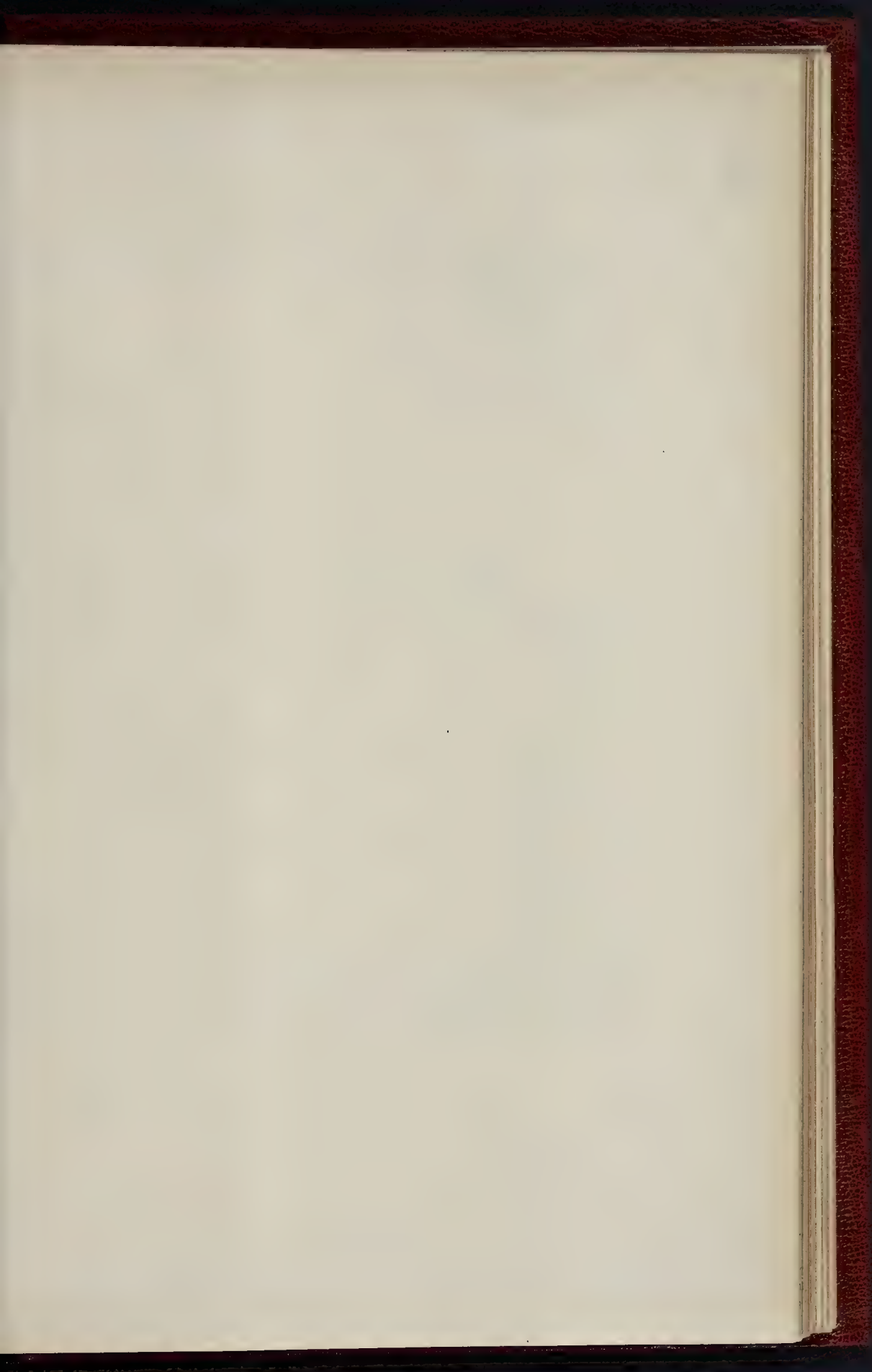
SINCE our description of the proposed works of restoration (p. 557), the east wall has been taken down to the line indicated on the elevation. The line is a few inches above the iron ties and bands, added some half-century ago by the direction of Mr. Percy. It is now evident that this ironwork, and the great trusses also added by that gentleman, have saved the tower from ruin. The Norman portion of the wall had no mortar, only dust and small broken stones, such as is used for road ballast, with an external and internal skin of stone ashlar, which no bonding, just like the piers below, which were rebuilt under the late Mr. R. C. Carpenter in a similar manner, and for the same reason as those of Peterborough are being reconstructed under Mr. Pearson. The perpendicular portion of the wall was also very poorly built, and with bad mortar and little bond. Far down in the interstices of this wall was found molten lead, the result of the great fire in Abbot Bradford's time; also the burned ends of beams and putlogs.

The open Norman Gallery will be noticed on the drawing, and the remains of it on the east side; it was found that when the great relieving arch was turned by Abbot Bradford (in order to remove the Norman arch, and continue on the choir vault), the builders were content merely to cut the arch through the gallery walls, and to build no abutment for it in the open passage, which was found to run up to the arch, leaving its back exposed, the space being merely filled in for a foot or two with loose rubbish. It is no wonder, therefore, that the arch gave way as soon as the tower was built on it, thus producing fractures in the then new work alluded to (p. 557). The open fissures in the now exposed extrados of the arch have been filled with liquid cement, an enormous quantity being required. This arch will for the future be relieved of weight by the new one over it, the springers of which are strongly constructed and tied in, and rest on a solid mass of brick in cement, built between the two ashlar walls of the Norman gallery.

The Portland stone landing on which the north-east springer rests forms the "corner-stone," which was laid by the Hon. Mrs. Kenelm Digby, whose great-uncle the late Mr. G. D. W. Digby, so nobly restored the choir, and who, up to the day of his death, was anxious to start this most necessary work of the tower restoration.

All the old stones which will be repaired on their old places are carefully numbered and laid out on the adjoining platforms; a portion of the ancient crocketed pinnacle has been found in a putlog hole. There are no masons' marks on the Norman stones; the later date of masonry is marked thus ∇ on the bottom beds pointing inwards.

The Percy trusses now carry the whole weight of the bells and frame, proving the idea of their design and the wisdom of the idea given for them by Professor Wilkins in 1829.





C. F. Kell Photo Lith & Printer

NEW BUILDINGS, CORP

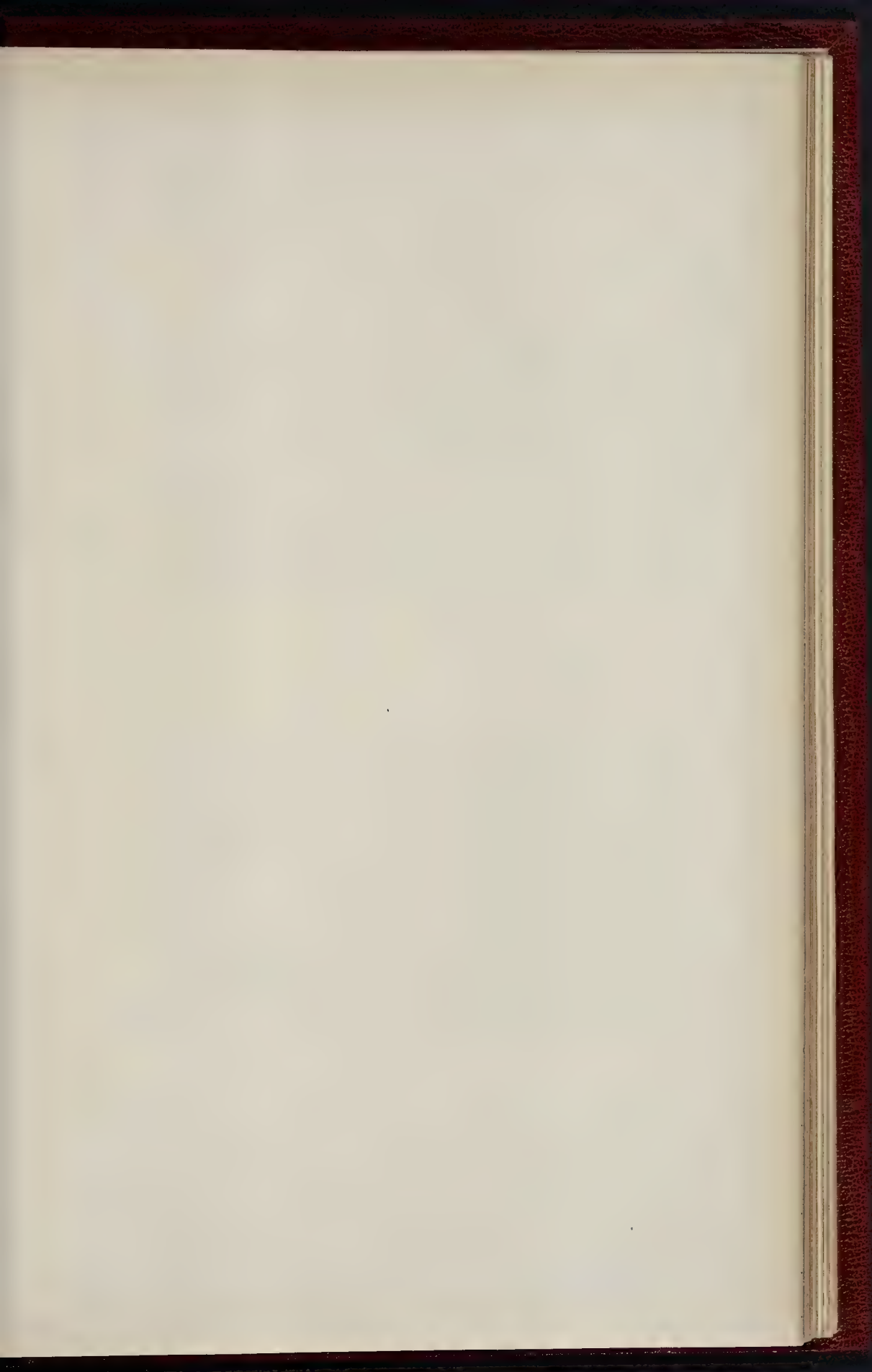
MR. T. G. JA

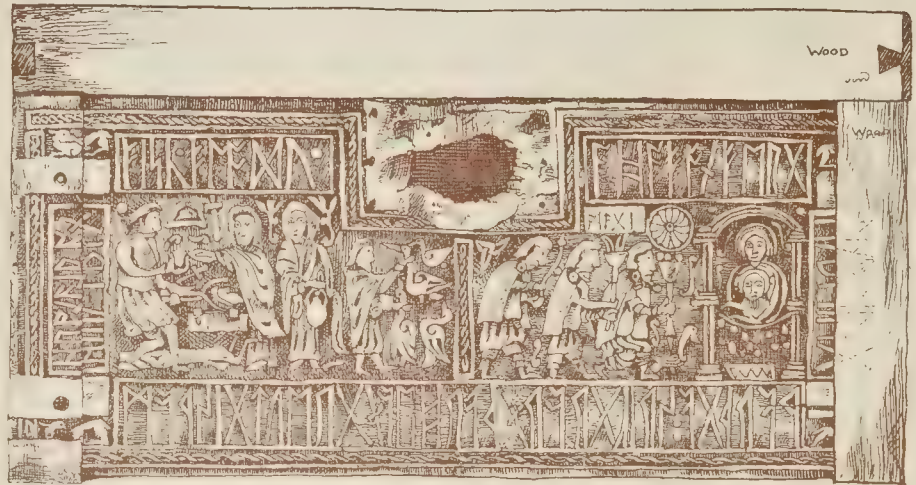


8 Castle St. Holborn, London. E.C.

ISTI COLLEGE, OXFORD.

A., ARCHITECT.





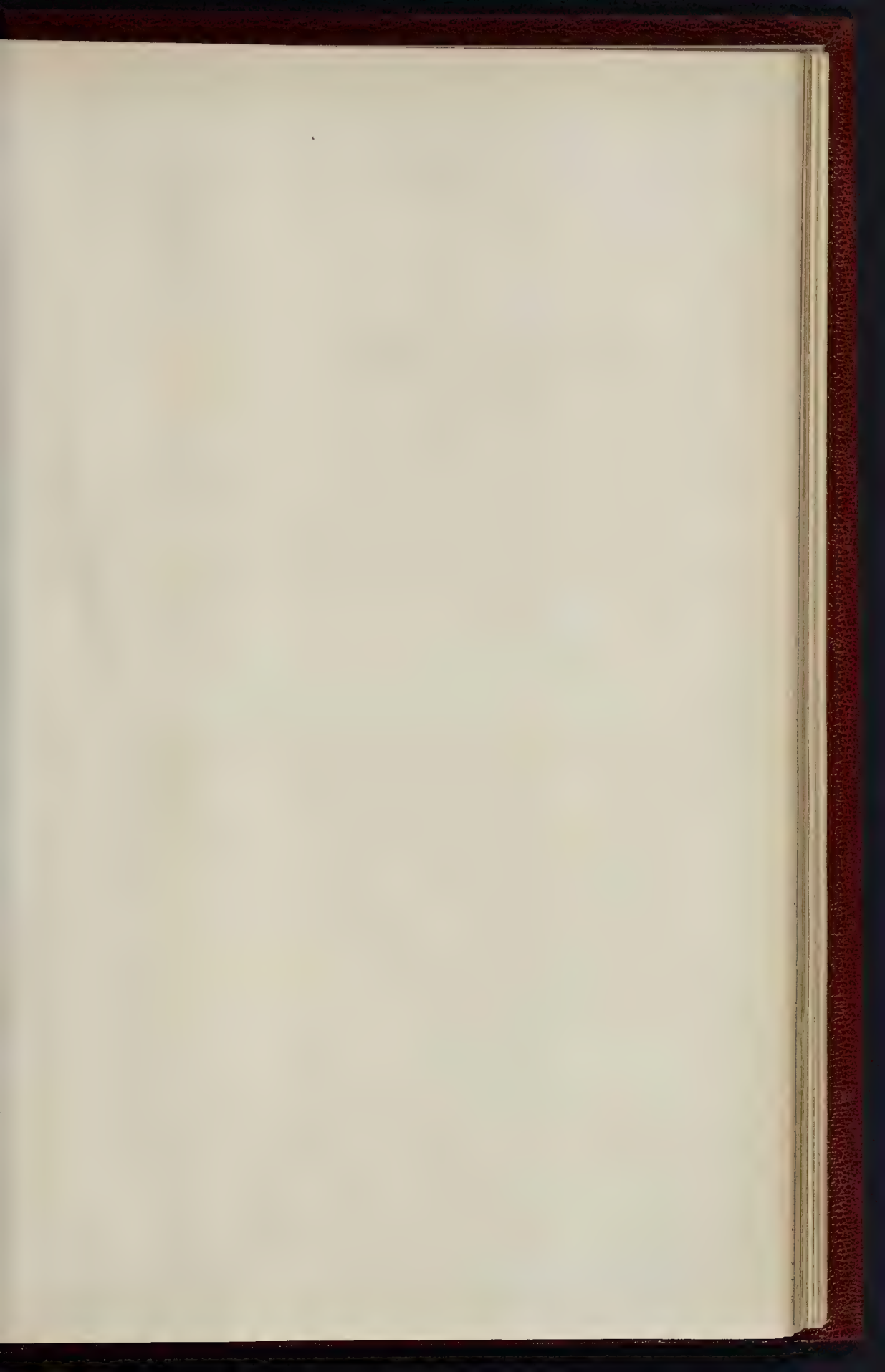
THE DECAPITATION OF ST JOHN BAPTIST

THE ADORATION OF THE MAGI



THE LEGEND OF POMULUS AND HIS BROTHERS

THE ANGLO-SAXON CASKET IN THE BRITISH MUSEUM
(see Professor Hodgkin's Lecture)





SCULPTURE

No. 3. STUDY

From an

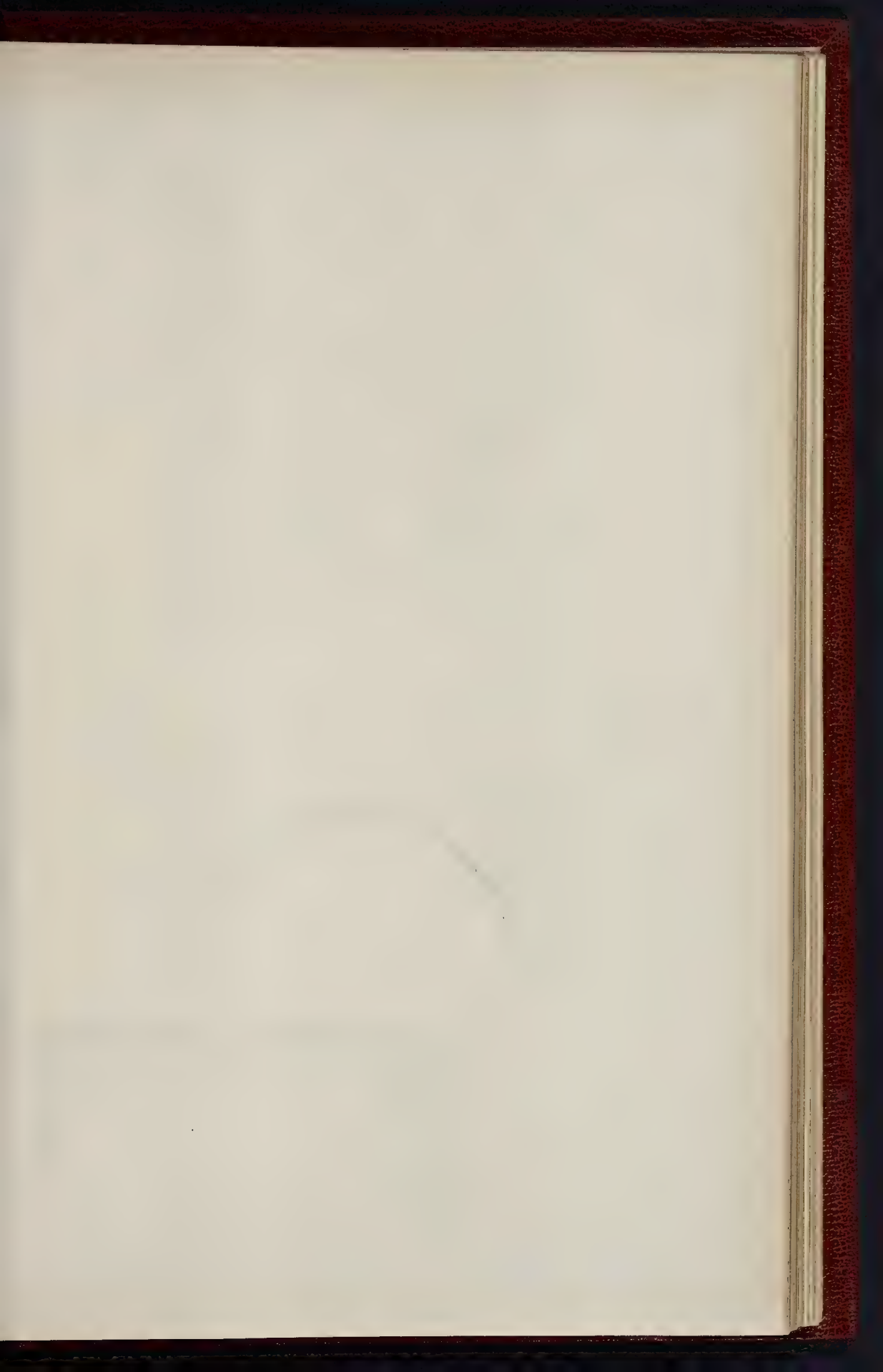


1884

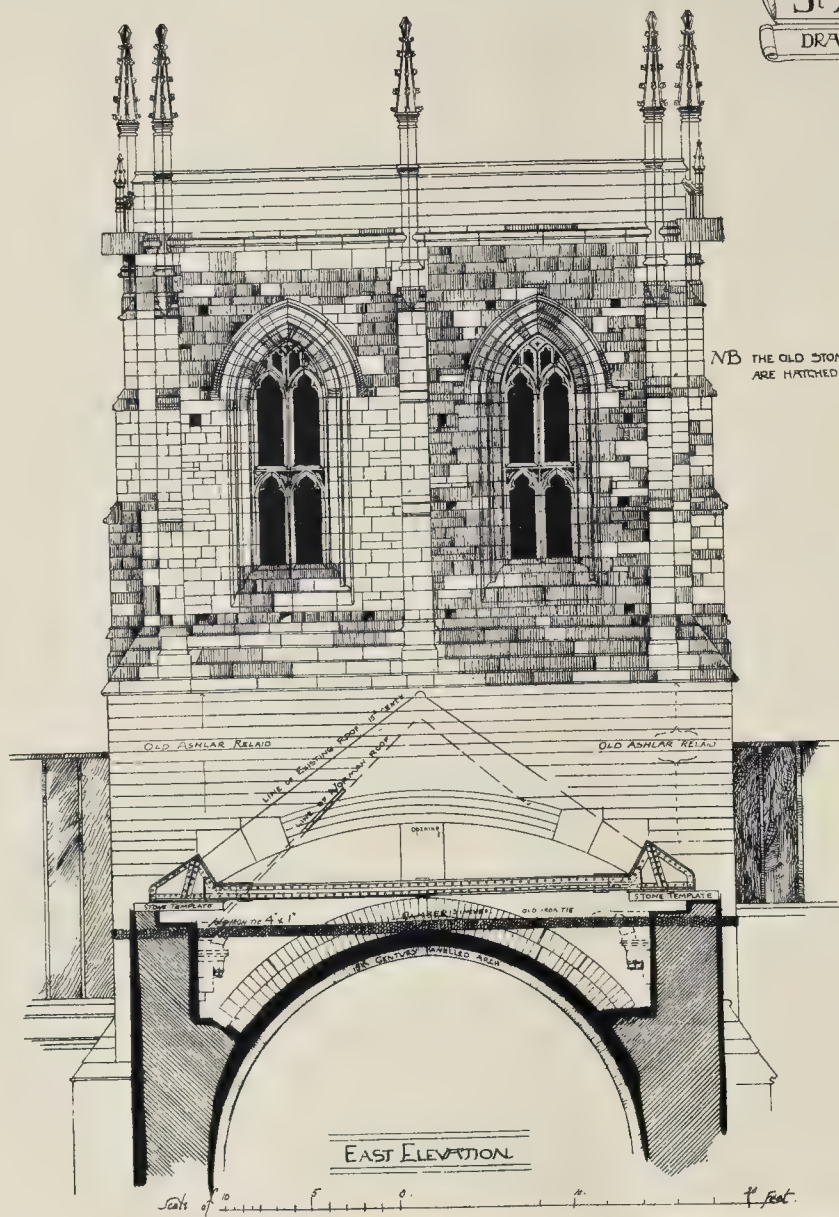
ROYAL ACADEMY.

BY MR. G. SIMONDS,

etch by the Artist.



St Mary's
DRAWING SHEET

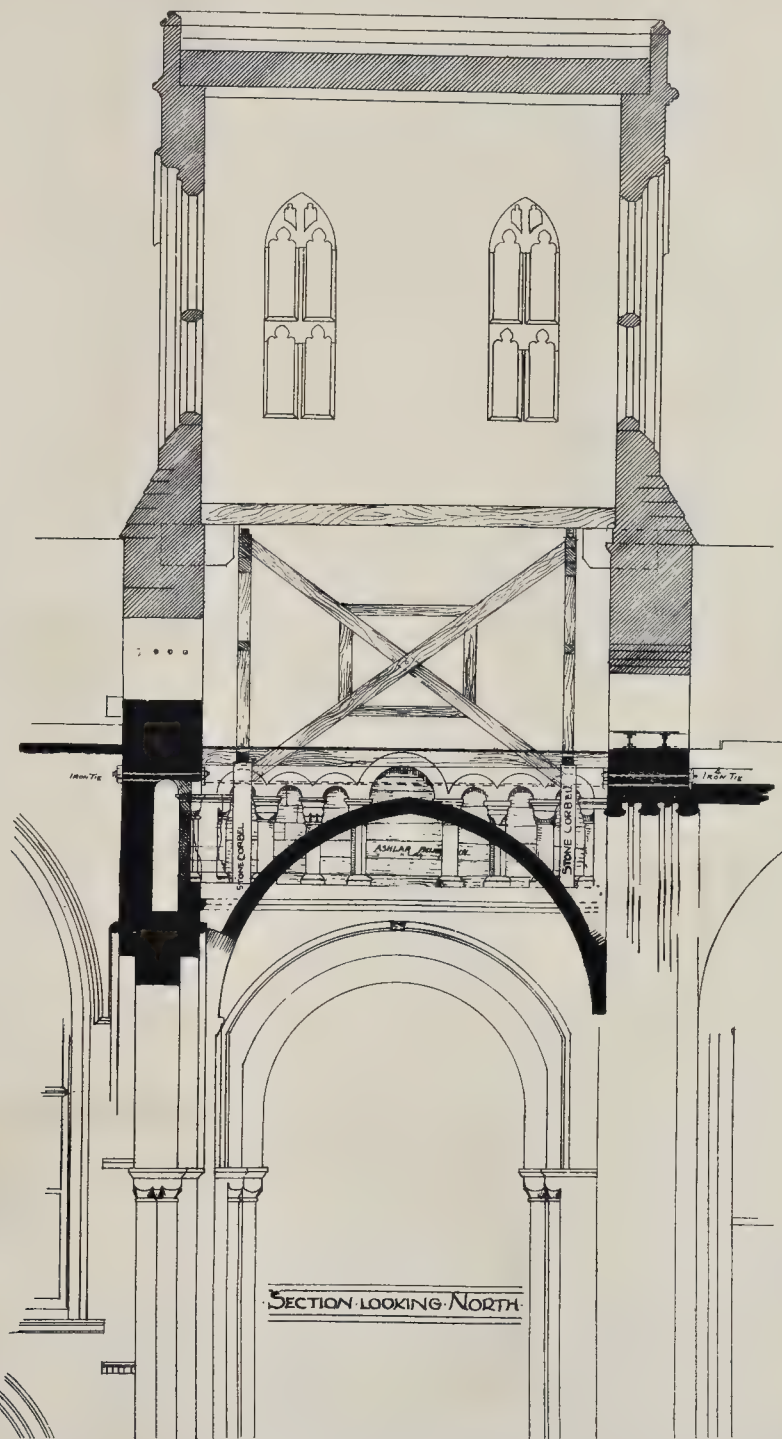


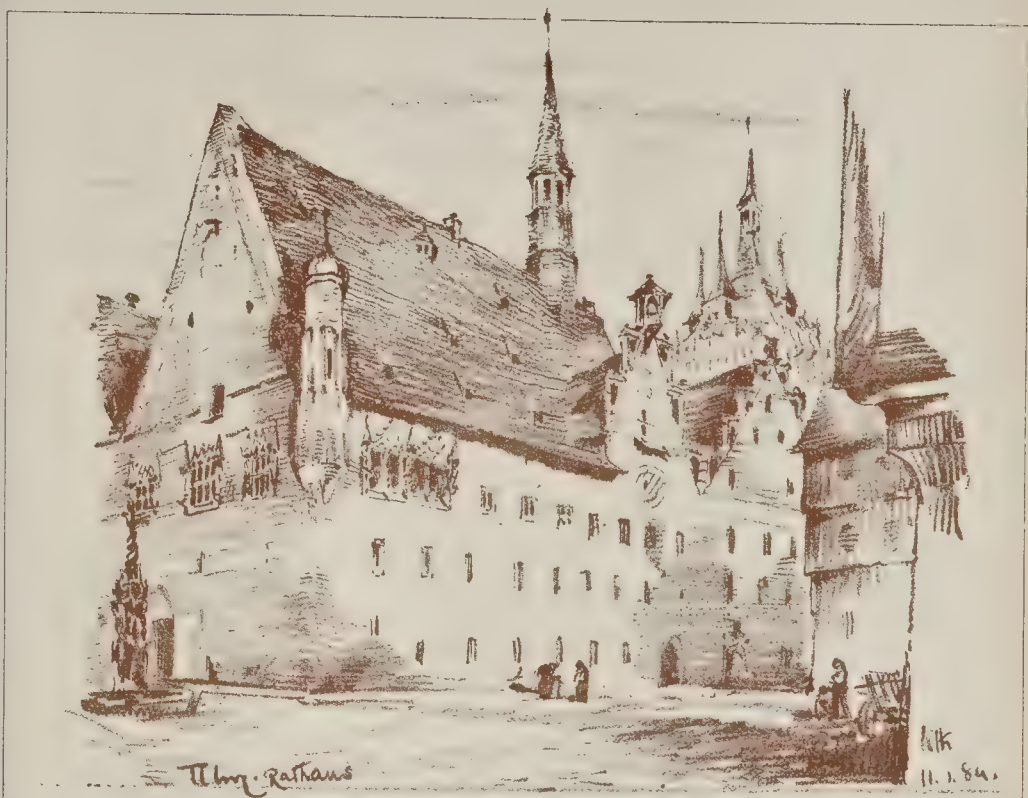
NB THE OLD STONES ARE HATCHED.



SHERBORNE
BUILDING OF EAST WALL OF TOWER

M^r RH CARPENTER AND M^r BEINGELOW
ARCHITECTS





MR. HODGETTS'S LECTURES, BRITISH MUSEUM.

THE lecture given last week on "The Casket" in the Anglo-Saxon Room at the British Museum carved bone casket presented to the British Museum by Mr. Franks. Some portions of the lecture, as in the case of previous lectures in the course, were only very indirectly connected with the artistic or archaeological side of the subject; and in place of reporting it very fully, we have preferred to give a page to illustrating part of the casket referred to. The remainder will be illustrated in our next.

The sides which are given this week (see lithograph) represent the Decapitation of St. John the Baptist, the Adoration of the Magi, and the legend of Romulus and Remus. The mingling of associations is not more odd or more forced than it is frequently in Italian Renaissance ornament; but it is certainly difficult to understand what supposed relation between them led to the subjects being sculptured on the same casket. The top and the remaining side represent a warrior in a house attacked by others, all in Anglo-Saxon costume; and the attack on Jerusalem by Titus.

In regard to the portions illustrated this week we abbreviate Mr. Hodgetts's remarks. He said:—

"The casket in question stands upon a support at the left-hand side of the door of communication between the Anglo-Saxon room and the Roman-British room. It is very properly placed under a glass case, being entitled to special honour and special care.

At the first glance, the casket is seen to be of horn or bone, and is, in fact, what may be termed marine ivory, being formed of the tusk of the walrus.

The three sides exposed to the view of the public are carved with very spirited figures. On the upper portion of each side there is a Runic inscription of the class which I have before designated as being of the Northumbrian type. The subjects represented by the carvings are very varied in character, being of classical, Scriptural, and Scandinavian origin; and from these curious specimens of Early English art many lessons are to be learned of the time when it was made. The front face represents the mythological story of Romulus and Remus, and their miraculous preservation by the wolf, to the better comprehension of which we are largely indebted to the Runic inscription, which runs as follows:—*OTHLECN NEG ROMWALUS AND REMWALUS TWEGNI GIBROTHUR F EDDIE HLE WYLF IN ROMESCETRE*. This may be rendered:—'Rom-wal-us and Reum-wal-us (two) twin brothers lay out (were exposed) near together, fed them a wolf in Rome's town.' Of course the names of the founders of our ancient enemy, Rome, were, according to the myth, Romulus and Remus. Whence, then, the extraordinary forms under which they appear—Rom-wal-us and Reum-wal-us? I fear we have to charge our forefathers with the vice of punning.

The word *walrus* is a corruption of the expression *walross*. The first syllable of the word lives on in our *whale*. The *h* in *whale* was formerly written as an initial before the *w*, as *hwal*. And in the two words before us the inveterate punster has, in view of the substance in which he was working *hwal bân*, or the tusk of a whale horse, introduced the word *whale* in the classic names of Romulus and Remus, making the vile puns thus consecrated by time,—*Rom-hwal-us* and *Rem-hwal-us*,—proving that the spirit of *Punch* is of much more respectable antiquity than has hitherto been supposed."

This interpretation would seem almost incredible, but that on another side of the casket is to be found evidence that there really was an intention to connect the work with the idea of the animal which furnished the material to work in:—

"In the next tableau we find the connexion readily enough by means of the inscription, but the actual nature of the connexion is obscure. We are introduced to Scriptural subjects,—the presentation of the head of John the Baptist to Herodias and her daughter, and the Adoration of the Magi. At the first aspect, nothing in common between the whale and these subjects is discernible, but here the Runes step in with a little light. We read them thus:—*HOXNAS RAN FISC FLODUR, ABOF ON FERGEN BERIC, WARTH GASRIC GRORN TELER HE ON GREUT GISWON.* To

make sense of these words we have to substitute in the words *gasric*, *grorn*, and *fergen* the letter *h* for the letter *g*, giving us *hasric*, *hroren*, and *ferhan*. The allusion to the walrus comes out in the following manner:—'The whale's bone from the fish-flood I raised to the living hill. His den reign was cast down when he swam on the sands.' In these words are traces, if I read aright, of an abstract thought. The walrus was thrown ashore on the Northumbrian coast, therefore the language of the inscriptions is the Northumbrian dialect. The head was severed from the body, and the tusk was exalted or raised to a 'living height' or the 'soul's hill' by being made the vehicle of Scriptural instruction. There is another curious element to consider, which is that the whale was decapitated for the sake of his *bân* or tusks which project from his head. This would be quite enough to justify the Early English religious man in making a parallel between the beheading of St. John and the decapitation of the walrus.

In the group where the presentation of the head of St. John the Baptist is shown, we see the wimple of the Anglo-Saxon ladies beautifully rendered. The man who is bringing the head wears almost a Highland dress. This is similar to those shown in the Cadmon MS.; and on showing the pictures in that MS. to the Colonel of a Highland regiment, he at once identified the 'kilt.' Doubtless the kilt was an adaptation of the Rock or Pad of the English, and was, with the broadsword, adopted by the Gael. The cap worn by this person is extremely like the Highland bonnet, for which it unquestionably supplied the hint. He bears a curious instrument, supposed to be a pair of forceps, by which he holds the head. The chief female figure holds a drinking-vessel, and the second has a bottle of wine in her pouch from which it has been filled. It is now offered to the man as a reward for his pains. The women both wear the gunns, or long gown, in which their forms are scrupulously draped as in all representations of Saxon women.

The adoration of the *Magi* is clearly pointed out by the word *Mægi*, carved over the group."

In this part of the work will be observed the rude architectural representation of a shrine with a segmental arch, and with the shafts, banded in a manner curiously resembling the banding used on shafts in early thirteenth-century architecture. (We cannot use the term "Early English," because Mr. Hodgetts would reply that this same bone casket is Early English.)

Some remarks about the remaining groups on the casket we will give next week, when we give the illustration of the remainder.

TWO GERMAN RATHHAUSES.

THE Rathhaus of Ulm is a simple building, covered by a great gable roof with a bell-turret gay with coloured glazed tiles. Two piquant gables and a corbelled turret, which, with the group of ornamented windows, emphasise the important room of the building, are its sole architectural features. The strict economy practised here has not interfered with a picturesque and happy result. The stone fountain, which Prout has enormously exaggerated in his Ulm picture, is seen to the left, and the cathedral tower with its crown of spirelets, to the right.

The view of Münster Rathhaus shows the back gable, which is as devoid of ornament as the well-known one in front is to the contrary. This Great Pyramid among gables has lost nothing by being let alone, its great size has enough intensity to enable it to dispense with the more ordinary means by which buildings are made attractive.

Houses, Kensington-Court.—Referring to the notice which we gave last week (p. 761), of some new houses at Kensington Court, we are asked to say that No. 2, Kensington Court is being painted throughout with Browning's Patent Paint (of which the Indestructible Paint Company are the manufacturers), by order of the architect, Mr. T. Graham Jackson.

New Lunatic Asylum, Exeter.—Messrs. Rowson, Drew, & Co. have secured the contract for the girder work for the City of Exeter Lunatic Asylum, now being built by Mr. Henry Phillips, of that city, from the plans of Mr. R. Stark Wilkinson, architect.

LOAN EXHIBITION OF PORTRAITS AT CAMBRIDGE.

THE Cambridge Antiquarian Society is by no means a lifeless institution. It has during the last three years given abundant signs of vigour, and its latest undertaking is only another proof of usefulness. That Cambridge is rich in portraits of many periods has long been known, but no exact information has been attainable as to the number, whereabouts, and value of the pictures. It was, therefore, desirable from every point of view that a good and authoritative catalogue of Cambridge portraits should be prepared, stating their names, dates, origin, and other particulars connected with them. Such a catalogue could, however, only be formed after bringing together all the pictures belonging to different colleges, and comparing them together; for so many of them are merely repetitions one of another, and many again are copies of well-known originals existing in other parts of the country, that the co-operation of many students is required to produce a result of lasting value and authority. This year, therefore, a beginning has been made. The authorities of the Fitzwilliam Museum have placed a room at the disposal of the Antiquarian Society, and it has borrowed from the different colleges all portraits of people who died, or whose pictures were painted before the year 1603. Mr. J. W. Clarke, the President of the Society, has organised the exhibition.

Of the pictures exhibited, many, of course, are by no means remarkable as works of art; happily, however, even a bad portrait is not without interest. The best picture shown is undoubtedly the famous likeness of Fisher Bishop of Rochester, painted by Holbein, and belonging to St. John's College. It was included in the first of the Loan collections at South Kensington, and is thus already known to many. Woltmann, if our memory is correct, did not accept the work as genuine, but his hesitation is not generally shared, for the picture has all the signs of a great artist's conception of a great man. The Bishop is represented in his old age, looking full at the spectator. A whole tragedy is written in his face; his grave eyes look forward long and steadily, yet with an expression of pain. His hands seem to have something of a nervous twitch about them. There is a precision in the artist's rendering of all these and a hundred other minute characteristics that stamps the work, notwithstanding much and evil restoration, as of the very highest order. A comparison of the picture with the copy of it, belonging to Queen's College, good in its way though that also is, should be sufficient to make plain to the meanest capacity what is the difference between a great portrait, painted by an artist under the immediate influence of his subject, and a copy, however honestly made, by a painter of ordinary intelligence. There are also two other portraits of Fisher, of a different and very inferior type.

Of fifteenth-century paintings there are, of course, very few. A picture purporting to be a likeness of Edward III., is only a copy of some manuscript illumination. Two pictures of Henry VI., one of Edward IV., and one of Henry VII., merit little attention. Leaving them out of the question, the earliest noteworthy portrait is one painted on a gold background, and belonging to the University Library. It has always been called a portrait of Erasmus. The keen, pointed nose and thin lips do, indeed, somewhat resemble him, but the face would not naturally suggest the name of the great Humanist. The man, whoever he may be, appears to be about forty years of age; he wears long thick hair, covering his ears, and confined within a black cap. His right hand is visible, resting, as it were, on the inner edge of the picture-frame, and holding a pink, the usual symbol of friendship. Who the artist may have been it is not possible to guess, but the style of the workmanship suggests that he was a second-rate painter, educated in the fifteenth-century Flemish school, and painting in the old-fashioned style. The picture is clearly a bad likeness of whomsoever it is intended to represent. The name of Erasmus may as well be attached to it as any other.

Of genuine, though in every case second-hand, portraits of Erasmus there is no lack. Queen's College, where he resided for a time, is, of course, the best supplied with them. A panel-picture from the Lodge there is one of the

numerous portraits of Erasmus assigned by tradition to Holbein, though in reality nothing but a copy. It is of the same type as a panel recently presented to Trinity College. There is at Queen's, however, a really fine little portrait of Erasmus, sadly dusty and faded, apparently painted in lime colours on linen, in the manner of which Dürer was so fond. It is the only one of the Cambridge pictures which bears that bright, keen aspect so conspicuous, for instance, in the portrait by Holbein at the Louvre. A large half-figure, belonging to Corpus Christi College, painted in panel as a companion to a similar portrait of Dean Collet, of St. Paul's, is likewise worthy of mention; though, of course, it also is only a repetition of a well-known type.

There are no less than ten pictures of the Lady Margaret, mother of Henry VII. and foundress of St. John's and Christ's Colleges. She spent a portion of her later days at Cambridge, residing, under vows of widowhood, in rooms which she reserved to herself at Christ's. At her death she left a large sum of money in the hands of her executors to be expended in charitable bequests for the benefit of her soul. As one of many memorials of her they commissioned the painter, Harry Mayner, who was one of the witnesses to Holbein's will, to paint her picture for the Chapel of Christ's College. It would seem that the usual position for the founder's or foundress's portrait was the west wall of the College Chapel. There, at any rate, the portrait in question still usually hangs. It represents the wizened old lady, in the garments of a nun, standing with her book of hours open in her hands. A similar position in the Chapel of St. John's College was, no doubt, once occupied by the portrait of Lady Margaret kneeling in prayer. It is printed upon a large panel by some second-rate artist of the Flemish school. The face is well and expressively rendered, but the golden damask hangings and, indeed, the draperies in general, are very poorly treated. The rest of the picture has been so much restored that it is impossible to tell what it was originally like,—the hideous wooden hands, the worst part of the whole, are the work of a modern workman of miserable incompetence.

The most conspicuous Royal portraits are the two pompous full-lengths of Henry VIII. and Queen Elizabeth. Henry is something over life-size, and a most ponderous personality. He is represented in the usual fashion, with his legs well apart, and one hand resting on a dagger. His garments are of the richest kind, well calculated to set off to advantage his portly person. The painter of the picture was Lucas de Heere. He copied it from Holbein's famous wall-painting, burned at Whitehall, about the end of the seventeenth century. A half-length of the same king is of a different type, but it is a poor picture, of no moment. The portrait of Elizabeth is a great contrast to that of her father. It has none of the gravity of a work of the Holbein school, but substitutes for that the elaborateness in the treatment of costume characteristic of such an artist as Zuccaro. Portraits of Elizabethan women are, indeed, little more than pictures of most extravagant and unnaturally-formed costumes fastened upon a body, which they distort. The human being is always subordinated in them to the costume. Such a picture is the portrait of Mary, Countess of Shrewsbury, lent by St. John's College, in which the painter has almost confined his attention to the costume. The contrast between such pictures as these, the best work of the period, with those by second-rate artists of the reign of Henry VIII., is remarkable indeed.

Anne Boleyn and Jane Seymour are the only two of Henry's wives whose pictures find a place in the Exhibition. The Jane Seymour is a modern copy of a known work. The Anne Boleyn belongs to the Master of Trinity, but he has made his intention known of leaving it to the college. It is a very pleasing picture, by one of Holbein's followers,—a three-quarter length, standing. The costume, with its bright reds and golds, is pleasing, without being exaggerated in any respect, and the whole is treated with much artistic power. The queen's name, which must be read from right to left, is embroidered upon the hem of her dainty white head-dress. The picture is understood to have been purchased in Italy.

The private property of the Provost of King's, though likewise destined one day to be presented to his college, is a notable portrait of Cardinal

Wolsey. The most famous portrait of the Cardinal belongs to Christ Church College, Oxford. It represents him standing in profile to the left, within a room, whilst through a window behind is a view of the college itself. The Provost's picture is stated to be a replica of this, with a difference in the landscape. It is a fine and credible image of a visibly powerful man. He is advancing forwards, and raising his right hand in benediction as he goes; there is, however, little aspect of benediction in his face. Two more portraits of the same man are lent by Trinity and Corpus Christi Colleges; but they are only repetitions, on a smaller scale, and with plain backgrounds, of the same type. There remain a considerable number of pictures of the Holbein school well worthy of attention, but which we have not space to particularise.

Of the three portraits of Queen Mary, all very much of the same type, one of those from Trinity Lodge is by far the best. It bears much resemblance to the famous portrait of the Queen, painted by Antonio Moro, which hangs in the Gallery at Madrid and is traditionally reported to have been sent to Philip just before his marriage. The Trinity picture, though it represents the Queen in the same costume and posture, evidently reflects her features and fixed expression at a later period of her life. So hard and vicious is the look that one is inclined to imagine that the painter must have been a zealous Protestant.

The number of the portraits of Francis Sidney, Countess of Sussex, which came from Sidney-Sussex College, is accounted for by the fact that she was the foundress of it. The best of them is the notable full-length, which usually occupies a prominent position in the college hall. It is essentially an Elizabethan picture, the robes being the prominent feature. In this case they are finely designed and painted, and the woman is not quite annihilated by them.

The portrait of the Earl of Huntingdon (dated 1601) from Queen's College, is a full length of the same type. Far more interesting are two full lengths from Emmanuel College, representing the founder, Sir Walter Mildmay and his brother, Sir Anthony. Another founder, who must not be passed over without mention, is Dr. Caius. Caius College, unfortunately, has no very good portrait of him, if we except a small oil-painting, little larger than a miniature, which usually hangs in the College Library. It is beautifully painted, finely finished, and well preserved. It is certainly not a copy, but an original work, and the name of the painter ought to be discovered.

The pictures with which we have thus briefly dealt are by no means all that are interesting. They may be taken as specimens of the 150 or more of which the exhibition is composed. It is much to be hoped that before they are dispersed they will be thoroughly examined by competent scholars, and that the many unsettled questions connected with them may be decided once for all.

ELECTRICITY: ITS APPLICATION TO PUBLIC WORKS AND BUILDINGS.

THE CLERKS OF WORKS' ASSOCIATION.

At St. James's Hall, Regent-street, a lecture was delivered on the 15th inst. by Mr. A. Reckenzaun, C.E., on "Electricity: its Application to Public Works and Buildings, Motive Power, &c.," with experimental illustrations. The chair was taken by Mr. W. Birchall, President of the Association.

The Chairman, in opening the proceedings, said there was now going on a great competition in the building trade. Healthy competition was good, and did away with monopoly. Their subject that evening was one that tended to do away with a great deal of the monopoly of gas.

Mr. Reckenzaun then read his paper, in the course of which he said that though accidents had occurred through the use of electricity, on investigation they could be traced to the greatest negligence, and to ignorance on the part of those concerned. There was also a notion that there was danger of fire, and this had caused the insurance companies to demand extra premiums where the electric light was used. Electricians, however, declared that the use of the electric light would be attended with less danger than the use of gas. Electricity must of course be kept under control, and it was important that electric lighting

should not be entrusted to ignorant or unskilful hands. If wires through which a current was flowing became connected they would become hot, because if the current had no other outlet it would manifest itself in heat. Thus, if wires or cables were not properly insulated, there was always a danger of fire,—a danger, however, which could be guarded against. A really good electric-lighting engineer would undertake to put his wires through a barrel of gunpowder, and himself sit on the top of it. The accidents that had occurred were entirely due to want of experience. The great point in electric lighting was that the work should be of the most substantial character, that it should be done in a thorough workman-like manner, and thoroughly tested at the time for insulation. Gas must have been an expensive luxury when it was first introduced; and no doubt when we got accustomed to the better light afforded by electricity we should wonder why we had not adopted it sooner. The electric light was a nearer approximation to the solar light than any other, and it had been proved that it would ripen fruits and act upon the sensitive plate of the photographer. The use of the electric light was conducive to health and cleanliness. The intensity of artificial light was measured by candles. Thus a gas-burner of 14-candles should be equal to the light of 14-sperm candles, burning 120 grains of sperm per hour. The electric light was also measured by candles. Electricity could not be measured in the same way as gas or water, because it had no weight and no volume. The most important units of measurement for the electric current were Amperes, Volts, and Ohms. Resistance represented the degree of difference experienced by a current in flowing through a conductor. Good conductors, such as copper, silver, or iron, offered comparatively little resistance. German silver wire or tin had a little higher resistance; but bad conductors, such as wood, glass, india-rubber, and gutta-percha, offered a very high resistance. Materials of a high resistance were used for covering materials of less resistance. Mr. Reckenzaun then explained by illustration the effects of various materials when placed in contact. If, he said, a piece of insulated wire were wound round an iron bar, and an electric current was communicated to it, the iron became excited. With an electric engine it was an easy matter to obtain a rotary motion at once by changing the direction of the electric current. All the best modern dynamo-machines had rings or cylindrical iron cones. There was hardly any difference between a good Siemens machine and a good Gramme machine in point of efficiency. There were several kinds of continuous current machines, all of which were self-exciting. There were several kinds of self-exciting machines,—the Serre dynamo-machine, the compound dynamo-machine, and the Shunt dynamo-machine,—the details of the working of which the lecturer minutely explained. The Serre machine could be only used where there was no variation of the external work, but with the Shunt machine they might vary the work. That was to say, in a circuit of 100 lamps they might put fifty lamps out without affecting the others. The compound dynamo was regulated to such a nicety that if they had 100 incandescent lamps in a circuit, and they put out ninety-nine lamps, the remaining one would not break. The machine only produced such an amount of current as was required by the external circuit. In all arc lamps the positive carbon consumed twice as quickly as the negative carbon. He did not believe in alternating current machines, because they were not so efficient as others. They were also dangerous, and it was very difficult to measure what amount of current they were giving with any exactitude; but they were useful in this respect,—that in changing the current the carbon was supposed to last much longer. There were other things that told in favour of alternating current machines. To thoroughly describe the forms of all the dynamos in the market, and to point out the advantages and disadvantages of them, would require many lectures. Of all artificial sources of heat the electric arc was the greatest. The late Sir William Siemens had constructed a furnace in which steel or iron could be melted in a few minutes. The arc light was too powerful for domestic purposes, but it emitted a strong, slow, and safe light. The incandescent lamp required no mechanism. German-silver wire had about three times the resistance of copper. There were several kinds of incan-

descent lamps, but all were based upon the same principle. The carbon in the Swan lamp was made out of cotton-thread carbonised, and in the Maxim light carbonised paper was used. In order to supply a town with a few hundred thousand incandescent lights it would be necessary to have conductors of copper wire 8 in. or 10 in., or more, in diameter, which would be almost impossible. The essential points to be observed in any installation were sufficient motive power; secondly, one or more efficient dynamo-machines, capable of supplying a number of lights for any length of time without overheating; and thirdly the leads or cables must be of the best copper, covered with the best possible insulating material. The lecturer subsequently gave several illustrations of the power and usefulness of electricity, and so brought a very interesting paper to a close.

NEW STORM OUTFALL SEWER AT DEPTFORD.

FOR a period of about eighteen months a storm overflow sewer of exceptionally large dimensions has been in course of construction at Deptford, and as it is now almost completed it was inspected by several of the members of the Metropolitan Board of Works on Thursday in last week. Amongst those present were Mr. W. R. Selway, deputy-chairman of the Board, who represented Sir James Hogg, the chairman; also Mr. Richardson, the representative at the Board for Deptford, and about twenty other members. Mr. Grant, the assistant engineer, representing Sir Joseph Bazalgette, was likewise in attendance. As this sewer is the largest which has yet been constructed within the metropolitan area, some account of the circumstances under which the Board of Works resolved upon its execution, and the objects it is intended to serve, will be interesting. Shortly stated, it is for the purpose of carrying off without damage the excessive quantities of storm water which for many years past have done so much damage in this quarter of the metropolis, and it diverts the local storm waters from the upper part of Deptford Creek, into which they have hitherto been discharged, and conveys them from the present high-level sewer under Church-street, Deptford, and thence under Deptford Green to the foreshore of the Thames, and in continuation of a point nearly in the middle of the river, where they will discharge themselves.

The necessity for the construction of this sewer was explained to the company present by Mr. Grant, the Board's deputy engineer, who, before describing the sewer itself, made some very interesting statements in connexion with the southern main drainage system, with the view of showing that such a sewer had become an indispensable supplement to the main drainage system of the locality. He observed that one of the objects of the main drainage system was to divide the area of the land to be drained into two zones,—an upper and a lower zone. The lower zone was drained by a system of low-level sewers extending from Putney to Greenwich, at which point the drainage had to be pumped up a height of 18 ft. at the Deptford station into the upper end of the outfall sewers, which extended a further distance of eight miles to Crossness, where the whole of the sewage, including that from the upper zone, had to be pumped into the reservoir in which it was held until about the turn of the tide at high water, when it was discharged into the Thames and carried out seawards. The upper zone was drained by a series of high-level sewers, extending from Roehampton at the upper end of Putney, to Deptford, at which point the sewers from Tooting, Balham, Upper Norwood, Sydenham, and the lower part of the valley of the Ravensbourne, concentrated. The high level area was about thirty square miles, and the sewage brought to this point passed for 1,000 ft. through four lines of iron pipes, 3 ft. 6 in. in diameter, up to the head of the outfall sewer at the Deptford pumping-station, and, with the sewage pumped up from the lower zone, was carried down to Crossness. In continuation, Mr. Grant remarked that on occasions of heavy rainfall, when from 1 in. to 3 in. of rain fell in the course of a few hours, even the large outfall sewer, which was 11 ft. 6 in. in diameter, became overcharged, or would be if the excess were not discharged into the Thames, or, as hitherto, into Deptford Creek, which was a tributary of the Thames.

After describing the injurious effects which had for several years past been caused by this accumulation of storm water, and adverting to the complaints which had been made by the wharfingers at Deptford Creek,—who took objection to the storm waters from the sewers being discharged into the Creek, Mr. Grant said that the Engineer of the Board, Sir Joseph Bazalgette, was instructed to find, if possible, some other means of relieving the sewers of this storm water, and he recommended the construction of this new outfall sewer, which has been to a great extent completed. The difficulties to be met were how to get rid of such a large quantity of storm water, somewhat contaminated by sewage, without causing damages to barges lying in the Creek near the outlets, and also to avoid giving offence to those who had premises on the banks extending nearly three-quarters of a mile in length. Before proceeding along the sewer from its junction with the two high-level sewers, Mr. Grant explained in detail the object of the massive iron grops or Penstock flaps which separated the high-level sewer from that just constructed, showing the great ease with which they could be opened in case of emergency when storm water is required to be discharged. The new sewer consists in the first place of a special construction, at the point of junction, 90 ft. in length, and 24 ft. wide at the upper end or commencement of the sewer, being reduced to 13 ft. 6 in. in width at the point where the sewer is continued to its outfall. It is 11 ft. in height, and 3,050 ft. in length, to the flap-chambers near the margin of the river; but its actual outlet in the river is 230 ft. beyond the river-banks; the total length, including the special works at each end, being 3,370 ft. The contract price was nearly 34,000*l.*, the average cost of the whole, including the sewer for local drainage under the invert, the connexion of the house-drains with the under-sewer, the tide-flaps at the outlets, and other works, being about 10*l.* per foot run; but the cost per foot of the 3,050 ft. already named did not exceed 17*l.* 12*s.* 6*d.* per foot. The work is composed of Portland cement concrete and brickwork. The latter consists of bricks made at High Broom, near Tunbridge Wells. The brickwork is all executed in half bond. Only about 2,650 cubic yards of brickwork were used in the construction of the sewer, in combination with 16,000 cubic yards of concrete. Most of the cement was supplied by Messrs. Gibbs & Co., of Grays, in Essex, the remaining portion being supplied by Messrs. Burge & Barrow, of Rochester. The outside dimensions of the sewer are 17 ft. 6 in. by 14 ft. 6 in., and the average depth from the surface is 23 ft. Near the outlet the normal shape of the sewer is changed into three culverts, which are constructed at an increased inclination, being carried into the river under the foreshore 4 ft. below low-water mark, and about 100 ft. beyond the river wall. The gradients of these culverts are 1 in 20, the general rate of inclination of the sewer being 1 in 767. The outlet is intended to be protected by dolphin piles. Provision has been made, in case of emergency, for letting in tidal water, or carrying the excess over a weir 50 ft. 6 in. in length. Messrs. Pearson & Son, of Bradford and Westminster, are the general contractors, the works having been carried out under the direction of Mr. F. T. Hopkinson, their resident engineer. The works at the foreshore, which have yet to be carried out, will in all probability occupy from two to three months longer. The entire sewer, which curves considerably, and may in this particular be described as a repetition of the letter S, is laid on a bed of concrete, having a minimum thickness of 16½ in.

It is noteworthy that when the original works of the main drainage at this point were commenced in the autumn of 1859, the subsoil was charged with water to within a few feet of the surface. The effect of the main drainage works has been to reduce the water-line to the extent of about 30 ft., much to the advantage, in a sanitary point of view, of the residents in the locality.

Letts's Popular Country Atlas.—We may mention that in Part IV. of this publication, which includes the map of Essex, a special record as to the recent earthquake has been inserted, the points where shocks were felt being marked by red crosses, varying in size in proportion to the intensity of the shock at each point where it was felt.

A GRÆCO-ROMAN ALTAR FOUND AT MOUNT GERIZIM.

THE last number of the "Proceedings" of the Society of Biblical Archaeology contains a communication from M. Clermont-Ganneau, referring to the plate of an altar found at Mount Gerizim, published in the "Proceedings" of the Society for March last. M. Clermont-Ganneau writes:—

"I am indebted for a knowledge of this, one of the most interesting monuments hitherto found in Palestine, to M. Paulus, himself a sculptor of some talent, and resident in Jerusalem, and his Excellency Raouf Pasha, the Governor of Palestine, whose zeal and interest with regard to ancient monuments is worthy of all praise, and who immediately on the discovery of the monument took the necessary steps for its careful preservation.

The Ottoman authorities having, about the middle of last year, commenced some building operations at Nablous, the ancient Shechem, situated at the very foot of Mount Gerizim, a considerable number of fragments of sculptured marble were unearthed. The most important of these was a large pedestal of marble a little over a yard in height, and in section triangular, or rather hexagonal. The angles formed by the three broad sides were cut off so as to form three narrow ones, all covered with bassi-relievi and Greek inscriptions.

It is not certain for what use this pedestal was intended, but it resembles to some degree the triangular altar-shaped pedestals, which also bear sculptured decorations, and were used to support certain ancient candelabra. A Greek inscription of five lines runs along the highest portion of the cornice of one of the broad sides. The natural shadow of the cornice and the smallness of the photographs make it very difficult to make out the whole of this writing, but I have been able to decipher many of the words, and am satisfied from what I have made out that it is a metrical inscription.

Each of the three panels carved on the three large sides is divided horizontally into two compartments, the base-rie left in all representing scenes taken from Hellenic mythology. There are thus six subjects, some of which are explained by short Greek sentences carved on the field, giving the names of the principal actors in the scene represented. Those of the lower panels are most easily identified, and belong to the cycle of the legend of Theseus. They follow one another in a relatively logical order, and may be thus briefly described. The young hero is first seen raising the rock under which are concealed the sword and the shoes of his father Aigæus; three female figures, one of which we may suppose is that of his mother, take part in the scene. The second scene represents Theseus fighting with the Minotaur, being easily recognised from the bull's head; the young Athenians, to liberate whom Theseus has undertaken his mission, are standing aside, and the cavern-like opening appears to indicate the den of the monster. Some letters of the inscription upon this panel are visible, and I have been able to read the name *Meinotauros* in the accusative.

The victory of Theseus over Corynetes is represented on the third bas-relief, and the robber is seen stretched at the feet of the hero, who, standing upright over his fallen foe, leans upon his own club, and holds in his hand the iron club of the robber of Epidaurus. Near the body of the Minotaur stand three other figures, but they are too indistinct to be easily identified.

In the first of the three upper divisions are, on the left, Artemis, Apollo, and Latona, as we learn from the names carved over the head of each figure. The serpent Python is seen on the right, with his head pierced by the arrow of the divine archer. Passing to the left of the second upper scene is a figure, which is probably to be identified as Demeter, mounted in the celebrated car drawn by serpents. Under the shadow of a tree crowning a height is another female figure leaning on her right elbow, holding in her hand a palm or, it may be, a cornucopia, her breast being ornamented with a garland of flowers. This may, perhaps, be either the personification of some country intended to be indicated, or the representation of a telluric deity. The third and last of the series of upper scenes appears to have suffered greatly. The male half-kneeling figure, probably Hercules, is struggling with two serpents, and on both sides of this centre group two women are represented hastening away from the scene of the combat.

The altar or pedestal is of the Græco-Roman period, and is chiefly interesting from having been found on this site, as it must have belonged to the pagan temple erected on Mount Gerizim, so frequently to be found represented on the Greek Imperial coins of Neapolis. The manner in which Greek legends had become settled at Neapolis may be explained by the formation of an assimilation of more or less arbitrary character, such as was the custom between Athens and the ancient Shechem transformed at the Græco-Roman period, the time of the altar. Without at once insisting on this explanation, I will mention one or two facts which might be taken as bearing it out. The representations on the coins of Neapolis of Mount Gerizim upon which is the temple, approached by the grand flight of steps, bear a striking resemblance to the

Acropolis of Athens as found upon the Greek coins. Again, almost all the scenes represented on the altar are taken from the Attic cycle, or incidents in the legends of Theseus and Demeter. Finally, the name of Attic is certainly found in the inscription. But until we have copies of the inscriptions it is impossible to decide on this and other points, probably they would enlighten us on the reason of the dedication of the altar. I have sent a request for squeezes, and can only hope that ere long I shall be in possession of them."

THE TURKISH BATH FOR HORSES.

The Turkish bath has become an established institution in this country. Men of all classes now use it for sanitary as well as remedial purposes. Athletes of various descriptions find it invaluable in "training," and all the distinguished jockeys and light-weights keep themselves in condition by its use. It is natural to conclude that what is good for the man should also be good for the horse; and so it has proved. Messrs. Pickford, the eminent carriers, in their hospital for horses at Finchley, have had a bath in operation for more than eleven years, and find great benefit to the horses from its use. The bath is put in use three days a week, and is administered to over twenty horses in this time. The Great Northern Railway Company, at their new hospital for horses at Totteridge, are now erecting a very complete Turkish bath. It consists of three

THE PRESENCE OF BACTERIA IN BRICKS.

In estimating the durability of building materials, it has been usual to keep in view such mechanical and atmospheric influences as would affect the case in point. A new element has, however, been introduced into the question by the researches of M. Parize, to which the technical press of the Continent has lately given attention.

It has often been noticed that bricks in walls have become crumbly and powdery on their surface and for a certain depth, according to circumstances. The continued development of this process has resulted in many cases in the total destruction of the bricks. The explanations given have, as a rule, attributed these occurrences to the influences of moisture, excessive cold or heat, and occasionally defects in the manufacture of the bricks themselves. M. Parize declares these causes to be only of secondary importance in such cases, and bases his assertion on the following observations.

While examining in a casual way a brick party-wall in a building which was slightly damp, he noticed some blister-like appearances in several parts of the plaster. On piercing one of these a very fine red dust escaped, which was placed under a microscope of 300 times magnifying power. The dust was found to contain amorphous mineral formations and other substances but also an immense number of

Bauzeitung that these measures are of no real efficacy, if the organic germs of disease can vegetate and thrive in the internal portions of bricks.

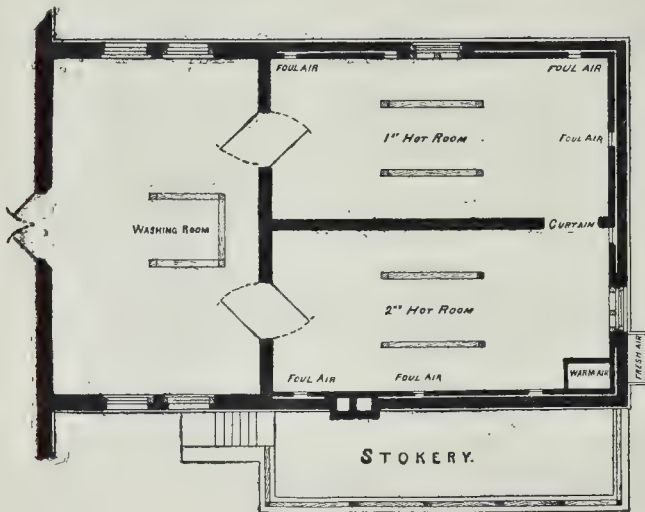
THE TEMPLE OF DIANA.

Mr. J. T. Woon delivered, in the British Museum on Wednesday afternoon, a lecture on the remains of this temple, which he discovered, and which now form such an interesting and valuable portion of the collection of Greek antiquities. The lecture was more or less of a popular character, and contained no fresh information or theory beyond what is already known to our readers. We regret to hear, however, that the attendance was very small; for there are plenty of people still, even among those who would be said to have had "a liberal education," who know next to nothing of the matter, who are hardly even awake to the fact that there are such remains in the Museum, still less aware of their exceptional artistic beauty and archaeological interest, and who might have learned something which they ought to know. The price put on the tickets (probably with the view of assisting the subscription for fresh excavations) must, however, have proved prohibitive to most persons except those who already had a keen interest in the subject, and they are exactly the persons who had no need of the lecture. We may take the opportunity of expressing our strong feeling that public money ought to be forthcoming to aid in the further prosecution of the explorations, which would be an honour to this country, and which Mr. Woon has carried to their present point with such remarkable success, after years of what may be called dogged perseverance in the face of discouragement and obstacles which would have daunted most men.

THE FRANCO FIRELESS ENGINE.

A RECENT circular gives some interesting information as to the cost of working the Franco fireless engine. This engine, as our readers may probably know, has no boiler, but contains a reservoir of steam at a very high temperature and pressure, which is continually drawn upon to drive the mechanism of the engine. It is not, of course, suited for long journeys, but is found to be very useful and effective for such purposes as working tramways or suburban railways. It has thus been used for some time on the tramway or light railway from Lille to Roubaix, and particulars of its performance are now given. It appears that the length of the line is altogether about 11,000 metres or eight miles, partly laid on ordinary rails and partly on a special tramway rail invented by M. Marssillon. There are gradients as steep as one in twenty, and curves having a radius of only twenty-two yards. The maximum weight of train, including locomotive, is twenty-five tons, and the speed about twelve miles an hour. The locomotive itself, when loaded, weighs about 9.8 tons. The pressure within the boiler is about 225 lb. at the commencement, and falls to 75 lb. at the end of the trip. Fifteen engines are employed altogether, working trains at twenty minutes' intervals; and these have run, in the course of the year, about 280,000 miles. Steam is supplied by six stationary boilers, costing, with their fittings, about 3,000l., whilst the fifteen engines cost about 12,000l.

The expenses of working are divided as follows, in francs per kilometre run:—Wages: driver, stokers, &c., 0.103; fuel (coal costing 15s. a ton), 0.125; oil, waste, lighting, &c., 0.014; maintenance and renewal of materials, 0.110; total, 0.352, or per ton kilometre 0.018. This is equivalent to about 0.6 pence per ton per mile, or 5.8d. per train-mile, which must be considered as exceedingly low. At Paris traction by horses is said to cost 1.1d. per ton-mile, and probably in many places it is still higher, whilst the cost of traction by ordinary locomotives has in most cases been found in excess of that by horse-power. Assuming the above figures to be correct, there certainly appears to be a future for the fireless engine. And this is so thoroughly recognised by the scientific world in France that, on a report by M. Tresca, the Academy of Sciences has just decreed to M. Franco the Montyon Prize for inventions or improvements useful to agriculture or the mechanical arts and sciences.



Ground Plan. Scale, 1-10th inch.

rooms. First, a large wash-room or grooming-room, from which is entered the first hot room or tepidarium from 140° to 150° Fahr.; from this room the horse, after being thoroughly acclimatised can, if necessary, pass on to the hottest room or caldarium from 160° to 170° Fahr., and without any turning round can pass on into the grooming and washing room again. This last room is slightly heated from the two other rooms, and in each are stocks in which the animal can be fastened if required. The heating is done very economically by Constantine's convoluted stove, and thorough ventilation is secured from the large volume of hot air constantly supplied, which passes through the baths, and as vitiated is drawn off by specially-designed outlets. The wash-room is supplied with hot and cold water, which can, of course, be mixed to any required temperature.

Water Supply, Stevenage, Herts.—The town of Stevenage is about to be supplied with pure water from the water-bearing stratum of the chalk, a copious and constant supply for its 3,000 inhabitants having been a want of long standing. Messrs. Bailey Denton, Son, & North, of Whitehall-place, are the engineers for the scheme, and Mr. Tilley, of Walbrook, London, has been entrusted with the well-sinking.

living microscopic organisms which moved with astonishing rapidity. The investigation was carried out with the utmost care and exactness, the dissolution of the red dust being undertaken only with distilled water or alcohol. The presence of these organisms, together with their activity and increase in such a position (under a layer of lime of at least ¼ in.) was curious, but a still greater surprise was in store for M. Parize. After he had cleaned with a stiff brush the surface of a brick which had been eaten away, he drilled a hole of about 1¼ in. into the brick, the interior of which possessed the normal degree of hardness. In the dust resulting from the operation the same organisms presented themselves as he had met with on the surface, although not in the same quantity, there being only 100 living organisms per square centimetre (15 square inch) of the preparation, instead of 150. All the bricks taken from the wall in question displayed the same appearances, both on the surface and internally.

M. Parize considers that his discoveries prove the unlimited vital powers of these microscopic organisms. He urges the necessity of carefully disinfecting rooms, infirmaries, stables, &c., in which there have been cases of infectious disease. The scraping of the walls and their fresh treatment have been the only means hitherto employed for the destruction of such germs of disease as have been deposited. It is, however, remarked in the *Wiener Allgemeine*

SOME CONSIDERATIONS TOUCHING TECHNICAL EDUCATION.

SIR,—The arguments for technical education are founded on the assumption that the markets of the world demand the exercise of the highest technical skill. This may be open to dispute. Those markets rather require products in which the cost of skill is graduated to meet the demands of purchasers of varied means. Nevertheless, that premises may be accepted as the ideal basis of such arguments.

Lectures on the history of art are exceedingly popular, but have hitherto failed to teach the public that in the greatest epochs of technical skill, in Greece, in Italy, in the time of Louis XIV. in France, and in the Adams period in England, there were no such institutions as now proposed; nay, that physical science was scarcely thought of. Those periods made their mark in time, by either great or leading artists dominating the higher industries. It is not to be done by mechanic draughtsmen, dominated by pounds, shillings, and pence masters.

In discussing the subject of technical education we should recollect that France, Germany, and Belgium had instituted a system of technical instruction whilst England still monopolised the markets of the world without any such system. And for what purpose did foreigners institute this system of technical instruction? Was it not because they were without workshops, and desired to force their manufacturing industries? Foreign Governments had recognised the advantages of manufacturing and shop-keeping, and had resolved to obtain for their people stalls in the markets of the world. England, however, be it recollected, had obtained her supremacy in

manufacturing level in skill. The foreigner would be placed on this greater equality, too, to the disadvantage of the English workman. Steam has brought all the markets of the world next door to our own, and has made all the rest of the world, for the time being, our rivals in skill. Therefore, I would call the attention of the British public to the fact that it will be impossible for England to steal a march upon Continental skill by cramming the workman with scientific knowledge. The only possible way of accomplishing such a feat would be by a formative system of training such as that established in ancient Greece, and thus developing higher personal qualities and higher organisation.

W. CAVE THOMAS.

LINEAR PERSPECTIVE.

SIR,—The construction following may often be used with great advantage in the perspective delineation of a building. It is a practical application of a principle of linear perspective which is one of a series of propositions in a small unpublished treatise, written during an interval of leisure. I have not given the geometrical proof of the process, because that would take up too much space and necessitate the introduction of other matter from the MS. to make the demonstration complete.

Of course, it is possible that I have been anticipated by one of the many writers on the subject in this attempt to improve on ordinary methods, but I am quite sure that the rule I have given is unknown to many of your readers who would often find it a real help.

Given the plan of an object to be delineated in perspective, it is well-known that the positions of all vertical lines in the picture may be

will be $S'A'O'$, and the radials must be produced backwards to their intersections with the vertical.

The practical convenience of the above method is that the perspective-lines of all parallel horizontals, at various heights and in different vertical planes, may readily be found by means of a geometrical elevation or a direct transverse section, and a single line of heights.

In this way the perspective-lines of steps, pilasters, string-courses, cornices, ridges, intersections of walls with sloping roofs, &c., may be drawn by one and the same process, without the varied and complicated contrivances usually employed. It is, too, no small advantage that the chief lines of construction are not drawn on the plane of the picture.

HENRY R. BROWNING.

St. George's Vicarage, Stamford.

GERMAN ART SCHOOLS.

SIR,—I read in your last week's number some observations of Mr. Conradi on what I said at the Architectural Conference [see p. 723, ante] on the Zurich School of Architecture.

Mr. Conradi says:—"I know nothing of the Academy at Zürich, but it is no German academy; and if Mr. Harvey stigmatises it as a schoolboy system, it can have no resemblance to the German academies at Berlin, Dresden, Munich, Vienna, and others."

Nothing is easier than to prove the correctness of my affirmation about the School of Zürich, for the programme and horarium of that school show at once that the studies are cut up in lessons just as in any boys' school. Amongst the subjects of study the one which took most of our time was differential and integral calculus

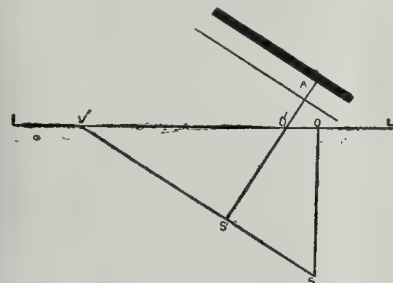


Fig. 1.

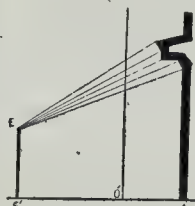


Fig. 2.

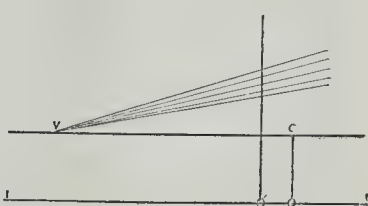


Fig. 3.

technical skill in the workshop, and not by any system of technical schools. But when she found that her monopoly in manufacture was threatened, she became alarmed, and ascribed her contracting commerce to the influence of the foreign technical schools. She lost her presence of mind, and forgot that she had been by the process, not "of the sun's," but of her boasted steam power, rendering her manufactures less dependent on personal qualities or human dexterity. She does not appear to have taken into consideration the fact, that in the same degree that her manufactures became less dependent on human skill, would it become easier for foreign capital to compete with her, for the foreign capitalist could also employ machinery. And if England still insists on technical skill being attained by, as it were, a mechanical system of instruction, she will only continue to aid the foreigners still more advantageously, to compete with her. The English workshop has, in the main, been the best technical school in the world. It has piled up the wealth of England. The public, however, is now beginning to find fault with, and exhibits a disposition to meddle with, it. They are possessed with the absurd notion that better workmen can be made for the factory by scientists, than in the factory, as of old time; and this absurd notion is founded on the still more absurd notion, that the skill of the workman depends upon the amount of his scientific knowledge, whereas it depends upon something utterly different, viz., upon human qualities and training.

Say, however, that a system of technical instruction can be perfected independently of the workshop, so could it also be by other nations. What we can institute they can institute, and the nations would, in this respect, soon be on a

readily found by means of radials to the station-point.

This simple process suggests the possibility of a corresponding method of determining the perspective-lines of horizontal parallels by means of radials from the various points of a geometrical elevation or transverse section.

Fig. 1 is the ground-plan of the frontage of a building, showing the projection of a horizontal cornice.

S is the station-point of the spectator; S O the distance of the picture; and I L the base of the picture, or the intersecting line.

Through S draw S V' parallel to the frontage; and through any point O' in I L draw a transversal meeting the parallels at right angles in A and S'.

Fig. 2 is a direct transverse section of the frontage and cornice.

From the frontage at A on the ground line set off A O' and O' S' from fig. 1; at O' erect a vertical; and set up S' E equal to the height of the spectator's eye.

From the several members of the cornice draw radials to E, intersecting the vertical as shown.

In Fig. 3, which represents the plane of the picture, set off the distance O O' from fig. 1; at O' erect a vertical, on which set up the intersections from fig. 2, and, through these intersections, draw radials to V, the vanishing point of horizontals parallel to the frontage, the point V being found by measuring on the horizon a distance V C from the centre of the picture equal to V' O' in fig. 1.

Then the radials to V are the perspective-lines of the visible members of the cornice.

When the point O', in fig. 1, is on the right of the intersecting point of the line of frontage with I L, then the order of the letters in fig. 2

and I remember that our copy-books of notes were regularly examined by the Professor in a way that would have done credit to the master of a Board School.

Secondly, Zürich belongs geographically to Switzerland, I admit, and thereby may be denied the title of a German town; but when we consider that nearly every professor of its School of Architecture was a German,—Semper, Lübke, Kinkel, Gladbach, Lasius; that amongst the students, the Germans far outnumbered the Swiss; that they had come to Zürich from Vienna, Munich, Leipzig, Dresden, Berlin, Pesth, and other places,—we cannot escape the conclusion that the School of Architecture of Zürich was essentially German, and also must have been at that time considered superior to all the other schools of Germany.

The secret of the misunderstanding between Mr. Conradi and myself is not far to seek. I gather from his letter that he was a pupil of Semper at Dresden; that must have been some time between 1834 and 1848, for after that time Semper was exiled from Germany, on account of the part he took in revolutionary tumults. Semper had organised the Academy of Dresden in his own way, utterly ridding it of the pedantic traditions of German schools; he possessed vast erudition, such as never has been acquired by any other architect, combined with a creative genius which places him on a par with the greatest artists of all times; he was then young, enthusiastic, and absolute director of the Dresden School. Therefore, Mr. Conradi, his pupil, has unknowingly been placed in circumstances far superior to anything else existing in Germany, and he is living in dreamland when he thinks the paradise of a school he enjoyed in Dresden was only a specimen of German Art Schools. The illusion is natural enough, but

one has only to read Semper's observations on German schools to see that it is but an illusion.

As to art-teaching, Semper says, "The man who intends to be an artist should possess a high general education, and, thus armed, be thrown at once into the practice of his art." He should be left to find out by himself what information he wants and offered by the means of getting it; in this way his learning will partake of the character of self-made discovery, and thereby possess a vitality which knowledge obtained by cramming entirely lacks. To be fruitful art should be the result of experience rather than of the teaching."

In his book "Der Styl," Semper points out as his ideal of an establishment for forming architects, the Ecole des Beaux Arts in Paris, such as it existed in his time, with its liberty, its rivalries of masters, its opportunities for designing, and facilities for acquiring knowledge, and Semper advised me and many of my fellow students to complete our studies at Paris, as what we had learned in Zurich, from the want of resources of the place, was quite insufficient, if we wanted to take a high position in our art.

LAWRENCE HARVEY.

"THE MYSTERIES OF COLOUR."

SIR,—In a lecture on this subject delivered by Mr. G. A. Storey, A.R.A., and reported in last week's *Builder* [p. 768], the following remark occurs which should not be allowed to go unchallenged, "Let them consider colour in the same light that they considered language, namely, that it had an alphabet. . . . The letters consisted of the primary and pure tints—the red, blue, and yellow,—which could not be composed. They are the simple elements which compose all the other colours, and which were the A, B, C, and all their short alphabet." Surely the artist is a little behind-hand in his knowledge of colours. Scientific men believe that the primary colours are red, green, and violet, and have ample evidence that yellow is a compound of red and green, and blue of green and violet. This may not be the result of a mixture of some pigments, but it is the result of the mixture of coloured light; and a "School of Colour" founded on one unscientific basis could not, I think, have a long or very successful existence.

C. ROBERTS.

*** We have ourselves drawn attention, on previous occasions, to the curious manner in which painters ignore the modern accepted scientific basis of colour. The excuse, perhaps, is that most painters actually work with mixed pigments, and not with mixed light, and therefore take the result of this rough method as the scientific result. It is possible, we believe, to produce secondary colours in painting by the juxtaposition of minute and brilliant touches of primary colour; in such a case the result would depend on the mixing of reflected light on the retina; and here the practical necessity for a correct scientific theory is obvious.

CONSTANT WATER SUPPLY IN ST. PANCRAS.

SIR,—Thanks to the recommendation of the *Builder* (Jan. 26), and the agitation which the demands of the New River Company a short time since created, the company has reduced its expensive and arbitrary "requirements" from ten to three; but these latter are equally obnoxious and unnecessary. Previously to the alterations called for by the company, we had in most houses a cistern daily supplied with water fresh from the main, from which the water-closets were kept pure by a flow of water without stint, the water being thus constantly changed. This was the boast of the companies in opposition to the proposal for a supply by meter. But now the New River Company has made a fresh demand, and insisted upon what it calls "waste-preventers" being set up, which are really obstructions to the purity of the closets; for instead of impurities being duly carried away with a thorough flush of water there is just a puff enough to make a stoppage, which is increased by the next puff, and so on *ad infinitum*, thus adding to the danger of poisonous effluvia accumulating in every water-closet. Each householder is thus kept in a state of alarm, and the owners are irritated at the wasteful and needless expense of changing good fittings, which were both simple and healthful, for complicated appliances, which are both expensive and liable to get out of order, as well as dangerous to the sanitary well-being of the people. In fact, the waste-preventers, as Mr. Rich said at the Architectural Association (*Builder*, p. 476), are a nuisance,

and the sooner they are prevented, the better will it be for the community at large.

A HOUSEHOLDER IN ST. PANCRAS.

*** Waste-prevention is perfectly right in principle, if only it be carried out by suitable methods, and in moderation.—Ed.

A PHILANTHROPIST INQUIRY.

SIR,—Having been subscribers to your journal for many years, we feel sure that you will be pleased to ask for us, through the medium of the *Builder*, for information as to the best manner of working a sick-club in connexion with a builder and decorator's business where an average of about 100 men are generally employed. If any such firm would kindly forward us a book of rules, we should deem it a favour.

SPRAKE & FOREMAN.

11, Pont-street, Belgrave-square.

A QUESTION OF BOUNDARIES.

SIR,—Will you, or any of your readers, kindly inform me what is the strict rule in measuring the boundary of an owner's land who is entitled to the ditch?

I believe that in Middlesex a point 4 ft. from the root of the hedge is usually taken, and I shall be glad to know whether this is absolutely correct and can be taken to be the legal boundary?

A SURVEYOR.

WHITE APPEARANCE IN BRICKS.

SIR,—I have bricks made in my yard which throw out a white appearance, very damaging to the outer look of a house. Can you recommend any remedy? It is supposed to be salt, and unfortunately does not disappear in the course of ten or eleven years.

P.

CHURCH BUILDING NEWS.

Cardiff.—A new church, dedicated to St. David, is to be built at Cardiff. Messrs. Pugin & Pugin, of Westminster, are the architects. —The bell-tower of St. Peter's Church, Roath, Cardiff, is fast approaching completion. Its style is in keeping with that of the church, which is Early English. The Angels tower, of which the foundation was laid about twenty-six years ago, circumscribed the design of the architect to a great extent in consequence of the base of the tower being already laid, which is constructed on the south-west corner of the church terminating the lateral aisle consisting of four stages, terminating with the belfry, built with massive rubble masonry and faced with Pierpoint ashlar, with Combe Down Bath stone window-dressings. The first stage is plain and massive, relieved with belts and string courses; each succeeding stage increases in architectural detail and richness as it rises above the buildings of the locality. The tower will be crowned with a moulded cornice, upon which will set four turrets on the angles. Between the turrets will be constructed a perforated parapet. The entire height of the tower when finished, with the turrets and parapet, will stand 112 ft. over the surface of the street. The bells will be suspended on a framework of pitch-pine, 4 ft. over the level of the window-sills, so that the wave of transmission from the bells may escape the belfry unbroken, rendering the tone more perfect. The framework upon which the bells rest will be quite detached from the tower, supported by upright beams resting on massive corbels in the angles of the first stage, thereby throwing the entire weight of the peal of bells near the base of the tower. The original intention was for a tower and spire. The architect, on receiving instructions, prepared two designs, one for a tower and spire, which was exhibited in the church for subscriptions; the other a west front elevation and tower only, terminating with angular turrets of the height already mentioned and filled in between with a perforated parapet. This the Marquis of Bute, in his usual generosity, undertook to erect at his own expense. The architect of the works is Mr. John J. Hurley; the builder Mr. James Hitt; and the clerk of works is Mr. P. Hartigan, both of Cardiff.

Batham.—On Thursday the 22nd inst., being Ascension Day, the Bishop of Rochester consecrated the new Church of the Ascension, which has just been erected near the Batham high road, a short distance from Clapham Common. The structure is a large and handsome edifice in the Gothic style, and is of red brick, with stone facings and dressings. It is cruciform on plan, consisting of nave and two side aisles, tran-

septs, chancel, vestry, and narthex. The internal arrangements and decorations are elaborate and costly. The length of the nave, from the narthex to the chancel, is 80 ft., and it is 36 ft. in width. It is divided from the aisles by an arcade of flat Gothic arches, with pierced tracery work above, surmounted again by three-light clerestory windows. The nave roof,—upwards of 60 ft. in height,—is an open timbered one, divided in diagonal panels, the arched ribs of the principals springing from stone corbels. The narthex, at the extreme west end of the edifice, is separated from the nave by an arcade, and encloses the baptistry, the floor of which, and a dado surrounding it, are composed of Mosaic and encaustic tiles. The font is in marble, with alabaster columns. The chancel is the same width as the nave. The depth of the chancel from the nave approach to the sacristy is 22 ft., the sacristy being 14 ft. deep, and the extreme depth of the chancel 36 ft. The chancel is approached from the nave floor level by a flight of seven steps, the floor to the sacristy being paved with encaustic tiles, and that portion of it within the sacristy with mosaic. Beyond the altar-table there is an open arcade, consisting of three Gothic arches. On the north side the chancel is divided from the transept by an elaborate Gothic screen in Portland stone. The pulpit, a costly structure in marble and alabaster, is not yet finished. The seats in the body of the church are in pitch pine, and the clergy and choir stalls are in panelled oak. The church will seat upwards of 1,000 persons. The tower and spire, as well as the vestries, have yet to be built. The cost of the church when completed will be about 15,000l. Mr. Arthur Cawston, of Spring-gardens, is the architect, and Messrs. Bowyer, of Upper Norwood, are the contractors. Messrs. Hitchcock & Bland are respectively clerk and foreman of the works.

Books.

Biographies of Working Men. By GRANT ALLEN, B.A. "The People's Library." London: Society for Promoting Christian Knowledge, 1884.

In two hundred pages, clearly written and clearly printed, Mr. Allen recounts the interesting lives of Telford, Stephenson, Gibson, Herschel, Millet, Garfield, and Edward. Their careers,—distinct in every other respect,—have this in common, that the success of them was due, not to chance, but to purpose. It is curious to notice how, in some cases, the bent of mind has been shaped by circumstances, and how in others it has had to struggle against them. Telford began life as a stonemason, and ended it, by a sort of natural development, as the prince of road-makers. On the other hand, Edward's craft of shoemaking in no degree contributed to his success as a naturalist, but rather militated against it. In the Herschel family (which was of Jewish origin) there seems to have been a strong hereditary taste for philosophy and music. May not the astronomical genius of William Herschel, the organist, have been a result of this combination? There is assuredly some resemblance between the harmony of heavenly bodies and that of concerted sounds, and the mind which could be affected by the one would scarcely be indifferent to the other. In what is avowedly a compilation we do not look for originality, but Mr. Allen is entitled to the credit of having done his work carefully and pleasantly. The biographies which he has abbreviated from Smiles's well-known volumes are satisfactory, and those of Gibson the sculptor, and Millet the painter are not the less interesting because they are less familiar.

In the Slums. By the Rev. D. Rice-Jones, M.A. London: Nisbet. 1884.

This is a graphic, but not sensational, account of how the poor live in that miserable district which lies between Drury-lane and Lincoln's Inn-fields. The evils of overcrowding and of unsanitary dwellings are as great there as in Stepney and Whitechapel, and the population is probably less industrious,—casual employment at theatres not being conducive to habits of steady toil. The district is convenient for philanthropists, but, somehow or other, does not seem to have attracted them. Perhaps Mr. Irving might like to do something for a neighbourhood on which the "play-houses"

have exerted an influence for more than two centuries.

The Student's Guide to the Practice of Measuring and Valuing Artificers' Works. Fifth edition; thoroughly revised, with considerable additions, by E. WYNDHAM TARN, M.A., architect. London: Crosby Lockwood & Co. 1884.

THIS book has evidently met a want in its day. It was first published by Weale in 1843,—the greater portion of the work being supplied by an eminent surveyor retired from practice, who died before he had completed it ready for publication. In 1852, and again in 1858, Mr. E. L. Garbett edited it,—making such additions as he deemed advisable,—some of them odd in manner, and some people thought the matter a little wide of the purpose. Mr. Tarn added to it and altered it largely in 1871, but the book was the same general aspect. The present edition is altered in form; the book has lost height and width, has a smaller number of pages, but a good deal more on each page,—and is more handy in consequence. The additions are mainly in the "Explanations and Technical Terms"—a sort of unalphabetical dictionary of most of the parts of, and materials in, a building. Special foundations, selenitic cement, shoring, needling, lifts, earth closets, and pneumatic bells, may be selected as examples of new paragraphs. The rules for the thicknesses of walls, for calculating the sizes of wooden posts, iron columns and stanchions, wood and iron girders, and the information with respect to sizes of timbers in floors, and in the parts of wooden and iron roofs go somewhat beyond the original intention. There has evidently been a wish to make a kind of general handbook as far as space would allow,—special attention being given to the wants of the average reader, coming to the work very fresh and uncorrupted with preliminary knowledge.

Reminiscences of the first edition,—a kind of "outliers,"—appear occasionally still. On p. 24 we have,—"a load of statute bricks is 500." There is a bit of history here. The 17th Geo. III., cap. 42,—which stipulated that all bricks made for sale should, when burned, be not less than 8½ in. long, 4 in. wide, and 2½ in. thick,—was recognised by the retired surveyor who wrote the book as a fixed, practically unalterable, thing. On p. 25,—"a ton of iron is 2,240 lb. weight." On plate ii., *plowed heading* is an orthographical survival, now very rare. On p. 101,—"In measuring roofs take the highest timbers first, . . . and so to the eaving floor," is apparently a puzzled compositor's snatch after *joists* nearly a couple of generations ago. On plate iii. are "framed chimney-grounds" which the whirligig of time may bring into vogue again, but not to the world's advantage. Wood angle-staffs (p. 108) are practically obsolete. These are, however, mere curious trifles,—albeit interesting in one way or another.

As to earth closets on upper floors (p. 220),—"a straight pipe, 12 in. diameter, leading to a vault or receptacle below," we strongly advise no one to think of such an arrangement if he can possibly avoid it. Page 222,—"either the gauge or weight per foot of zinc should be described,"—it is better always to describe the weight only. The amount of gas delivered does not depend solely on the bore of the supply-pipe (p. 223); the pressure and the length of the pipe must be taken into account. Chapter X. deals with Dilapidations, Repairs, Contracts, and Ancient Lights, and twenty pages are used to good advantage. A caviller might complain that measuring,—taking off, abstracting, billing, and valuing,—occupies hardly one-fourth of the volume. The principles are laid down, and should be well mastered by every student before he has been long in an office. After a good deal of active practice in surveying when the young man reads it all again he may be disposed to rank himself among the cavillers; but may find himself not long afterwards recommending a junior to study well all that there is in it. He will not find much about modern methods,—such, for instance, as that which finds most favour with London surveyors nowadays,—who take off the work of the carcass and then take the finishings, and find considerable advantage when they have to refer to the dimensions in order to adjust variations at the end. Neither will he find some other devices mentioned by which a man in constant practice manages to expedite his work,—such as getting the sizes of doors in the joiner through the brickwork dimensions, collecting the walls

already taken for damp courses, shortening the bills by giving averages as for widths of rough arches, sizes of stone templates, lengths of iron bolts, &c. It is true that most of these, and many more than any one would attempt to note down in a book, will be learned best by contact with actual work, and from a man's own wits if he has them about him. For quantity surveying,—as for most other things,—a man must have plenty of them about him, if he intends to make a good income in the course of doing good service for his employers. Parents will do wisely not to put dull boys to the profession; and agile-minded ones must have plenty of staying power, and firm health besides. Work must often be very rapidly turned out,—pace in those cases seeming indeed the principal requisite in everybody's eyes, till the day of reckoning arrives. The original author of "The Student's Guide," who, having had fifty years' experience before 1843, must have been at work at his profession in the last century,—probably knew something of Old Leisure in his day, and let us hope contrived to get along very well without the alternations of mad haste and enforced idleness which worry us so much.

The *Builder* has never hesitated in pointing out that the best course is that the architect and quantity surveyor shall be separate persons,—not, however, imputing or even suggesting any imperfect or perfunctory performance of the work when they are not. Architects who take off their own quantities,—as the speakers at the late Conference recognised that in the country they must generally do, at any rate for their smaller works,—would urge that they are willing to take a good deal of pains, and to do very thoroughly with a little more effort what some others can do with less. It is natural for any one to resent being told that he is not so ready as we have been made by the hard discipline of much practice; but an error to show that bile is so easily raised when skill is injudiciously vaunted. There is a good deal of human nature in the expert taker-off,—the "accomplished surveyor," as at times a specimen will call himself; and his coxcombry, when he states that he knows he can do something extremely well, resembles coxcombry in general. Thoroughly capable people, indeed,—if possessed of other virtues,—do not give themselves caressing names.

We have no longing for the extinction of local peculiarities, which are founded on reason mainly, though partly on usage. Mr. Tarn, in his preface, goes a little too far when he hints that they have, for the most part, disappeared; and that the disappearance is necessarily in the times every country in England may be said to have had its own especial style of building, arising partly from the nature of the materials found in the locality, and partly from peculiarities in the climate." It will be a pity if,—owing to the rapidity and ease with which various materials are conveyed from place to place,—it should ever be otherwise, except when the local materials are very inferior and comely work cannot be turned out with them. Still, there is a tendency in this direction, and, kept within proper bounds, it may have wholesome results. There is, doubtless, also a tendency towards an assimilation of the methods of building, contracting, and measuring artificers' work. The causes which have been at work in London and the neighbourhood are, and will be, at work elsewhere.

Mr. Tarn has made the constants of labour apply to hours instead of days, which is an improvement. Pleasant little homilies acent the growing disposition of the workman to do less work in the same time, might be founded on such tables of constants; which, albeit liable to human error, probably only share that liability with the general imputation and any universal repudiation of it. Salmon, of "The Country Builder's Estimator; or, the Architect's Companion," writing in the middle of the last century, observed that "A Trowel-man and Labourer, although but slow, can perform one Rod of rough Work in five Days," the day being probably more than ten hours, as assumed in recent lists of constants. The early editions of "The Student's Guide" gave 4,941 days of a bricklayer and labourer for the execution of a rod; Hurst has recently given 3,908 to 5,132 days, according to the thickness and difficulty of the work; and Mr. Tarn has revised his list, and made it 425 hours according to his new method.

Strains in Ironwork: a Course of Eight Elementary Lectures delivered before the Society of Engineers, Session 1882-3. By HENRY ADAMS, M.Inst.C.E., M.Inst.M.E., F.S.S., &c. London: E. & F. N. Spon, 16, Charing-cross. New York: 35, Murray-street. 1884.

MR. ADAMS, M.I.C.E., &c., presents us with a course of eight elementary lectures, delivered before the Society of Engineers, 1882-3, on the "Strains in Ironwork." His little work treats the subject in a very elementary though clear and concise manner,—a method of treatment which will be found particularly useful to those who desire to obtain a knowledge of the subject, and possess but little mathematical skill. The author opens with a short dissertation on those properties of wrought-iron, cast-iron, and steel which relate to the power of resisting tensile and compressive strains. Then, commencing with the very simplest form of mechanical power, "the lever," he leads us by easy stages to the composition and resolution of forces; force and polar polygons, reciprocal diagrams, &c. The work is amply illustrated; consisting of 65 pp. octavo; the figures number 172. Of course, in so small a work there must necessarily be very much relating to the subject which is omitted. The author, however, promises us a more advanced course which will no doubt fill up many a gap, and if treated in the same clear and simple manner, will undoubtedly be a great boon to many readers. His definitions of "strain" and "stress" do not appear consistent with those generally received. Although it is of very little importance what words we use to describe the different forces met with in structures, still it would be of great advantage to the student if there were some sort of consistency and agreement amongst writers. There is, however, great laxity in the use of the terms "strain" and "stress," especially amongst modern writers. The author defines "strain" as "the change of form produced in a piece by the action of a load," and "stress" as "the resistance set up in the material." Surely the strain is not the change of form itself, but that which causes it.

The older writers, as Tredgold and Barlow, and many of the moderns, as Du Bois and Hurst, confine the meaning of the word "stress" to the external force or forces which produce internal strains; while Alexander, the author, and many others, make free use of such expressions as "internal stresses," applying the term "stress" to the material of a piece as others do to the structure. Thus they would say a piece has to sustain a stress of four tons per square inch of sectional area. It would, however, be better to confine the word "stress" to express the external forces, especially making use of it when they cannot be properly expressed by the word "weight" or "load," and apply the term "strain" to the internal forces produced by the weight, load, or stress, the term "strain," with its various qualifications, being all-sufficient to define clearly the nature of the various interior forces. The author has given, at the end of each lecture, a number of test questions, which will be found very useful to enable the student to satisfy himself that he has thoroughly mastered the subject of the lecture.

This work will be found a very useful and handy little book, containing a great amount of information in a small space, and yet entering into principles sufficiently to satisfy the student of the truth of the deductions, and thereby fix them in his memory. And those who attended the author's lectures, as well as general readers, will do well to possess themselves of so handy and easy an introduction to graphic statics.

Electric Light in Collieries.—A most satisfactory and successful electric light installation has just been completed at the Park Pit Ocean Collieries, South Wales. The motive power is supplied by a 6-h.p. Marshall engine, fitted with Hartnell's patent automatic expansion gear, driving a Crompton-Burgin self-regulating dynamo. There are fifty 20-candle-power Swan incandescent lamps distributed underground and on the surface over the screens, workshops, and engine-houses. The novel feature in the installation is the very successful manner in which the bottom of the pit is lighted, and 150 yards of the workings, as far as the main engine roads. The work has been carried out by Mr. J. C. Howell, Llanelly, agent for Messrs. R. E. Crompton & Co., assisted by the officials of the colliery.—*Electrician*.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

May 16.—7,806, A. A. Collis, Cardiff, Ventilating Water-closets.—7,809, J. Perriman, London, Ventilation.

May 17.—7,838, H. Steven and J. Walker, Glasgow, Cast-iron Skylight Frames.—7,864, C. Inwood, Burton-on-Trent, Hot-air and Ventilating Apparatus.—7,886, B. Swaine, Leeds, Door-knobs or Handles, &c.

May 20.—7,946, H. Talbot, Manchester, Flue Bricks.—7,948, G. A. Nebeling, Remscheid, Germany, Metallic Coverings for Roofs and Walls.—7,960, W. L. Gregg, Philadelphia, U.S.A., Brick Machines.—7,972, D. T. Bostel, London, Water-closets and Urinals.—7,983, J. W. Perkins and R. W. Perkins, London, Metallic Baths.

May 21.—8,017, J. Woodman, London, Cleansing Drain-pipes.—8,018, M. Syer, London, Electrically-operated Valve for Flushing Cisterns, &c.—8,028, J. Mountain, Sheffield, Water-closets.—8,032, G. F. Twist, Coventry, Connecting Sinks with Drains.

May 22.—8,071, W. Leggett, Bradford, Opening and Fastening Sliding Windows.—8,073, J. Kays, London, Latching and Unlatching Doors.—8,091, F. Cuntz, Karlsbad, Austria, Automatic Flushing-tank.

SPECIFICATIONS ACCEPTED.†

May 23.—5,706, W. M. Simons, Nottingham, Roller-blind Furniture.—6,428, E. Edwards, London, Deteriorating Alarm for giving Warning of attempt to force Doors, Windows, &c. Com. by H. Gibbott, Paris.—6,486, W. H. Pike, Liverpool, Combination of Bell and Door Knob or Handle.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending May 24, 1884.

4,662, C. H. Fitzmaurice, London, Apparatus for Ascending Towers, Spires, &c. (Oct. 1, 1884, price 2d.).

A framing is built round the tower, &c., on which are mounted two or more horizontal shafts carrying wheels with elastic tyres; and the shafts are geared together to revolve in opposite directions, and are adjustable so as to be capable of being pressed hard against the cover; and then, when the shafts are revolved, the wheels grip the surface of the tower, and the framing ascends or descends. (Pro. Pro.)

4,697, W. R. Lake, London, Water-closets, &c. Com. by J. P. Putnam, Boston, U.S.A. (Oct. 2, '83, 1s.).

The chief feature of this invention is the dividing the flushing stream into two. The lower flush enters the bottom of the basin, divided by a rose into several minute streams, and forces the water, &c., in the bottom of the basin up through the trap-bend in the side thereof. The upper flush enters a chamber on the outside of the basin, in which is always a body of water, and overflows from the top of the chamber into a flushing rim round the basin, thus cleansing the sides thereof. [Several other modifications are described in twenty pages of specifications, stated in thirty-three claims, and illustrated by eleven figures in the drawings, but which are not capable of being condensed within our limits.]

4,715, H. J. Allison, London, Coloured-glass Windows. Com. by J. La Farge, New York, U.S.A. (Oct. 4, '83, 4d.).

A light metallic framework is substituted for the usual "leading," and a thin sheet of glass is placed on one or both sides of the coloured glass. (Pro. Pro.)

4,808, A. J. Boulé, London, Venetian Blinds. Com. by J. B. Querre, Toulouse (Oct. 9, '83, 2d.).

The supporting chains for the blind are attached to the lower lath, and pass through all the laths, as is usual. They then pass over pulleys in the top lath, along the upper side of the same to pulleys mounted on the side frame of the window, &c., and the ends are connected to counter-weights. (Pro. Pro.)

4,825, G. W. Davis, Birmingham, Attaching Door-knobs to their Spindles (Oct. 10, '83, 2d.).

The free end of the spindle is circular in section, and a slot is formed therethrough. When the handle is screwed on a pin is passed through a hole in the neck of the knob through the slot into a recess on the opposite side of the knob. (Pro. Pro.)

MEETINGS.

SATURDAY, MAY 31.

Cardiff Architectural Sketching Club.—President's Address. 7.30 p.m.

MONDAY, JUNE 2.

Cardiff Architectural Sketching Club.—Excursion to Margam Abbey.

WEDNESDAY, JUNE 4.

Shorthand Society (86, Chancery-lane).—Exhibition of stenographic curiosities. 8 p.m.

British Archaeological Association.—(1) Mr. C. Roach Smith on "The British Oppidan at Old Winchester." (2) Mr. E. V. Loftus Brock on "An Ancient Chapel at Dover." (3) Mr. J. W. Grover, on "Mount Nod, Clapham." 8 p.m.

THURSDAY, JUNE 5.

Royal Archaeological Institute.—(1) Mr. J. G. Waller on "Fourteenth and Fifteenth Century Brasses." (2) Mr. J. T. Micklethwaite on "The Wall Paintings in Pencon Church." (3) Mr. A. H. Church on "Some Roman Pottery." 4 p.m.

Royal Institution.—Professor Dewar on "Flame and Oxidation." (VII.) 3 p.m.

Chemical Society.—8 p.m.

SATURDAY, JUNE 7.

Association of Public Sanitary Inspectors.—Annual Dinner at the Holborn Restaurant. 6 p.m.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

Miscellaneous.

British Archaeological Association.—At the meeting of this Society on the 21st inst., Mr. Thos. Morgan, F.S.A., in the chair, the first paper was by Signora Campion, "On the Antiquities of the Ancient City of Luni, in Italy." In the lady's absence, the paper was read by Mr. E. Walford, M.A. It was from this port that, we are told, vessels sailed for the siege of Troy. Claudius made it his port of debarkation when he undertook the conquest of Britain. Many antiquities are constantly being met with in the locality, and masts of vessels are sometimes found. The second paper was by Mr. W. de Gray Birch, F.S.A. It was descriptive of a fine stained-glass figure of a lady in Long Melford Church, Suffolk, shown in facsimile by a drawing by Mr. Watling. The figure is that of Lady Anne Percy, then wife of Lawrence Rainsforth, Kt., and probably the youngest daughter of Hotspur, and not the first or second, as has been believed. The lady's third husband was Sir R. Vaughan. She is represented in a kneeling posture, clad in a red heraldic robe, on which are the arms of the Dukes of Brabant and Lucy, while on her ermine-lined mantle are those of Rainsforth and Brokesborne. This is the earliest known portrait of any member of the Percy family.

The "Temple Gardens Hall" on the Thames Embankment.—This is the name which has been given to a temporary building of corrugated iron just erected on the Thames Embankment by Messrs. Croggon & Co., of Upper Thames-street, for Messrs. Moody and Sankey's services. The building has been erected on a portion of the land lately belonging to the Corporation, immediately to the west of the new City of London Schools. It is of large dimensions, being upwards of 250 ft. in length, and nearly 200 ft. in width, occupying a ground area of between 45,000 and 50,000 superficial feet. It consists of three bays, the roof being supported by a large number of lattice and cross girders, resting on iron columns. The interior walls are lined with timber. At the south end there is a platform extending across the entire width of the building, whilst at the north end, as well as on the east and west sides, there are rows of seats raised from the floor-level to a height of about 20 ft. It is stated that the building will seat an audience of 5,000 persons. It was opened for Moody and Sankey's services on Tuesday last. These services will be continued for about two months, at the expiration of which Messrs. Croggon's contract provides for the removal of the building.

Public Buildings in Serbia.—The independence of Serbia in 1878 was followed by an important development of activity in building and engineering operations. The railway system is being gradually developed, under the direction of German technical authorities, and the prospects of the future are good as regards the general prosperity of the country. The want of building material in the land itself and the inefficient methods of transport have done much to restrict building activity in the past. There is a great lack of public buildings in Serbia, and the following are projected, according to a statement made by Herr Wallbrecht at a recent meeting of the Hanover Architects' Society:—1. Buildings for the Ministry of War and the Ministry of Public Works at Belgrade (architect, Herr Wallbrecht). 2. Episcopal residence, with chapel, for Negotin, Nisch, and Karanowatz (architect, Herr Stier). 3. Gymnasium at Belgrade and Nisch (architect, Herr Wallbrecht). 4. Theological Seminary for Belgrade (architects, Schreiber and Schreiber, of Cologne). 5. Teachers' Seminary at Belgrade (architect, Herr Lingemann). 6. Lower Gymnasium at Belgrade (architect, Herr Stier).

A New Pulley Friction Brake.—We have received from Messrs. A. Bell & Co., of Manchester, a description of their new brake for forming an effective check on pulley ropes. It consists of a couple of blocks grooved for the number of ropes in the sheaf, so as to grasp all the ropes equally, and tightened or slackened by a cord acting on an auxiliary pulley attached to the brake. It can be applied to any rope block, and seems both simple and effective.

Surveyorship of Highways, Islington.—An appointment has been made to the above office. The candidates were ninety-three in number, and the choice fell upon Mr. J. P. Barber, assistant surveyor to the parish of St. George, Hanover-square.

The Association of Municipal and Sanitary Engineers (Home Counties District) met on Saturday at Ealing. Over forty towns were represented. There were also a considerable number of visitors interested in sanitary matters present. The members assembled at the Local Board office, and afterwards adjourned to the Lyric Hall, when the president, Mr. W. H. White, took the chair. A paper was read by Mr. J. Allen Brown, F.G.S., &c., entitled "A Sketch of the Geology of Ealing, with Evidences of Glacial Deposit," illustrated by some valuable drawings. A second paper was by Mr. Charles Jones, C.E., Engineer to the Ealing Local Board and past president of the Association, entitled "Twenty Years' Development of a London Suburb," which gave an account of the remarkable growth of Ealing. The sewage works were the earliest carried out in the Thames valley. They consist of a sewage farm for the northern district, and precipitating works for the southern district; and upon these latter works all house refuse, together with the sewage, is destroyed (cremated) by the aid of the "Destructor." This apparatus is a most valuable adjunct to the works, and is the first erected in the South of England. The increase in the "village" has been from 5,000, in 1861, to 18,000 persons now, and the rateable value of property has risen correspondingly from 21,500, to 118,071. The influence of the progress made in the sanitary arrangements is well indicated by the diminished death-rates, which have decreased from 18.26, in 1875, to 11.23 per thousand in the past year, the average for the past four years being 12.9. The members subsequently visited the sewage works, and were much interested in the mode in which the engineer treats the sewage mixed with the refuse, Mr. Jones explaining the various subjects of interest upon the works. A visit was then paid to the lately-constructed Brentford works and those at Chiswick. The members lunched at the Lyric Hall. Mr. John Thornhill Harrison, C.E., of the Local Government Board, and Dr. Clark, Medical Officer of Health, Twickenham, were amongst the visitors.

Sawdust Plastering.—Two Western inventors have recently obtained patents for the use of sawdust instead of sand in plastering compositions, and this, it is conceived, may be a matter of considerable importance to the owners of sawmills in the principal lumbering towns. One of the patents is for the use of nearly equal parts of plaster of Paris or cement and sawdust, with the ordinary amount of plastering hair and water; the other calls for the use of about 4 lb. each of slaked lime and sawdust to 1 lb. of plaster of Paris, a quarter of a pound of glue, and a sixteenth of a pound of glycerine, with plasterer's hair. Whether or not either of these described plasters would be cheaper than those made in the ordinary way, it would certainly be lighter, and it is believed that it would better adhere to the walls, and not be so liable to chip, scale, and crack. Sifted sawdust has before been used to some extent by experienced workmen for mixing with mortar for plastering external walls, exposed to the alternate action of water and frost, as a preventive of scaling. Certainly the experiment of introducing sawdust in place of sand in mortar is worth trying, for in many places sharp sand suitable for the purpose is difficult to obtain.—*Scientific American.*

Exhibition of Goldsmiths' Work.—We extract the following from the *Journal of the Society of Arts*:—"Information has been received from the Foreign Office, through the Science and Art Department, that an International Exhibition of Gold and Silver Smiths' Work, Jewellery, and Bronzes, will be held at Nuremberg in the summer of next year. The exhibition will be held under the patronage of H.M. the King of Bavaria, in the Bavarian Museum of Industrial Art of Nuremberg, from 15th June to 30th September, 1885. Steps have been taken to insure the admission, free of duty, of objects sent for exhibition, and for the return duty free of objects which remain unsold. Measures will also be taken with a view of obtaining a reduction in the carriage of objects sent for exhibition. Applications for space and all communications should be addressed, 'Bayrisches Gewerbe Museum, Nuremberg.'"

Alliance Bank, Regent-Street.—In reference to this building, illustrated in our last, Messrs. Dreyfus & Co. request us to mention that the basement was dried by them by "Ligny's Patent" process.

Steven's Architectural and Sanitary Castings.—We have received from Messrs. Steven Bros., of Glasgow and London, their large and handsomely bound catalogue of castings, plain and ornamental, of ironwork in connection with buildings, including gutters, spouts, ridgings, bathend and lavatory appliances, &c. The practical work appears admirable, and the catalogue very thorough; it is only when it becomes "ornamental" that we take exception to it. Cast-iron is a material repellent to the artistic mind in any case, but it may be treated artistically in a special style. The eminent northern ironfounders seem to have generally no perception of how to do this, however; their practical work is capital, their designs are commonplace. There is another Glasgow firm that sends out very large catalogues crammed with scores of pages of so-called "ornamental" cast work. If such firms knew how the architect who is worth the name looks on this portion of their catalogues, they would in their own interests cut all the ornamental work out, and confine themselves to giving practical details. In other respects the catalogue is a very well-arranged illustrated résumé of practical work, by a firm which has had a remarkably continuous and increasing success, and which has been able to make its best hands permanently interested in and proud of contributing to the success of the establishment. The *British Trade Journal* of last month gives an interesting account of the great workshops where the work here catalogued is carried out.

Utilising Niagara Falls.—It is now nearly two years ago that the question of utilising the water power of Niagara for generating electricity was first raised, the promoter being Mr. or Colonel Leonard Henkle, of New York. There seems to be at last some probability that his scheme will be carried out. The inventor proposes to transmit electricity for lighting purposes to sixty-five cities in the United States, from central batteries stationed at Niagara Falls, and driven by the immense water power there. The power generated will be transmitted through a silver wire about the size of a straw, laid underground, enclosed in heavy pipes made of asphalt. Such a wire can, it is stated, with a 40-foot battery at the Niagara Falls end, transmit in four hours to Rochester enough electricity to light that city for twelve hours. The sixty-five cities are all over 30,000 population. Lockport and Buffalo will probably be the first places where the inventor will introduce his apparatus as experimental points, and he hopes that he will be able to make those experiments next autumn. He expects to overcome the resistance usually found in transmitting currents through long distances by a properly-constructed means for the conservation of electric energy.—*Iron.*

Value of Property in Sydney.—From recent official statistics we learn that the number of properties in Sydney, exclusive of the suburbs, paying city rates, is 21,271; the total value of the rateable property being estimated at 36,772,840*l.*, and the annual rateable value of the same being 1,638,642*l.*

TENDERS.

For building the King's Arms, Acton, for Messrs. Fuller, Smith, & Turner, Chiswick. Mr. George More, surveyor:—

T. P. Herman	£3,799 0 0
Adams & Son	3,350 0 0
S. Hunt	3,210 0 0
J. R. Lambie	3,193 0 0
T. Fyfe (accepted)	2,925 0 0

For alterations and additions to Serivington House, Upperton-road, Eastbourne, for Colonel J. Sprot. Mr. A. Mardon Mowbray, architect, Eastbourne:—

J. Russell, Eastbourne	£340 0 0
G. Fowler, Eastbourne	330 0 0
A. Dore & Sons (accepted)	328 0 0

For the erection of a lecture-room at the Sturton Town-hall, Cambridge. Mr. Henry George Bishop, architect, Cambridge:—

Kerridge & Shaw	£236 0 0
P. Banyard	448 0 0
J. W. Apporpe	444 0 0
Faulkner Bros.	423 0 0
M. Yarrow	410 0 0

[All of Cambridge.]

For the erection of a Bake-office in Sturton-street, Cambridge, for Mr. John Burford. Mr. Henry George Bishop, architect, Cambridge:—

E. Parcell (accepted)	£240 0 0
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[No other tenders.]

For the erection of gamekeeper's lodge and shooting-box on the Horeham Hunt Estate, Sussex. Mr. H. Percy Monckton, architect, 36, Great James-street, Bedford-row, W. C.:—

D. Ashdown, Horeham-road*	£280 0 0
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* Accepted.

For proposed new vicarage, Ogbourne St. George, near Marlborough, Wilt., for the Rev. A. Pyne. Mr. C. E. Pouting, architect, Diocesan surveyor, Marlborough:—

Wall & Hook, Brimscombe	£2,000 0 0
Smith & Light, Chippenham	1,500 0 0
Stephens & Bastow, Bristol	1,450 0 0
B. Hillier, Marlborough	1,410 0 0
H. Hoskings, Hungerford	1,322 0 0
C. J. Phillips, Swindon	1,330 0 0
S. Elliott, Newbury	1,322 0 0

For additions to Crumlin Hall, Newport, Monmouthshire, for Mr. P. Phillips. Mr. E. A. Lansdowne, architect:—

W. Blackburne, Newport	£2,075 0 0
Jones & Sons, Newport	1,978 0 0
Moulton & Branscombe, Newport	1,950 0 0
J. Linton, Newport	1,945 0 0
H. Parfitt, Pontnewydd	1,745 0 0

For taking down the present Westgate Hotel at Newport, Monmouthshire, and erecting new hotel, shops, and restaurant, for the Westgate Hotel Company, Limited. Mr. E. A. Lansdowne, architect:—

John Linton (accepted)	£15,300 0 0
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For alterations at The Crosby Head, Old-street, St. Luke's, for Mr. Osborn. Mr. H. J. Newton, architect, 17, Queen Anne's-gate, S.W.:—

Royal	£378 0 0
Steel Bros.	245 0 0
Lambie (accepted)	243 0 0

Peculiar Work.

Burley	£42 10 0
Hellings	34 0 0
Heath (accepted)	33 0 0

For the construction of road sewers, &c., at Neaden, for the Metropolitan Railway Company. Mr. Walter Graves, surveyor:—

W. Maxwell (accepted)	£1,083 1 10
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For building three shops and two houses, Eastgate, and Balgate, Lincoln, for the Lincoln Finance Company, Limited. Mr. William Mortimer, architect. Quantities supplied:—

Harrison & Sands	£925 0 0
W. Wright Sims	834 14 6
Martin & Sims	818 0 0
Otter & Brougham	769 10 0
J. M. Harrison	779 10 0
Close & Co. (accepted)	769 10 0

* Without plate-glass.

For structural alterations and extensions to the Lincoln Gas Works at Bracebridge, Lincoln. Messrs. Stevenson & Son, engineers:—

Morgan	£6,064 4 8½
Close & Co.	6,499 15 0
Crosby & Sons	6,395 1 0
Otter & Broughton	6,379 0 0
W. Wright (accepted conditionally)	6,355 0 0

For the extension of the Yarborough-road, Lincoln, for the Lincoln Local Board. Mr. MacBriar, surveyor:—

The highest of seven tenders	£2,450 0 0
Close & Co.'s tender (the lowest)	1,730 0 0

For the erection at the Hull General Infirmary of an additional wing to the main building and a new out-patient's department in Brook-street. Messrs. H. Saxon Snell & Son, 22, Southampton-buildings, London, architects:—

Jackson & Son, Hull (accepted)	£11,800 0 0
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For stables, Buller's Wood, Chislehurst, for Mr. J. Sanderson. Mr. E. Newton, architect:—

T. Crossley	£1,240 0 0
Maiden & Harper	1,114 0 0
J. C. Arnold & Son (accepted)	1,095 0 0

For new organ chamber, Trinity Church, High Wycombe. Mr. Arthur Vernon, architect:—

Hunt	£189 0 0
Gibson	184 0 0
Harris	162 0 0
Looseley (accepted)	147 15 0

For building warehouse in Prebend-street, Islington, for Mr. L. Jacobs. Mr. Rowland Plambe, architect:—

C. P. Mills	£1,810 0 0
Lidstone & Son	1,638 0 0
Ebbage	1,480 0 0
Deering & Son	1,475 0 0

For the erection of St. Lawrence Church, Bristol. Mr. John Bevan, architect, Bristol:—

Howell & Son	£4,110 ..	£4,730
E. & T. Hatherly	3,967 ..	4,694
King & Son	4,301 ..	4,693
Stephens & Bastow	4,161 ..	4,540
W. Church	3,775 ..	4,394
Cowlin & Son	3,460 ..	4,000
James Wilkins	3,465 ..	3,991
Street, St. Paul's, Bristol* ..	3,200 ..	3,790

A. Exclusive of upper portion of tower and spire.

B. Inclusive of upper portion of tower and spire.

* Accepted.

For detached house at Enfield, for Mr. C. E. Jackson. Mr. Hamilton, architect:—

Harris & Wardrop	£1,194 ..	£288
H. Harper, Tottenham	1,088 ..	95
F. Harvey, Shepherd's Bush	1,084 ..	70
H. Bayler, Enfield	985 ..	88
Staines & Son	948 ..	88

For new roads and sewers on the Standard Freehold Land Company's Estate at Enfield. Mr. H. Wright, surveyor:—

Per Foot	£0 14 8
Pavey	0 12 16½
Nicholls	0 12 4
Woodman & Fry	0 12 0
Adams, Hackney (accepted)	0 12 0

For extension of ballast bank, Portmadoe Harbour, Mr. Thomas Roberts, Assoc.-M. Inst. C.E., engineer, Portmadoe:—

David Jones	£328 0 0
Hugh Hughes	2,781 0 0
Samuel P. Owen	272 0 0
William Jones	255 0 0
William Davies (accepted)	260 0 0
Engineer's estimate	265 0 0

[All of Portmadoe.]

For the erection of a new Baptist Chapel in Christchurch-road, Worthing. Mr. Rosta W. Moore, architect:—

J. Blaker, Worthing	£2,798 0 0
R. Blaker, Worthing	2,781 0 0
W. Stanbridge, Broadwater	2,783 0 0
Snevin & Son, Worthing	2,756 0 0
W. W. Smith, Worthing	2,637 0 0
S. Wood, Weybridge	2,607 0 0
P. Peters, Horham	2,435 0 0
W. H. Sawle, Worthing (accepted)	2,419 5 11

For the restoration of the Church of St. Helen, Cliffe-at-Hoo, Rochester, Kent. Messrs. Romaine-Walker & Tanner, archt. ets. Quantities not supplied:—

Tanner, architect.	Quantities not supplied:—		
	Chancel.	Nave.	Other Work.
Thos. Blake, Gravesend	£930	£350	£1,013
J. G. Naylor & Son, Rochester	893	285	918
	Messrs. Naylor accepted		

Messrs. Naylor accepted.

For new front to 51, Waterloo-street, Hove. Mr. Arthur Loader, architect, Brighton:—

W. Taylor, Brighton (accepted)	£127 0 0
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For alterations to shops, Nos. 21 and 22, Church-road, Hove. Mr. Arthur Loader, architect:—

J. Barnes	£207 0 0
Lyons	168 0 0
J. Bruton	166 0 0
Newham, Brighton (accepted)	154 0 0

For villa residence at Lancing, Sussex. Mr. Arthur Loader, architect:—

W. Shierlock, Lancing (accepted)	650 0 0
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For alterations to the Theatre and Bazaar Hall, Shoreham, Sussex. Mr. Arthur Loader, architect:—

W. Gates	£280 0 0
Burfoot, Shoreham (accepted)	693 0 0

For oriel windows, &c., to "Belmont," Hursley-point, Sussex. Mr. Arthur Loader, architect:—

S. Norman, Burgess Hill (accepted)	£465 0 0
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For new shop-front, &c., 20, Western-road, Hove. Mr. Arthur Loader, architect:—

John Bruton, Brighton (accepted)	£150 0 0
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For alterations, &c., at 17, York-road, Hove. Mr. Arthur Loader, architect:—

H. Bartlett, Brighton (accepted)	£196 0 0
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For alterations at No. 20, Russell-square, Brighton. Mr. Arthur Loader, architect:—

H. Bartlett, Brighton (accepted)	£140 0 0
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For alterations and repairs to five cottages, Norfolk-street, Brighton. Mr. Arthur Loader, architect:—

W. Hackman	£190 0 0
J. Barnes	167 0 0
G. R. Lockyer	169 0 0
J. M. Newham, Brighton (accepted)	161 0 0

For the erection of two warehouses in Cannon-street, and alterations to 4, 5, and 6, Watling-street, for Messrs. Spencer, Wicks, & Co. Mr. George Edwards, architect, 68, Brompton-road. Quantities by Mr. H. Lovegrove:—

Wicks	£500 0 0
Candler	5,500 0 0
Brass	5,483 0 0
Outwater & Son	5,340 0 0
Sahey & Son	5,340 0 0
Higgs & Hill	5,280 0 0
Nightingale	5,243 0 0
Stimpson & Co.	5,158 0 0
Woodward	5,150 0 0
Chappell	5,098 0 0
Green	4,875 0 0
Reading	4,778 0 0
Scharien & Williams	4,775 0 0
Martin, Wells, & Co. (accepted)	4,400 0 0

For alterations to 204, Oxford-street, for Mr. W. P. Stockbridge. Mr. George Edwards, architect:—

Stimpson & Co.	£373 0 0
Building, Fitting and Furnishing Co.	285 0 0
Scharien & Williams	282 0 0
Salter (accepted)	163 5 0

For alterations to 71, Southampton-road, for Mr. G. Edmonds. Mr. George Edwards, architect:—

Green	£290 0 0
Parkinson & Son	214 0 0
Patman & Fotheringham	193 0 0
King	180 0 0
Reading	169 0 0
Scharien & Williams (accepted)	140 0 0

For the completion of two houses at Shortlands, Kent, for Mr. Buckland:—

Stearat, Walworth	£176 10 0
Reed, Holloway	150 0 0
Rendle, Battersea	144 0 0
Wood, Peckham	142 0 0
Sugden, Kennington	121 0 0
Cole, Kilburn (accepted)	91 0 0

Accepted for painting and repairs to Hale Lodge at Elstree, Herts, for Mr. J. T. Unwin:—

W. Freeman	£91 0 0
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[No competition.]

For alterations at 94, Lever-street, St. Luke's, for Mr. J. S. Strensey:—

Davis	£121 10 0
Staines & Son	118 10 0

For the erection of additional buildings and work-shops at the Greenwich Union, Mr. W. Wallen, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Friestley & Gurney	£17,812 0 0
Mowlem & Co.	17,119 0 0
Jackson & Todd	16,619 0 0
W. & F. Croaker	16,620 0 0
Shaw	16,610 0 0
Jerrard	16,049 0 0
Martin, Wells, & Co.	16,000 0 0
Kirk & Randall	15,943 0 0
Nightingale	15,743 0 0
Humphries	15,683 0 0
Hart	15,498 0 0
Tongue	14,940 0 0
H. L. Holloway (accepted) ..	14,569 0 0

For painting, whitewashing, cleansing, &c., at the Infirmary in the Fulham-road, for the Guardians of the Poor of the St. George's Union, Hanover-square. Mr. H. Saxon Snell, architect, 23, Southampton-buildings:—

Dorrell & Co.	£375 0 0
Traies & Son	249 8 0
T. Jenkins	235 0 0
M. McCarthy	220 0 0
E. Coombe & Sons	220 0 0
F. F. Barrett & Sons	216 0 0
Wilkins & Kent	205 0 0
Vigor & Co.	195 0 0
Smith & Saunders	182 8 0
Fredk. Stevenson	159 15 0
A. Scott	157 0 0
M. & M. Fleming (accepted) ..	150 0 0
W. H. Bodin	139 10 0

For alterations and additions to the Branch School, Marlford Lodge, Hammersmith, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities supplied:—

W. Knight	£3,681 2 8
Felham Bros.	2,933 0 0
F. Higgs	2,800 0 0
R. M. Priestley	2,791 0 0
D. D. & A. Brown	2,776 0 0
W. Martin	2,770 0 0
Priestley & Gurney	2,725 0 0
J. L. Bryant	2,718 0 0
Gibben & Son	2,700 0 0
C. Lyford	2,679 6 8
Jos. Dorey	2,600 0 0
Magee & Co.	2,595 0 0
R. J. Humphreys	2,587 0 0
John Garrud	2,569 0 0
H. Haynes, Alpertown, Harrow* ..	2,404 15 6

* Accepted.

For painting and other works at the Poplar and Stepney Sick Asylum, Bromley-by-Bow, for the Managers. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities not supplied:—

Robson	£1,249 0 0
Proctor	1,150 0 0
Gibben & Son	1,135 0 0
Wythe	1,135 0 0
Bothman & Son	1,085 0 0
Derby	1,031 0 0
McCarthy	1,025 0 0
Fleming	985 0 0
F. Stevenson, 24, Fairfax-road* ..	895 0 0

* Accepted.

For repairing, painting, re-taping, &c., the whole of the Venetian blinds of the Poplar and Stepney Sick Asylum, Bromley-by-Bow, for the Managers. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities not supplied:—

Riddle	315 0 0
Atkinson	198 0 0
Haskins	191 12 0
Fuller Bros	176 0 0
Goddard	166 0 0
Williams & Son	165 0 0
G. Simpson & Co., 78, High-street, Whitechapel (accepted) ..	159 0 0

For building the new "King's Arms," East Acton, Middlesex, for Messrs. Fuller, Smith, & Turner, Griffin Brewery, Chiswick. Mr. George More, architect, 267, Rombold-road, Forest Gate:—

Harmer	£3,799 0 0
Adams	3,250 0 0
Hunt	3,210 0 0
Lamble	3,183 0 0
Nye	2,925 0 0

For rebuilding the Gresham Hall (including porch), Gresham-road, for the Company. Mr. Thos. Goodchild, architect, 6, Duke-street, Adelphi. Quantities by Mr. J. W. Stevens, 1, Dyer's Buildings, Holborn:—

Whithead	£4,775 Dec. 25th.
Maxwell Bros.	2,643
Fox & Palmer	2,637 Sept. 16.
Hall & Co.	2,594 Aug. 15.
Pack Bros.	2,518 Sept. 29.
Hobson	2,496
Scrivenor & Co.	2,427 To be arranged.
Holliday & Co.	2,389 Sept. 25.
Higgs	2,389 Sept. 1.
Macey & Cooper	2,347
Ansell	2,333 Sept. 30.
Jas. Smith	2,327 Sept. 20.
Fish & Co.	2,192 Three months.

For shop-front and interior fittings, 83, Gracechurch-street. Messrs. S. & W. Stone, architects:—

The Building, Fitting, and Furnishing Co., Limited (Thos. Hogben & Co.)*	£309 0 0
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* Accepted.

For three shop-fronts, Elizabeth-terrace, Upper Holloway, for Mr. F. Hornby:—

The Building, Fitting, and Furnishing Co., Limited (Thos. Hogben & Co.)*	£340 0 0
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* Accepted.

For alterations and fittings to Shaftesbury Hall, Aldersgate-street, for the Trustees of the Shaftesbury Chapel:—

The Building, Fitting, and Furnishing Co., Limited (Thos. Hogben & Co.)*	£152 0 0
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* Accepted.

For air-tight wall-cases and fittings, for Mr. F. C. Burton, Parker-street, Liverpool:—

The Building, Fitting, and Furnishing Co., Limited (Thos. Hogben & Co.)*	£131 0 0
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* Accepted.

Ambulance Station, Hornorton.—In the list of tenders for this work published on p. 707, for "H. & A. Brown," 9, 97/1, read "D. D. & A. Brown."

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

G. H. (we cannot enter into the matters you write about).—H. & A. drawing received.—J. & B. & Co. Paris (book received).—H. R. Frankfurt-on-Maine.—J. S. G. (under consideration).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of fact, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

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"THE BUILDER" is supplied direct from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum. Prepaid. To countries within the Postal Union, 28s. per annum. Remittances payable to DOUGLAS FOURDRINER, Publisher, 46, Catherine-street, W.C.

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Doubling Stone, Of the very best

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No. 3. MAY 31, 1884.

THE AQUE SULIS OF BATH.

BEFORE proceeding to notice the exhibits in Class XXXI., Baths, Wash-houses, &c., which will be found displayed for the most part in the East Central Gallery (C), we may fittingly describe the very interesting contribution sent to the Exhibition by the Corporation of Bath, and which will be found in the South Central Gallery amongst the completely-fitted apartments.

The thermal waters of the beautiful city of Bath have undoubtedly a right to admission in any exhibition relating to the subject of health. The remote antiquity of its hot baths, their unsullied reputation for curative properties, the long-continued fashionable character of its pump-room, and the medicinal qualities attributed to its mineral waters, as well as the curious legends attaching to the discovery of its ever-flowing thermal springs, dating back to nigh upon two thousand years ago, combine in giving an interest of no usual kind.

The view of its many streets of white stone houses, mounting up the slopes of the steep hills rising 600 ft. or 700 ft. from the lovely valley of the Avon, is a sight once seen never forgotten. All that is lovely, healthful, and attractive may be said to be concentrated there. To the builder its fine white freestone has been a material of the utmost value, and has been almost universally employed for realising in the erected fabrics of our churches and public edifices the highest conceptions of architects of Medieval and modern times, almost since sculptured ornamentation in mouldings and traceries was first conceived. The Corporation of the City, thoroughly imbued with a proper estimation of the value of their remarkable natural springs and of the wonderful antiquities with which they are associated, as well as duly appreciating the benefits accruing to the town from them in riches, and to the thousands of patients in relief for various ailments, have contributed an exhibit which is thoroughly worthy of the occasion and of the ancient and present fame of Bath. In a very large model, on a scale of 4 in. to 5 ft. singularly well executed, there are shown superposed or exposed, in due relation to each other, the modern Baths, Pump-room, and Hotel, and the antique Roman baths and hypocausts already exhumed to more than double the extent of the modern buildings. The present Pump-room, we may say,—for the benefit of those of our readers who are not acquainted with Bath and its institutions,—is 83 ft. in length by 68 ft. in width and 44 ft. in height, with a façade relieved by Corinthian columns and having a colonnade on each side. It is used as an assembly-room for subscribers and visitors, where the medicinal waters are drunk, and in which the bathers from the hot baths remain for a time before going into the open air. Adjoining the Pump-room are the King and Queen Baths, consisting of a series of bathing-rooms around a central circular bath. In the angle of junction between these edifices there jut out another large bath known as the King's Bath,—the most interesting of all the baths, as being over the site of those ancient springs, the discovery of which tradition assigns to King Bladud, who, whilst a leper and an outcast, finding his pigs, to which he had communicated his loathsome disease, cured by wallowing in the hot mud deposited by them, successfully applied the same natural remedy to himself. These springs,—which rise at a temperature of 117° Fahrenheit,—were enclosed by the Romans in a leaden basin, which again was surrounded by a large octagonal masonry well, 50 ft. in diameter, and lined over

its interior walls with sheet-lead. Some twenty or thirty tons of this have, at a recent period, been taken away and sold,—the lead being rich in silver,—and the funds applied to the excavations. These Roman antiquities still remain under the floor of the King's Bath, which has been built over them on arches; the waters from the springs now flow over a breastwork, rising about 5 ft. or 6 ft. above the modern floor and running from it into the surrounding bath. Adjoining the King's Bath is the Queen's Bath, of the same date as the former. Under the Queen's Bath is another Roman bath of more than corresponding extent; and in line with this is the great Roman bath, 83 ft. 8 in. in length by 40 ft. 2 in. in width, rectangular in form, with stone steps descending on every side into the water, which, in the Roman days, rose to 5 ft. 10 in. above its floor. The hot water from the springs flowed into this magnificent pool, along the sides of which were twelve massive masonry piers, six on each hand, of rectangular section and noble proportions. All round the bath was a wide platform or pavement, and in the surrounding walls were two rectangular and four semicircular recesses, the total dimensions of the edifice being 111 ft. 4 in. by 68 ft. 6 in. Beyond this great bath again was yet another fine bath of like dimensions, with the one at the opposite end beneath the Queen's Bath. These old Roman baths have been largely excavated, some portions being exposed to view, and some portions lying under the Kingston Buildings and the Poor Law Board's Offices, the underpinning of which is marked out in the model by lines of copper pins.

Still further eastward adjoining the bath last noted are the remains of large buildings with hypocausts below the ground-floors. That similar remains extend thence to the northward is known, as the south wall of the abbey church is built upon the north wall of yet another large Roman bath. The excavations are still proceeding, the scene of the present labours being in the opposite direction, namely, to the eastward of the Queen's Bath, where, in the vicinity of York-street, some most interesting discoveries are being made. The total area, explored and unexplored, over which there are evidences of the ancient Roman baths and their contiguous buildings, is no less than 300 ft. by 190 ft., giving a superficial area of 57,000 square feet. The quantity of water flowing naturally, and being pumped at the present time, is equal to 385,000 gallons daily; and as the natural supply still comes from the old Roman springs, it may be assumed that there has been no alteration whatever in the outflow. In another part of the City of Bath there is a celebrated cold spring, called "Winifred's Well," and the water from it is to-day, as it was in Roman times, conveyed to the Thermal Baths, and used for cooling the temperature of the unbearably-hot water from the thermal springs. In the old Roman great bath, the jets from the springs seem to have been sprayed into the bath, probably for the like purpose of reducing the temperature.

At the farther end of the model there is a representation of other modern baths attached to the Royal Bath Hotel, and which are admirably designed for the wants and requirements of patients. These baths and their adjoining rooms constitute one wing of the hotel, which is situated at the opposite side of the street to the Royal Baths themselves. The bathing-pool is designed chiefly for ladies, and is 80 ft. long by 25 ft. in breadth deepening gradually from 3 ft. 3 in. at one end to 5 ft. at the other. On each side are separate dressing-rooms, and at the ends are the general rooms. On an upper floor surrounding the Bath Hall are special rooms for invalids under special treatments; among these are provided reclining-baths, douche-baths, and chair-baths, in which

latter case the cripple or patient unable to walk can be craned into and out of the water. Nothing is left unprovided here for the comfort or convenience of the bathers.

Not only has the Corporation, under its learned and talented officer, Major C. E. Davis, F.S.A., the City architect,*—to whose energy and ability is due the successful prosecution of the excavations during the past ten years,—made grants in support of the work, but the Society of Antiquaries have helped in the work, and other aid rendered by public and private subscriptions,—contributed such a splendid model so conspicuous for the most interesting information it affords, but it has supplemented this by a valuable Museum of Roman antiquities and by a collection of photographs and paintings which in themselves afford a curious history of the baths from ancient to modern times. Amongst the portraits are those of Beau Nash, the conductor of the fashionable crowd of the last century, and of Dr. Oliver and Mr. Pierce, the physician and the surgeon, whose efforts and recommendations contributed so much to re-establish for the waters of Bath their ancient renown.

SANITARY FITTINGS.

CONTINUING our notice of the exhibits in Class XXIII., so far as they are to be found in the Eastern Annexe, we note that Messrs. R. F. Dale & Co. (Stand 516), of Bear-lane, Southwark, have a very satisfactory display of serviceable goods. Foremost amongst their exhibits we must name their speciality, the "European" side-outlet valve closet, which well merits the attention of visitors. It is claimed for it that it combines in one apparatus all the advantages of the flush-out and valve closets, avoiding their individual defects. The construction of the overflow is so arranged that it is not easy to conceive of its failing or becoming blocked. The outlet being central with the basin, this closet can be fixed in the place of an old Bramah or pan closet. The valve hinges backwards, so as to be clear of the discharges from the basin. The closet is made either with a galvanised iron trap and a pottery-basin, or with the trap and basin in one piece of glazed earthenware. The same exhibitors show in action a syphon water-waste preventer with instantaneous action; these cisterns give a good after-flush. For the "Southwark" ball-valve, shown by the same firm, the advantages claimed are that it runs full-stream until the cistern is nearly full, and that it has been tested to stand 300 ft. head of water. It has no cup-leathers and no stuffing-box, and it is further alleged in its favour that it cannot set fast.

Mr. James Robertshaw, of Manchester (Stand 517), shows Turner & Robertshaw's patent "Dividable" closet, or dry-pail system. By this invention it is sought to separate the liquid from the solid matter, whereby fermentation is prevented. The pail stands on a sanitary tile bottom, on the upper surface of which is a semicircular raised flange, which allows of the position of the pail being so adjusted that the hole in the bottom of the vessel comes exactly over the hole in the tile-bottom, in which there is a grid through which any liquid finding its way into and through the pail will pass into a syphon trap. But it is claimed that the pail is relieved of about fifty per cent. of liquid by means of a specially devised urine-guard of galvanised iron or earthenware, which deflects the

* We may perhaps be thanked by some of our readers for calling their attention to Major Davis's book entitled "The Baths of Bath's Aye in the Reign of Charles II.," which was reviewed by us in our last volume (see p. 304), and which contains a great deal of interesting information about the Baths. Some additional particulars of the Roman remains will be found in the *Builder* for Sept. 2, 1882, p. 319.

liquid and conducts it by a down-pipe directly into the syphon trap before mentioned. It is claimed that the solid contents of the pails can be readily emptied and dealt with or utilised without being subjected to any burning or drying process. Of course house-slops should not be thrown into these receptacles; but as a matter of fact they are often so disposed of, and in order that they may pass off readily into the drain, a perforated channel is formed at the side of the pail, in addition to the perforated false bottom with which the receptacle is provided. These closets are stated to have been used in Batley, Ashton-under-Lyne, Tunstall, and other towns, with good results.

Stand 518 is occupied by Mr. William Whiteley, Bayswater, who, desirous of worthily sustaining the rôle of "universal provider," has not lost sight of some of the means for making dwellings healthy. True it is that most of his exhibits are the manufactures of other firms, but they are good of their kind and bespeak soundness of judgment in their selection. None the less, however, will Mr. Whiteley's encroachment on the domain of plumbers and sanitary engineers be resented in some quarters. The mention of "sanitary engineers" leads us to point out, as we have done on previous occasions, that it is not every one who uses the title who can justly claim it. Too often it is merely "plumber"—and sometimes indifferent plumber,—writ large.

Mr. Thomas Waller, of Fish-street-hill (Stand 521) exhibits his patent ventilating arrangements for water-closets and urinals. A water-closet constructed on Mr. Waller's system has the casing-in so arranged that a current of air is always passing through it and across the top of the basin, so as to carry off any effluvia that may arise from the apparatus. The flap, or cover, is made to slope downwards, the exhibitor's theory being that it thus acts (when shut down) in the same manner as the "blower" to a fireplace. When the lid is shut down, an opening, leading into a ventilating shaft, is left at the back of the casing (above the level of the hole in the seat) so as to carry off any foul smell that may be given off from the basin. When the lid is raised it closes this opening. The urinals shown by the same exhibitor are ventilated by means of fresh-air inlets in the floor, and by the provision of louvred openings for extraction purposes above and below the basins.

Stand 522 is occupied by Mr. George Jennings, of Stangate, whose productions are among the best of their kind in the Exhibition. A useful apparatus, which we think we have mentioned on a previous occasion, is the lift-up closet for use in large establishments. This consists of a strong iron hopper and trap, enamelled inside, and fitted with a wooden seat so counterweighted that it flies up when released, leaving the hopper available for use as a urinal or slop-sink without discomfort to subsequent users of the closet. The iron hopper and its counterweighted seat constitute the whole of the apparatus, a strong flush of water being obtained every time the seat is raised or lowered. No casing or boxing-in is necessary, and the closet takes up little space. A new water-waste preventer for giving a good after-flush to water-closets was being fixed at the time of our visit. We have not seen this in action, but from what we hear of it it would seem to embody an improvement of great value. Some very good valve closets are shown at this stand, besides Jennings's cottage-valve "Monkey" closet, which is a "wash-out" closet, in all essentials the same as that introduced by the late Mr. Jennings a good many years ago, which was the precursor of many of the "wash-out" closets now in the market. Seat-action and door-action water-closets and urinals of different kinds, go to complete a very useful lot of exhibits.

Messrs. Shanks & Co., of Barrhead, near Glasgow (Stand 523), show some good water-closets, including a self-acting encased closet, of which the basin is encased in an outer covering of iron. This closet, which needs no timber casing, appears to be well adapted for use in large institutions. The flushing apparatus is actuated by the movement of the seat. Among other good closets shown by this firm, we may name the "Tubal," a "wash-out," with front outlet. But at the time of our visit the closets and other apparatus at this stand were very inadequately supplied with water.

Stand 524 is, as we stated a fortnight ago, occupied by the Manchester Corporation, with models and descriptions of the apparatus in

use for the disposal of refuse in that city. Some account of these will be found on p. 734, ante. A kindred exhibit, though of only one object, is made by the Mayor and Corporation of St. Helens, who show (525) a full-sized model of a pair of closets upon the pail-and-tub system, as in use in that borough.

Stand 526 is occupied by closets fitted with the apparatus of the Automatic Disinfecting Company, of Queen Victoria-street. This consists of a globular receiver, placed beneath the seat of the closet, and close to the basin, containing a disinfectant, some of which is injected into the water in the basin each time the closet is used. It is stated that the globular vessel when charged contains disinfecting material enough for 10,000 gallons of water. The disinfectants used appear to be two, viz., Condy's fluid or permanganate of potash, and a material known as "Anti-zymotic Crystals," which has a very agreeable perfume, though whether it is inimical to disease germs we will not undertake to say. No doubt apparatus of this kind is useful, and even essential, with bad forms of closet, but we are strongly of opinion,—an opinion to which we have given expression over and over again,—that closets which really need such "safeguarding" as is afforded by apparatus of the kind under notice should be discarded. On the other hand, it is obvious that in hot weather the use of a certain quantity of disinfectant mixed with the water which is to stand in the closet basin, is likely to be beneficial, but this can be said without losing sight of the principle that all water-closet apparatus should be self-cleansing and independent of such aids as those to which we are referring.

Mr. James Wood, of Bath (Stand 527), exhibits some portable commodes which are likely to be found very useful and effective. "Sanitas" and other disinfectants may be used, and the contents of the receptacles can be emptied without offence or exposure.

Stand 528 is occupied by Messrs. Wilcock & Co., of Burnmantofts, near Leeds, with their excellent automatic-flushing school latrines, closets, &c., to which we incidentally referred last week.

Nicholls's "patent sanitary and deodorising system" is shown by Mr. Richard Nicholls at Stand 529. The system is embodied in what is called the "Anthropos" closet, which is likely to be found useful in certain situations where no drainage system is available. It is claimed that this closet not only deodorises the excreta, but converts it into a rich though dry and sweet manure. No. 1 closet is made of cast-iron, with mahogany top and back shield, and weighs about 90 lbs. complete, with copper carbon box and atmospheric deodoriser. It contains when full about 20 gallons. With fire-place complete, it can be used for consuming the contents of the dust-bin, or any vegetable matter, as well as for converting the faeces into manure. No. 2 closet consists of a copper-pan, 2 ft. by 1 ft. 6 in., containing 20 gallons, and weighing about 26 lbs. when empty. It is made with a flange, on which it rests when dropped into the "baking apparatus," so as to remain suspended over the fire. We do not remember to have seen this invention before, and have no information as to its practical results, whatever they may be.

Messrs. Dent & Hellyer (Stand 530), of New-castle-street, Strand, have a very good and varied display of sanitary fittings and appliances, all of them of great excellence. Their patent "Optimus" valve closet as now made includes several improvements, one of them consisting in making the overflow of the basin to discharge into the vent-arm of the valve box, well above the line of the discharges through the closet, so as to prevent the fouling of the overflow trap by the entry of "back-wash," while at the same time the discharging end of the trapped overflow is open to the atmosphere through a vent-pipe. The overflow holes, as hitherto made in the basin, are abolished, and the entrance to the overflow is made direct from the top of the basin, whilst, to ensure a thorough washing of the overflow the flushing-rim is continued from the basin round the overflow arm. This closet is made with an earthenware slop-top and a lifting seat, so as to allow of its use as a urinal or slop-sink. Another speciality shown by these exhibitors is Hellyer's patent "Hygienic" or "Artisan" closet, than which nothing can be simpler or better, of its kind. The shape of the basin and the

arrangement of the flush are such as to ensure perfect cleanliness. This closet is also made with an earthenware slop-top. A housemaid's slop-sink, made of iron and enamelled inside, is worth attention. It is made to fit an angle, and is provided with draw-off taps for hot and cold water and with a very effective flushing or rinsing apparatus for cleansing every part of the interior surface of the sink every time it is used. Given a fair supply of water and a careful and cleanly housemaid, it would appear to be impossible for any part of this sink to become foul by the accumulation of flocculent matter. A hospital slop-sink in white earthenware is also shown at this stand, besides other useful sanitary appliances, including Hellyer's patent "Ventilating drain-syphon and sewer-interceptor," which affords a simple and effective means of disconnecting the house-drains from the sewer. A "soil-pipe disconnector," constructed on the same principle, is specially made for disconnecting soil-pipes from drains; also a "waste-receiver," for intercepting waste-pipes from the drains. Hellyer's "drain-sentinel," with inspection shaft; stone-ware "rain-water shoes" and air shafts for drains; Hellyer's grease intercepting tank (very simple and effective); the "Wigmore-street" grease-trap (specially constructed for bodily removal for periodical cleansing); some cast lead traps of good section and self-cleansing; and some sections of old D-traps which serve to show the capabilities of this form of trap as depositories of filth, go to make up a very useful and instructive list of exhibits.

Stand 531 is occupied by Messrs. T. & W. Farniloe, of Westminster, who have a good assortment of plumbers' brasswork and water fittings. Their "Simplex" valve closet is provided with a "weeping-pipe" from supply to overflow arm, by which means water is passed into the overflow trap each time the basin is charged with water. Another speciality at this stand is the "Westminster" valveless syphon water waste preventer, which is one of the best appliances of its kind, being exceedingly simple in principle. This cistern is now made in cast iron, and provided with galvanised iron or copper fittings.

Messrs. Henry Owen, & Co. (Stand 532), of Croydon and Kensington, exhibit a number of their patent ventilating sanitary appliances, one of which is their valve closet No. 3. In this the basin and trap are combined, standing clear of the floor. The outlet from the basin is at the front, while the discharge from the trap is at the back, having at its highest point a ventilating pipe taken through to the open air, thus preventing the possibility of syphonage. The water is retained in and discharged from the basin by means of a vertical valve working upon a centre above the water-line, and by which means the valve is thrown clear of all deposit upon the handle being raised for discharging the contents of the basin. Other closets made by Mr. Owen are provided with means for ventilating both basin and trap. A very useful article for many situations is Owen's patent lavatory, slop-sink, and trapped urinal combined.

Stand 533 is occupied by Mr. William Smeaton, of Drury-court, Strand, who shows, besides water-closets and other fittings, some good plumbers' work.

We must reserve for a third notice the remainder of the exhibits in Class XXIII.

MACHINERY IN MOTION.

THERE is a very fair show of machinery in motion in the Exhibition, some of the displays being remarkably complete. The great fault about the collection, taken as a whole, is, that it is not a representative one, considering that the object of the Exhibition is the promotion of health. Nevertheless many of the exhibits among the machinery in motion, as will be seen from the following description, have an important bearing on the preservation of health, and this is especially the case with regard to the ventilating fans and other appliances suitable for use in the Dwelling, the School, or the Workshop.

The largest and most attractive stand in the Western Gallery (where the bulk of the machinery is placed) is that of Messrs. Allen & Sons, the well-known manufacturing confectioners, who show the whole process of making those articles generally known amongst children as "sweets." Their bearing on the health of the community is not very great, at least they

scarcely tend to produce good health, and Messrs. Allen & Sons can hardly intend their exhibit to act as a warning to youthful gourmands. Messrs. J. & J. Colman, the widely-advertised mustard-makers, are close by, and show a mustard-mill in operation. The process is simple in the extreme. The seed is first crushed between a pair of horizontal rollers, and thence is passed to a species of stamp-mill of the most primitive design. All that remains is to sift and pack the produce, which processes are carried out at the Exhibition. The stand occupies a good deal of space. Whether this is proportionate to the bearing of mustard on human health we need not stop to inquire, as the exhibit serves its purpose of creating a great deal of interest amongst the visitors. Mineral waters have a large space allotted to them, three firms each making a big display. Mr. J. Galloway, of Bolton, shows a soda-water machine, which will produce 60,000 bottles a day; in addition to which he has some smaller apparatus. He also exhibits filling-machines, gas generators, holders, and purifiers; syrup-boilers and other appliances used in the manufacture of aerated waters. Adjoining this stand, Messrs. Hayward Tyler & Co., of Whitecross-street, show a complete plant for the manufacture of aerated waters of various kinds, in which special attention has been paid to the best means of avoiding all forms of contamination. The machinery shown on this stand is noticeable for the excellence of its finish. Messrs. Barnett & Foster have the most important display of this class of machinery, comprising a factory for the manufacture of aerated drinks, which are made, bottled, and distributed daily in the ordinary way of trade. The output of this compact factory forms no inconsiderable item in the daily returns. The influence that aerated waters have on health, like that of sweetmeats and mustard, is not very great, but there is one feature shown on Messrs. Barnett & Foster's stand which undoubtedly brings it well within the scope of a Health Exhibition. This consists of a beer-aerating machine, by means of which light beers can be bottled and preserved in a sparkling condition. Proceeding to the opposite end of the western gallery, we find a large and important exhibit consisting of a number of laundry appliances shown by Messrs. Bradford & Co. These are both for domestic use and trade purposes. The exhibitors have paid special attention to the fitting of steam laundries. Washing-machines, centrifugal drying-machines, wringing-machines, drying-closets, disinfecting apparatus, and other appliances are shown. Next to this stand Messrs. Cleaver & Sons exhibit soap partly in process of manufacture, a stamping-machine being the most noticeable object. Close by, the Blackman Air Propeller Ventilating Company show four of their ventilating fans, the largest being 48 in. in diameter. This, it is said, will move 35,000 cubic feet of air per minute by means of 2 h.p. A small apartment is fitted up, which will be ventilated by a 48-in. propeller blowing air in, whilst a 36-in. propeller exhausts from the room. A 16-in. propeller discharges into the apartment through a distributing apparatus and is driven by an electro-motor through the current used for lighting the Exhibition, or by a galvanic battery. These fans appear to be well adapted, as we observed not long ago, for providing efficient means of ventilation to factories and workshops of all kinds. Messrs. Waygood & Co., of Great Dover-street, have some working examples of lifts and hoists, and also a model of a hydraulic-balanced passenger-lift. Some of their safety appliances are ingenious and effective; an automatic means of obtaining a reciprocating motion of a lift is also shown. Messrs. Beare, Goswell, & Co., of Southwark-street, exhibit Faulder's patent gas-heated coffee-roaster. Gas is said to offer many advantages over coke for the purposes of coffee roasting. The machines exhibited on this stand are easily placed and require no brick setting. A small centrifugal fan is used for forcing air in with the gas, so as to produce as nearly as possible perfect combustion. The machine shown is rotated by power, and is suitable for a shop or large establishment. Smaller machines, to work by hand, and better fitted for ordinary domestic use, are made. A means is provided for taking a sample of the roast whilst the machine is at work; a hollow scoop, like a cheese-taster, which forms the axis of the cylinder, can be withdrawn, and with it a certain quantity of the beans. The superiority

of freshly-roasted coffee over that which has been done some time is very great; the cost of sufficient gas to roast 1 cwt. of coffee is said to average 4d. per hour. Messrs. H. Aland & Son show fan-blowers and exhausters, one of large size, 3 ft. 6 in. in diameter, suitable for colliery purposes. Perhaps a more interesting feature is that of their portable hand or power ventilating-fans. These are mounted on an iron frame fitted with wheels in front, and two handles for pushing the whole along, much in the same way as a portable garden-watering machine. Some of the fans are double-g geared, and are worked by a rotary motion like an ordinary winch. For farm purposes they would be very useful, especially since the introduction of the method of ventilating hay-stacks by fans. Mr. James Howarth shows radial screw ventilators, and other appliances for ventilating purposes. Mr. George Seagrave exhibits a hot-wind generator and Stewart's high-pressure blower, in which two blades revolve within a cylinder at varying velocities and round a central shaft. The velocities are controlled by an eccentric crosshead acting upon crank arms outside the cylinder, and in this way the air drawn in at every revolution is again forced out. Messrs. Heyes, Lloyd, & Shuttleworth show several examples of wringers, mangles, washing machines, and other laundry appliances. Messrs. T. Harvey & Co. exhibit a process of soap-making suitable for domestic purposes. It consists of simply mixing together Greenbank's double-refined 98 percent. caustic soda (for which Messrs. Harvey & Co. are agents) and the surplus grease from the kitchen; and the soap is made. The exhibit is admitted into the machinery-in-motion department by virtue of a stamping apparatus used for putting the name on the cakes of soap. Mr. W. A. Gibbs, of Chingford, shows a large working model of a wheat-dryer. The apparatus consists of a brick casing in which a coke fire is made, by which air is heated and is then carried by a centrifugal fan into air-ducts travelling through a sloping revolving cylinder. The grain or other substance to be operated upon is fed into this cylinder by means of a hopper. The cylinder is lined with a number of cells. As it revolves the grain is poured out of these cells down a series of inclined planes formed by the air-ducts. In this way a gentle but continuous motion is obtained. Besides conditioning grain the machines have been used for drying tea, vegetables, cocoa, starch products, chemicals, &c. An especially large machine has lately been made for drying the apple-pulp which remains after cider-pressing. Messrs. H. Stopes & Co., of Southwark-street, exhibit Saladin's "Echenger," an apparatus used for cooling air on gas. A perforated metal cylinder is half immersed in a trough of water, and is then caused to revolve. Air is driven by a fan into the interior of the revolving-cylinder, and escaping through the wet-perforated walls is cooled more or less according to the temperature of the water. The dryness of the air supplied also affects the result, as heat is absorbed by any evaporation of moisture that takes place. Several of the perforated cylinders may be placed one inside another to increase the cooling surface on the apparatus. Another interesting exhibit on this stand is Schaffer's magnetic screen, which is used for extracting pieces of iron or steel from amongst wheat, malt, rice, barley, &c. Malt made from English barley often contains three nails to two quarters: since the introduction of mechanical thresh-binding small pieces of wire are constantly found amongst grain, and these get into the mills, and are often the source of considerable danger, to say nothing of the harm done to the flour by the finely-divided metallic particles. Thus the magnetic screen will arrest these seems evident from the samples of iron displayed, which had been obtained in ordinary work. Nails, bolts, nuts, screws, and even a 1 lb. iron weight are shown. The latter was secured by a screen working at Courage's Brewery. Several interesting mechanical appliances connected with clothing are shown. Messrs. Harry Anblot & Co.'s cloth-cutting machine will cut out several thicknesses of cloth or other material, the apparatus consists simply of a band-saw or a band straight-edged knife worked by power or hand. The saw, or, rather, serrated knife, is used for corduroy, moleskin, or other thick materials. Messrs. Podger & Davey's collar and cuff-ironing machine is shown at work. It is heated by steam or gas, and driven by power. The cost of heating by

gas is stated to be 2d. per day, and it is stated to be capable of turning out 180 doz. collars and cuffs per day. Messrs. Davey & Fabian also show a mechanical ironing machine at work. This is used for table-linen and large surfaces of that nature. The article to be operated upon is passed over a revolving-roller. The latter is covered by the concave under surface of the steam-heated iron, which has a short reciprocating motion parallel with the axis of the roller, and therefore normal to the travel of the latter. A compound movement is thus obtained, which is very effective in smoothing the cloth. We noticed this machine when shown at a former exhibition.

The motive power for all these machines is supplied by a large pair of W. & J. Galloway & Son's horizontal compound automatic expansion engines, fitted with a parabolic governor. The high-pressure cylinder is 14 in., and the low-pressure 24 in. in diameter; the stroke being 2 ft. 6 in. These engines do not work with a condenser, as there was found to be a difficulty in obtaining sufficient refrigerating water, so the exhaust is carried into the chimney-stack. The two Galloway boilers are placed in an adjoining building. They are 26 ft. long by 6 ft. 6 in. in diameter, and are suitable for working at 80 lb. pressure. They are made of steel throughout, both plates and rivets; the rivet-holes being drilled with the plates in position. These boilers are an excellent example of workmanship.

Besides the machinery in the West Gallery, there are several exhibits of the nature grouped in the neighbourhood. The chief of these are in the West Annex. Entering by the north door, and having passed the two large Galloway boilers already referred to, we notice one of G. T. Blundell & Co.'s large water-witch pumps mounted on wheels for transport. This is intended for farm or agricultural purposes, or it would make a very powerful fire-engine, supposing steam could be obtained for it. Adjoining this pump Christy & Co. show an artificial system of hatching and rearing fowls, the pretty yellow chicks, which seem to make their appearance every day, being curiously out of keeping with their very practical surroundings. The system shown is that introduced by Miss May Arnold, and is a development of the French method, which for many years was, and probably is now, successfully moved on a commercial scale. Hot water is used for supplying the necessary heat, so that a uniform temperature can be obtained. The eggs are cooled *in situ* by a flush of air, and the nest is at all times stationary. The large number of deformed chicks obtained by the old form of apparatus is attributed to the disturbance of the eggs in the process of hatching. Messrs. Christy's exhibit is a pretty and interesting one, but appears a little out of place in the Machinery-in-motion department.

The next stand is devoted to the partial illustration of candle-making, which is exhibited by Price's Patent Candle Company, who show at work a candle-moulding machine of what we believe is an entirely novel form.

Messrs. Siebe, Gorman & Co. show a dry-air refrigerator and an ice-making machine worked on the ether principle.

Mr. William Whiteley, the "Universal Provider," has on view a van for conveyance of provisions, which is fitted with an ingenious arrangement for working a ventilating fan direct from the wheels of the van. As it is not possible in the exhibition to actuate the machinery by means of its ordinary motive power, an attachment has been made to a small Bischoff gas engine, which works on to a temporary pulley placed outside.

The London Guelph Patent Cask Company have a large stand, on which special machinery used in cask-making is shown, beside examples of the casks made on their system. Lawrence & Co., Limited, show a good collection of capillary refrigerators for cooling milk. The action of this apparatus may be reversed, and it can be equally well used for heating purposes. In this way it is applied for concentrating syrups, juices, and such matters. The most interesting exhibit on this stand, however, is an ingenious machine by which ordinary fat can be globulated, so that it will become thoroughly incorporated with milk. With one of these machines skim milk can be enriched, the inventor says, so that it will produce excellent cheese. Those who are aware what hard tasteless stuff skim milk cheese is will appreciate the advantage of Mr. Lawrence's invention. Messrs. Hughes &

Lancaster, of Chester, show an example of Shone's pneumatic ejector. This is an apparatus by which an occasional flush of sewage is obtained in place of the sillage being allowed to flow gradually into the sewer, and so be likely to accumulate and create an obstruction. The ejector consists of an air-tight receiver into which the sewage gravitates, and by the filling of which a suitable mechanism is called into play to admit a charge of compressed air, and so force the sewage to any desirable height or distance, according to the pressure used. In the Exhibition an air-pump such as is used for the Westinghouse brake is employed to get the required pressure. The system was applied two years to the purpose of removing and carrying out to sea the sewage of Eastbourne. It is also in use in some other towns for removing sewage and other purposes. It is said to be very well adapted for lifting water in factories, mines, &c. In Worthing it has been applied for lifting sea-water to water the streets and flush the sewers. Shone's flush tank or hydraulic house-sewage ejector is also shown on this stand. It consists of a tank for the reception of all domestic waste liquids, and into which the discharge from the water-closet passes directly. From the bottom of the tank a pipe is led which passes upwards, and is bent over the side into a syphon, the long leg being connected with the house-drain. A tumbling basin placed above receives a stream of water from a special pipe, or is fed by the waste-water of lavatories or baths. When the tumbling basin is full it turns over automatically, and in doing so fills the syphon, which in turn will empty the tank on any sewage matter that may have collected in it. In this way it will be seen that a periodical flush is obtained in place of the feeble and attenuated stream from which so many evils arise. Suitable ventilating pipes are placed in the ejector, the communication between it and the sewer is trapped in the usual way.

Messrs. J. & E. Hall, of Dartford, and the Haslam Foundry, of Derby, both exhibit dry-air refrigerating machines in operation. The former firm has lately brought out a new form of apparatus in which a good many improvements may be noticed. The question of preserving food by refrigeration is, however, one which deserves more than a passing notice, and we hope to return to it at another time. The Machinery and Hardware Company have a small building adjoining the West Gallery. Here they show some machine tools, which, no doubt, possess the merit of cheapness. They have a small pair of compound condensing yacht engines of a pattern similar to those exhibited by J. Copley & Co., of Middlesbrough, at a recent machinery exhibition. A horizontal single cylinder engine, boilers, spacers, machine belting, the "Koh-i-noor" gas apparatus, pulleys, and various other objects complete this firm's exhibits.

No mention of the machinery in motion, however brief, should be made without referring to the Otto gas engines, supplied by Crossley Brothers, Limited, of Manchester. These engines are to be seen in all parts of the Exhibition where there is machinery to be set in motion,—in the bakeries, dairies, for pumping sea water into the aquarium, for electric lighting, and in many other situations. We recently had an opportunity of making a careful inspection of the new factory which this firm has erected at Openshaw, and the special tools there laid down expressly for making the Otto gas engine. We notice that one or two important improvements have been made since the last big display of these engines in the Fisheries Exhibition. Probably the most noticeable is the self-starting apparatus. This was a feature very much wanted in the gas engine until the Crossley and other appliances were lately introduced.

SCHOOL BUILDINGS AND ACCESSORIES.

CLASS XXXIV. of Group 4 is devoted to designs and models of improved buildings for elementary schools, infants' schools, and crèches. Here, indeed, the schoolmaster is very much abroad, and many of the exhibitors are either altogether unrepresented, or wandering away in remote parts of the building, where it is almost impossible to find them, and it is equally difficult to classify the exhibits that can be found. The first names that appear in the catalogue are those of a few architects who

send, with one or two exceptions, commonplace drawings of ordinary school buildings which show in no case special provisions as to sanitary or healthful requirements. These drawings, as they are here shown, are to be found in the main entrance-hall, intermingled with designs for semi-detached villas and country-houses of a very ordinary type. But leaving these and following the catalogue as nearly as we can, we come, under the heading of "Apparatus for Warming, Ventilating, and Lighting Schools, &c.," to the heating-apparatus of Mr. A. B. Reck (1,279), of Copenhagen, who shows a thoughtful construction of stoves for heating and ventilating by means of hot air. The inventor claims success in every respect, and the minor points of construction are certainly attended to, as will be seen on examining the carefully-prepared diagrams and the specimens exhibited. One of these stoves is about to be put into actual working in the building, when we shall have a fair opportunity of estimating its value according to results, and as it appears to have been largely used in various buildings in Denmark, and competes in price with other systems, it bids fair to hold its own. The London Warming and Ventilating Company (1,280) show their well-known "Gurney" stove, which has proved to be practical and efficient, requiring no more than a passing notice. Messrs. J. Weeks & Co. (1,281) have nothing new to present, but send specimens of their tubular boilers and hydro-caloric coil, which are capable of working with facility in large edifices, in addition to the use to which they are put in horticultural buildings, and to which they were first applied. Messrs. Herring & Son (1,282) give a model to half-inch scale of the warming and ventilating apparatus on the downward flow system,—of which the flow and return pipes, as well as the branches, are of 8 in. diameter,—used for the City of London School, in which the arrangement is well shown. In absolute working we believe that this apparatus has thoroughly answered the requirements. Many other exhibitors of like systems are down in the catalogue, but are not to be found in their places, and if, in the meantime, they rally their forces and wish to be represented, they should do so without delay. A few further scattered exhibits are shown, but of no great interest. Amongst them may be mentioned a model of a Swedish gymnasium of very unattractive interior, and also very incomplete, so much so that we wonder greatly at its appearance here, as it has no bearing upon the subject in any way. An exception to this, and in every way its superior, is seen at Stand 1,304, occupied by Adolf A. Stempel, who sends some good gymnastic apparatus and a very good model and photograph of the interior of a gymnasium, which looks far more workmanlike and suitable and worth the attention of advocates of muscularity. Another good exhibit in this section is sent by Oscar Knofe (1,307), who has the lion's share of space allotted to this class of exhibits, but which is creditably filled with all the apparatus pertaining to the expenditure of energy, which one often thinks might be directed in a more beneficial and, perhaps, more profitable direction; although this is in a measure met by the introduction here of a selection of tennis, racquets, cricketing material, and such like, which to the average English mind must be of the greater interest. Dr. Roth (1,296) brings together a miscellaneous collection bearing upon health and deformity in many ways, and shows us what to do and what to avoid, by means of models and diagrams, examples of food, dress, and furniture, and directions for the treatment and preservation of the senses, more particularly sight and hearing. Turning to a very different subject, we find Mr. William White's "Hygeian Rock" building composition, to which we have previously referred in the *Builder*. Its usefulness in more ways than one is already recognised, and for school building its properties can be turned to good account where economy of space and the ratepayers' money are to be (as they should always be) considered. This brings us to the end of a group which seems to have been unaccountably neglected or entirely overlooked by many who might have had a good opportunity of showing us much that is useful and new, and we find a great deal of space wasted which would have been undoubtedly appreciated by many other exhibitors, to their own advantage as well as to that of the visitors to the Exhibition.

CONFERENCES.

CONFERENCES, on the subjects stated below, will be held during the course of the Exhibition, under the auspices of the societies mentioned. They will be open free to all visitors to the Exhibition. Dates and other details will be announced shortly:—

Royal Institute of British Architects.—"Construction of Houses with regard to Sanitary Arrangements."

Social Science Association.—"Sanitary Legislation."

Society of Arts.—"Water Supply and Distribution."

Society of Medical Officers of Health; Parkes Museum of Hygiene; Sanitary Institute of Great Britain. These three Institutions are amalgamated for the purpose of a conference.—"Domestic Sanitation in the Urban and Rural Districts"; "Industrial Diseases"; "How Infectious Diseases are Spread"; "Notification of Infectious Diseases"; "Disposal of the Dead,—Cremation."

National Health Society.—Some subject cognate to the work of the Society.

Mansion House Council on the Dwellings of the Poor.—"Dwellings for the Poor."

Epidemiological Society.—"Tropical Sanitation."

Society of Telegraph Engineers and Electricians.—"Electric Lighting: Municipal and Domestic." Or on other subjects connected with applications of electrical science.

Medical Society of London.—"The Effect on the Health of Teachers and Children of Overwork in Schools."

St. John's Ambulance Association; National Society for Aid to Sick and Wounded in War.—"Ambulance Work in Peace and War."

Central Chamber of Agriculture.—"Meat Supply."

Association for the Oral Instruction of the Deaf and Dumb.—"Oral Instruction of the Deaf and Dumb."

Institute of Chemistry.—"Food Adulteration and Analysis."

British Bee-keeper's Association.—"Bee-keeping generally."

In reference to our remarks in last supplement (under heading "Sanitary House Decoration and Accessories") about some drawings of mosaic which were hardly up to the mark as "show drawings," Messrs. Diespeker & Co. write that these were not so intended, but were sketches of arrangements made for the approval of architects, and with a practical purpose only.

HEALTH EXHIBITION.

MR. RICHARD ANDERSON, F.C.S., author of "Lighting Conductors: their History, Nature and Mode of Application," makes a Specialty of Testing the Efficiency of Lighting Conductors, and of giving Advice as to the best mode of applying the Apparatus for the Protection of Public and Private Buildings. Leadhill House, 101, Leadhill street, E.C.

Group III. Class XXII. South Annex. BATTEN'S PATENT SEWER VENTILATORS AND MAN-HOLE COVERS. No. 150, LOZELLS-ROAD, BIRMINGHAM. (See p. xxi.)

BECK & CO. (LIMITED), 150, GREAT RUFFORD-STREET, SOUTH-WARK, S.E. STAND 511. EASTERN ANNEXE. VALVES, HYDRANTS, METERS, STREET BOXES, ROAD WATERING PUMPS, PUMPS for Hand and Power. Patent Water Waste Preventing Cisterns and Water Closets. Fire Extinguishing Appliances, &c.

SEMI-VITREOUS WHITE and BUFF PAVING BRICKS, of pure Terra-cotta. GRANITE VITRIFIED PAVING BRICKS, Buff and Grey, of pleasing appearance and enormous strength. CANDY & CO., Lim. (No. 11, Queen Victoria-street, Works, North and South Devon.)

THE COALEROOKDALE CO., Lim. SHROPSHIRE AND LONDON. Holborn Viaduct. Stand 577, Class xxiv., &c., East Quadrant. No. 714, CENTRAL ANNEXE.

MEAKIN & CO. Baker-street, W. CASH PULLERS, SASH FASTENERS, AND NEW PATENT SASH FOR CLEANING.

W.M. WOOLLAWS & CO. Original Manufacturers, ARTISTIC WALL AND CEILING PAPERS free from Arsenic. No. 110, HIGH STREET, near MANCHESTER SQUARE, W.

GLAZED BRICKS. Stand 5, East Central Gallery. THE WORTLEY FIRECLAY CO. Eiland-road, Leeds. Only award to English makers. At International Medical and Sanitary Exhibition, 1881.

YATES, HAYWOOD, & CO. (Lim.), No. 85, Upper Thames-street, London. PATENT IRON STEAM PIPES, SLOW AND FAST COMBUSTION STOVES.

The Builder.

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Open Space About Buildings.

HOUSANDS of inhabitants of London know, daily and hourly by practical experience, that there are evils in store for some one when "eligible building ground" is scored over with

roads placed as near together as



is in any way possible,—and rows of houses erected on each side of them. Plenty of streets of poor three-storied houses, profusely tenanted, will readily occur to the true denizen of the world of London who has a liberal knowledge of its aspects,—its large contrasts,—from palaces and parks to slums and backyards. A row of, let us say, thirty houses runs down each side of the first street of the kind on which the imagination alights; each house with a frontage of about 16 ft.,—160 lineal yards of unbroken frontage of grey bricks and cement. In the streets returning at the ends there are shops with houses over them, a story higher than the three-storied houses so well filled with artisans and their lodgers, or the dwellers in tenements or rooms let separately. Then the water-closets, dust-bins, rabbit-hutches and fowl-houses, belonging to about sixty-five houses,—and their occasional donkey-stables,—derive their ventilation,—equally with the back and wing rooms of the houses,—from the lower portions of a pit about 160 yards in length by, say, 10 yards in depth, the air of which is never stirred except when storm-gusts effect a violent clearance.

The houses have the conventional two rooms on a floor, and a wing-room behind; or they have the two rooms and the little staircase, and no wing-room. If they have the wing-room the space between its end wall and the boundary of the yard is perhaps only about 4 ft. An honourable pride seems to have been taken by the jerry-builders of twenty years ago in making up the "one hundred square feet" by joining narrow little strips of land cleverly together. Sometimes on a very well-packed site, near the corner of a street, the "open space" is of such a shape as Z, ingeniously threaded among the buildings. With the ordinary houses having wings, there will, however, be at least 30 ft. between the back windows of the houses which back to each other. If there is no wing-building, the old statutory 100 ft. led to a space of some 7 ft. being left between back wall and boundary; that is, the back walls of the two rows of houses were placed about 15 ft. from each other, which is

nowadays looked upon by a good many people as too vigorous a piece of squeezing. The 29th Section of the Act of 1855, through frequent reiteration, has apparently fixed itself too firmly in the memories and imaginations of the present generation. It runs thus:—

"Every building used, or intended to be used, as a dwelling-house, unless all the rooms can be lighted and ventilated from a street or alley adjoining, shall have in the rear or on the side thereof an open space exclusively belonging thereto, of the extent at least of 100 square feet."

This provision was more stringent than the schedule (K) of the previous Act, 7 and 8 Vic. (1844):—"Rules concerning Dwelling-houses hereafter built or rebuilt, with regard to Backyards and Areas." Areas of less than 100 square feet were allowed therein for the upper portions of dwellings:—"Every house hereafter built or rebuilt must have an enclosed backyard or open space of at least one square, exclusive of any building thereon, unless all the rooms of such house can be lighted and ventilated from the street, or from an area of the extent of at least three-quarters of a square above the level of the second story, into which the owner of the house to be rebuilt is entitled to open windows for every room adjoining thereto." There were no provisions of a similar kind in 14 Geo. III. (1774).

Growing conviction has thus resulted in special legislation and strong calls for fresh legislation in order to keep some more breathing room at the backs of new houses. When the results in many of the immense additions made to London in the past fifty years have been glanced at, as we have glanced at them above, illustrating by a typical case,—the need for change has always impressed itself upon the observer, unless he was a greedy land speculator or a needy speculating builder living from hand to mouth. No one need be surprised that the *Quarterly Review* should express, in a recent number, its conviction that things are not quite what they ought to be:—

"There is another point connected with rebuilding which has not received anything like the attention it deserves. The necessity of keeping a watch on the construction of new houses has been overlooked. The Metropolitan Building Act is admitted to be exceedingly defective, yet no effort is made to amend it. One of the chief causes of unhealthiness in a house is the absence of back windows and a back yard. The Building Act of 1855 provides that every house shall have an open space of at least 100 square feet in its rear. The required space is the same for a house of the size of the Grand Hotel as for the smallest house. The 100 square feet need not be distributed along the entire length of the house, so that a wall or yard with an area of 100 square feet, placed at one corner of the house, would satisfy the Act; and, finally, there is nothing to prevent the open space from being built on as soon as the house to which it belongs has been inspected and approved by the

authorities. As might have been expected, speculating builders constantly take advantage of the unsatisfactory state of the law. Should the building of artisans' dwellings become, as it is much to be hoped it may, a recognised department of commercial enterprise, the anomaly of the existing state of things would be made unpleasantly clear. It is of little avail to sweep away ancient 'rookeries,' if we allow modern 'rookeries' to be built in their stead. The Artisans' Dwellings Acts provide specially for submission of building plans to, and their approval by, the authorities; but it is to meet the case of private owners building on sites obtained otherwise than under the Acts that an alteration is necessary."*

This occurs in an article in which the subject of the dwellings of the poor is discussed with considerable vigour, knowledge, and common-sense. Among the practical conclusions drawn by the writer is the useful one that things are not quite so bad as people might think, after their study of Dickens and "The Bitter Cry";—that, in fact, there has been a great deal of improvement in London since 1840. He also emphasises what the *Builder* has often put forward with reference to not out-running the needs and powers of large sections of the population. It may be desirable that their habits and their poverty should undergo a change, but the change will be gradually made, and increased quality of accommodation will, for a long time at least, mean an increase in rent, which the very poor will be unable to pay. The necessity of enforcing existing legislation is insisted upon,—Torrens's Acts and Cross's Acts for instance, with some modifications,—especially also the appointment of sufficient inspectors of nuisances, to allow of the registration and regular inspection of small tenement houses. There happens to be a sort of ironical recoil in the words by which a study of existing legislation is recommended to those who seem to stand in need of it. "There is a demand, almost a clamour, for fresh legislation. The newspapers and magazines are filled with schemes and suggestions. The writers for the most part appear to be animated with a pleasing sense of novelty, as if they were treading on unbroken ground. Most people find it far simpler to invent laws than to study them. We are loath to discourage so innocent an amusement. . . . Almost all that Mr. Chamberlain advocates has long ago been done; this tacit approval of existing laws, by a politician not prone to admire the achievements of other times or of other people, is in a sense satisfactory, although the fact that it is unconscious is a little startling."

These sentiments are very proper, and should be taken to heart by those whom they concern, whether they are writing about the principles of compensation for dwellings to

* *Quarterly Review*, No. 313 (January, 1884).

be pulled down, or about the provision of space in the rear of new dwellings. For Section 14 of the Metropolitan Management and Buildings Acts Amendment Act, 1882, deals with this same question of spaces, and has already had considerable effect in the new suburbs. Every new building, intended to be used wholly or in part as a dwelling-house, must have directly attached thereto and in the rear thereof an open space exclusively belonging thereto at least 150 square feet in area, when the frontage of the building does not exceed 15 ft. Such open space must be free from any erection above the level of the ceiling of the ground-floor story, and must extend throughout the entire width (exclusive of party or external walls) at the rear of such building. The area of the open space is to increase with the width of the frontage: up to 15 ft. frontage, 150 ft.; up to 20 ft., 200 ft.; up to 30 ft., 300 ft. Thus a space 10 ft. deep at least must be maintained throughout the entire width. Above 30 ft., the space is to be 450 square feet at the least. The Metropolitan Board of Works may, in its discretion, permit a deviation, so that sites which it may be desirable to use in any very special way may be intelligently dealt with. The sites to which the section applies must have been free from buildings hitherto, so that it will apply in the main to the outskirts. We should not be at all disposed to look with favour on any habit of giving way easily when dwelling-rooms derive their light and air from such limited spaces. The Act is a distinct advance in the right direction beyond that of 1855, and the breathing-spaces are none too large, after all, in such cases. When the dwelling-rooms, as in corner and valuable business sites, can be well lighted and ventilated from the streets, there may be hardship in, and sometimes no strong necessity for, insisting on so much open space at the back.

In the Model By-laws, with reference to new streets and buildings, issued by the Local Government Board in 1877, an attempt was made to secure throughout the country something like the spaces now prescribed for London by the Act of 1872. These By-laws have been adopted with minor modifications by many Local Boards. In the rear or at the side of every new domestic building is to be an open space exclusively belonging to it, of not less than 150 square feet, and free from any erection thereon above the level of the ground, except a water-closet, earth-closet, or privy, and an ash-pit.

In London the Acts of 1855 and 1882 are to be read together, so that an open space of 100 square feet must be left on the ground-story when rooms are lighted therefrom, and the 150 square feet and so forth above the level of the ceiling of the ground-floor. A space of not less in any case than 10 ft. must be left,—if the Model By-laws are followed,—between every building and the boundary of any lands or premises immediately adjoining. If the building is 15 ft. high, the distance to be increased to 15 ft.; if 25 ft. high, the distance to be 20 ft.; if 35 ft. high or beyond, then the distance to be 25 ft. at the least. In the By-laws as adopted, the wording is frequently changed, so that the 15 ft. of height becomes "a two-story building," and the 25 ft. of height "a three-story building"; the 25 ft. of space applying in the case of a building of more than three stories. There is usually in the country a clause of a moderating kind, the fellow of that in the London Act of 1882; such as, "When, however, thorough ventilation of such open spaces is secured, or when on the rebuilding of houses within the district, these dimensions cannot be adhered to without considerable sacrifice of property, they may be modified in special cases at the discretion of the Local Board." The filling up of open spaces so left need not be such a terror to the public as it is to the Quarterly Reviewer. Their preservation is implied by the nature of the case, and the By-law usually adopted to say so seems to be rather like surplusage as far as its legal bearing is concerned,—though it may be useful sometimes in making assurance doubly sure to those who would be disposed to question if they could. This By-law directs that "when- ever any open space has been left belonging to

any building when the sanction of the Local Board has been obtained for its erection, such space shall never afterwards be built upon without the approval of the Local Board." The Local Government Board at first suggested finer phrases,—indeed, there is a beautiful stilt in,—"A person who shall make any alteration in or addition to such building shall not, by such alteration or addition, diminish the aggregate extent of open space provided in pursuance of this By-law in connexion with such building."

THE MEISSONIER EXHIBITION IN PARIS.

By this public exhibition of his collected works, extending over half a century, M. Meissonier seems to have wished to forestall in some measure the verdict of posterity. It was a dangerous experiment, but it has succeeded beyond all expectation. It is rare, indeed, that an artist has such an opportunity of celebrating, under the auspices of charity, his *golden wedding* with his art. It is rarer still to find an artist who can stand such a test. M. Meissonier's views on art have doubtless undergone many modifications, and even changes. He, like every other restless spirit and ambitious genius, has dreamed of fresh conquests, sought out new methods, discovered unknown regions in art,—has, in a word, "changed his manner." But we can trace no fatigue, no failure in power from first to last, and the present exhibition will not only afford the purest enjoyment to all who visit it, but it will furnish a most instructive lesson to all artists and connoisseurs of art.

M. Meissonier's early work begins in 1834, and is here represented by a small canvas, "Les Bourgeois Flamands," sold for 100 francs, at the close of that year's exhibition. This is the Alpha of the painter's career. His "Paris, 1870-1871" (an allegory of the siege of Paris), signed 1884, is its Omega. His most important composition, entitled "1807," representing a review before the Emperor Napoleon I., forms part of the gallery of Mrs. Stewart, of New York, who paid 300,000 francs for it in 1877, and has not lent it for this exhibition. Sixty-seven studies and a large photograph of the completed picture give as exact an idea of it as possible.

The catalogue of the exhibition contains 147 numbers, only about two-thirds of the artist's known works. Different circumstances have combined to prevent their entire collection. America, where M. Meissonier's works have, been greatly in request, especially during the last fifteen years, sends nothing; the names of neither Vanderbilt nor Stewart appear in the catalogue. The excessive duty on works of art has alarmed some owners, while others have hesitated to run the risks of the voyage, and some few, tired of repeated calls on their generosity, have point blank refused to lend their treasures. Sir Richard Wallace, for instance, sends only five of his seventeen pictures by M. Meissonier in his gallery. Nevertheless, putting aside the "1807" (the studies for which are here, and are even more interesting than the picture itself), this collection of 147 works gives the absolute and perfect measure of the powers and genius of the artist.

For the last ten years, one charitable work in particular, "L'Hôpitalité de Nuit" has been an object of interest to that section of Parisian society which is still known as the Faubourg St. Germain. The exhibition is held in aid of the funds of this Society, so that the attraction of charity exists side by side with the interest inspired by art. The expenses are heavy, the insurance alone amounting to twelve million francs. Vanity and self-deception play their parts even where charity is concerned, and the name of one art-collector might be given who has exacted for a single work about 10 in. high, an insurance of a million francs. In those cases where the amount has been left to the discretion of the manager of the exhibition, M. Georges Petit, he has been less extravagant, though still very generous; the five pictures, for instance, from the gallery of Hertford House, are insured for 500,000 francs. These

expenses, together with those of removal, &c., will have to be deducted from the receipts, but the poor will nevertheless, profit considerably. The first day's receipts were 20,000 francs; and it is estimated that M. Meissonier will be enabled to hand over at least 200,000 francs to the treasurer of "L'Hôpitalité de Nuit." It is a right royal gift from the hand of an artist, but the public interest excited and the admiration of his contemporaries will go far to acquit the poor of their debt to M. Meissonier.

Which, among the works here collected, are the most incontestably great and the most celebrated, and by what special qualities are they distinguished?

The choice is less difficult than might be supposed. The professional critic, the genuine amateur,—all, in fact, whose judgment has any value,—are, for the most part, unanimous on the subject. Every one of the pictures is of interest; but there are twenty paintings here of which it may be said, that hung side by side with the Terburgs or other great masters, whose style they follow, in any gallery in Europe, they would be able to hold their own in depth of conception, in carefulness of execution, in harmony of tone, and in correctness of detail. We will select twelve of the most striking from among these twenty compositions:—1, "La Rixe" (lent by Her Majesty the Queen); 2, "La Barrière" (M. van Praet, Belgian Minister); 3, "Le Dimanche" (Duc de Narbonne); 4, "Les Amateurs d'Estampes" (Sir Richard Wallace); 5, "L'Homme à l'Épée"; 6, "Le Déjeuner" (M. van Praet); 7, "Les Bravi" (Sir Richard Wallace); 8, "La Lecture chez Diderot" (Baron E. de Rothschild); 9, "Solferino" (Luxembourg Gallery); 10, "1814" (M. Delaunay); 11, "Le Chemin de la Salice" (M. Péronne); 12, "Le Voyageur" (M. Deferet).

The special characteristic,—the distinctive mark of Meissonier's genius,—is his power of exhausting his subject, going to the very bottom of it, and appealing to the spectator with an intensity which penetrates him to the very soul. "La Barrière," for instance, shows us a narrow deserted street; the shutters of the shops are closed, and corpses, stiff in death, are flung upon the pavement in terrible attitudes. The scene is full of horror. It is civil war personified, symbolised, and stereotyped for ever upon a panel a few inches square, by an artist who shows that he feels the horrors he depicts in their fullest intensity, and whose eyes, perhaps, were dim with tears as he sketched the scene *from life*, hearing as he sketched the dull boom of the distant cannon dispersing the last of the rebels.

The method by which our artist seeks to attain his end is a rigorous and almost incredible fidelity to anatomical correctness of form, supplemented by a profound and intuitive comprehension of the expression, the gesture, the moral reflection, as it were, of the inner thought of his subject, of the very essence of its being. This point, containing as it does the whole secret of the painter's art, is especially to be insisted on. Where others see a mere bodily form, he sees a reflection of the thought which animates it, and it is this fact which prevents his ever being uninteresting, even when his subject seems most commonplace. Take, for instance, one of his pictures entitled "Jeune Homme travaillant." The young man is seated in the light of a window, before a table covered with a green cloth and strewn with books; he is absorbed in his work, and bites the nail of one of the fingers of his left-hand, evidently in search of an idea. The subject appears trivial, but the painter has gone so deep into the heart of it, the thinker is so evidently on the track of the idea which eludes his effort to seize and transmit it to paper, that this little picture cannot fail to excite strong interest. The painter has concentrated his will and bent his whole force on representing through his model the tyranny of a fugitive idea; and the means of expression which he has employed are left unnoticed by us. His aim is the same, whatever may be the subject which he chooses, whether it be an epic like his "1814" (an episode of the French campaign), or a familiar scene like "Les Joueurs de Boule," a simple

genre subject representing a garden group in the costume of the eighteenth century. Conscientious study, power of design, correctness of movement and attitude, individuality, and the accessories of place, of time, of atmosphere, of vegetation,—all are observed and depicted with equal power. From this conscientious and far-reaching industry of genius, going back to the very germ of its subject, there results,—first, individuality marked and unmistakable; and, secondly, the very soul of expression in all its depth and mystery.

Those who have lived in daily intimacy with this extraordinary genius, might expatiate freely on his habits and methods, or give examples of his singular conscientiousness, said by some to be carried to excess and to savour of eccentricity. The biographer of M. Meissonnier would feel called upon to relate, for instance, that when he painted the Staff of Napoleon I. for his famous picture "1814," he bought the horses required for the group, set to work to find uniforms that had belonged to Marshal Ney, Bertier, M. de Flahaut, General Drouot, and General Gouraud, and, in order to give the true idea of the desolate road, deep in snow, in which the wheels of the artillery cars and baggage-wagons were hopelessly plunged, he carried his conscientious fidelity to nature so far as to have a real road constructed on an inclined plane in his park, and to drive along it real cannons furnished through the kindness of the General Commandant of Artillery. This proceeding may appear childish or pedantic, and many will hold that genius should see these things "in the mind's eye," without feeling the necessity for their visible representation. Eugène Delacroix, for example, did not go to nature when he painted the stormy waves which threaten to engulf his wonderful "Barque de Don Juan."

But M. Meissonnier's extreme of conscientious study achieves the same result as the intuitive inspiration of other artists, because, when he has finished his work as the most minute of observers, the most accomplished of draughtsmen, he takes it up as an artist and a philosopher, and thus perfects the painter's ideal. His Napoleon, vanquished and in retreat, betrayed by the fickle fortune which had showered upon him so many and such brilliant triumphs, rides at the head of his staff with bent head and gloomy brow, one hand thrust in the bosom of his grey overcoat, his whole attitude and demeanour unmistakably showing that he foresees Waterloo, exile, and St. Helena.

It is the painter's highest privilege to beget a whole world of sensations and ideas in the minds of those who study his works, and this privilege belongs to M. Meissonnier in as great a degree as to any of the greatest masters of his art.

But we must bring our remarks to a close. We have attempted only to give an idea of the interest inspired by this collection of works representing fifty years of an artist's life. In 1840 he had formed his style; and in 1855, or thereabouts, he had reached the meridian of his glory as a painter; and here we use the word *painter* as expressive of the actual material of painting,—that is, its surface, atmosphere, warmth of tone, and delicacy and power of the brush, characterising most especially the work entitled "L'Homme à l'Épée," dated 1852. His "1814" (the episode of the French campaign) is dated 1864, when he was in full enjoyment of his philosophic powers. The period between 1870 and 1884 represents a later manner, in which the artist is less of a painter (in the sense in which we have used the word) and more of a delineator. One characteristic detail, pointing to a modification or alteration of a physical sense produced by advancing years, marks this final stage of M. Meissonnier's work. His eye, faithful as a photographic lens to record what he sees, leads him to enlarge objects in the foreground beyond their true proportions.

To conclude: it is a rare, perhaps a unique experience, to find an artist collecting the works produced by him during fifty years of his life, and exhibiting them to a public which fails to discover in them any proof whatever of weakness or decaying genius.

THE RESERVATION OF THE RIGHT TO LIGHT.

The difficulty of applying legal principles to facts of a complicated nature is seldom more clearly seen than in cases which arise out of the law of light. It is a perfectly plain legal proposition that a man cannot derogate from his own grant. The application of that principle to questions of light is thus stated in article 14 of Roscoe's "Digest of the Law of Light":—"The grant of a tenement over which light comes to a building, both being the property of one owner before such grant, gives the grantee of the former the right to prevent the right to light from accruing to such building whether it remains in the possession of the grantor or is subsequently transferred to another." But although the application of the principle to the particular subject is thus clear, it is often very difficult to work it out in practice. The most recent example of this difficulty is to be found in the important case of *Russell v. Watts*, Law Reports 25, Chancery Division 539, which, after being decided one way by Vice-Chancellor Bacon, was afterwards decided in another by the majority of the Court of Appeal. It is important, both in its bearing on the rights of persons in buildings of a large and partially connected kind, and also as an example of the tendency of this particular law gradually to increase its operation.

The action arose out of disputes in regard to a large block of buildings well known to all persons in Liverpool as Compton House. Without entering at length into the rather complicated transactions in connexion with that building, it will probably make the decision clear if we state the salient facts on which it turned. In 1865 the original Compton House was destroyed by a well-remembered fire, and Jeffrey, the proprietor, intended to rebuild it as one large structure. But for several reasons it was impossible to carry out this plan, and accordingly it was to be rebuilt in several blocks, shut off from each other by iron doors and shutters, and dependent to a large extent upon each other for light. There were to be seven blocks alphabetically distinguished. During the progress of the building, which was not completed till May, 1867, Jeffrey obtained advances on the security of it. On the 30th June, 1866, he mortgaged blocks C, F, and G, by demise to Messrs. E. & R. Moon. In this demise his intention to build other blocks upon the rest of the land was recited. On the 7th of August, 1871, the Moons obtained possession, in consequence of the bankruptcy of Jeffrey, and in 1876 Mr. Watts purchased these three blocks. In the same manner, block B was mortgaged on the 17th December, 1866, and subsequently, by similar intermediate transactions, came into the possession of Russell. In 1880 Mr. Watts blocked up sixteen windows in block B, six of which derived their light from a large open space in the centre of the building in block D, and ten from a small open space or well-hole over the ground-floor of a portion of the premises in C. But it also appeared that the rooms could be lighted, though not so well from the internal well in Block B itself. Upon this the plaintiff Russell applied to the Chancery Division. Supposing this Block C to have been an ordinary house, and Block B, another house which was near and passed from the grantor to a transferee, he, the owner of Block C, being the one to whom the property was, in point of time, first transferred, would, on the principle for which Wheeldon v. Burrows is the chief authority, have had the right to obstruct the light of his neighbour as much as he pleased. But in the present case the circumstances were somewhat unusual, and this raised a difficulty which puzzled the Court of Appeal. The majority of that court thought that the principle was applicable because there was no express reservation of the right, and likewise no implied reservation, either as a matter of necessity or having regard to the circumstances of the case. Lord Justice Lindley, on the other hand, considered that there was a reservation of the right, because "this is not," he said, the case of a vendor

of a piece of land attempting to derogate from his own grant. It is more like the case of several persons interested in several pieces of land all agreeing to build on them in a particular way so as to accommodate one another, and of one of them afterwards, when the buildings are up, insisting on rights which are quite inconsistent with the enjoyment of the buildings as erected." And the same judge further points out that in the original mortgage deed there was clear notice to the mortgagees of the manner in which it was intended to erect the other blocks. But again, as Lord Justice Fry pointed out, there was nothing to show that Jeffreys, when he mortgaged Block C, ever intended to part with the possession of the other blocks, and that the case did not resemble one arising out of a building scheme where separate tenements are intended to be separately enjoyed. Again, this same judge pointed out that there existed the plain rule of law; and he cited the high authority of Lord Westbury to the effect that it is "more reasonable and just to hold that if the grantor intends to reserve any right over the property granted, it is his duty to reserve it expressly in the grant rather than to limit and cut down the operation of a plain grant by the fiction of an implied reservation." Yet, strong as this legal reasoning is, it will probably appear to most persons somewhat unreasonable that a transferee taking property of this character should be able, from the fact that his grant is a few months prior to the grant to another of another block of buildings in close proximity, to injure that building in virtue of a legal principle, however plain. Few would hesitate to apply the popular maxim of "Live and let live" to such a case as this. Unfortunately if the owners of block C had not interfered with the light to block B, it by no means follows that the owners of the latter would have carried out the above maxim. When the prescriptive period had passed, and they had attained an indefeasible title by lapse of time to the light to their windows, it would be highly probable that had the owners of Block C wished to make some alteration which somewhat darkened the other windows, he would have been served with an injunction. Thus, from whatever point of view the case is regarded, whether from the standpoint of strict legal principles or from that of the convenience of the moment, it is hardly possible to say that any result could have been practically satisfactory. It is obvious, however, that if difficulties of a similar kind, in similar cases, are to be avoided in the present position of the law of light, it can only be by the careful regulation of the correlative rights at the commencement of transactions such as these. If Jeffreys had defined the actual rights of the transferee of Block C, and then, when he transferred the blocks, had, in like manner regulated the rights in respect of them, so that neither one nor the other could have been injurious to its neighbour, it is clear that this expensive and vexatious litigation would have been avoided. The case shows, indeed, the absolute necessity for owners of property and their agents in large towns, to be more careful in making satisfactory arrangements in the transfer of property in regard to the right to light.

NOTES.

THE Earl of Camperdown deserves the hearty thanks and warm support of the London water-consumers for the Bill which he presented to the House of Lords on the 27th of May last. Citing in the preamble the provisions of the 70th and 74th sections of the Waterworks Clauses Act of 1847, which enable the water companies to demand payment for three months in advance, on the claim for a total sum, without any statement of particulars, under penalty of cutting off the supply, Lord Camperdown's Bill provides that the claim or demand note shall be accompanied by particulars by which the sum total claimed is made out, including the annual value on which the percentage charge is levied, as well as any additional items; and that the

payment shall not become due until the delivery of such particulars. It is almost incredible that the law of the subject should be in a state requiring such an amendment. Of its justice to the consumer there can be no doubt, nor do we think that there can be much question that it is also to the real advantage of the companies.

From a letter signed "Laicus" in a Liverpool paper which has been forwarded to us, it appears that some of the inhabitants of that city are by no means pleased with the site selected for the proposed cathedral, on the ground that it will only give room for a third-class cathedral in point of size, which is true enough, though a fine building and a fine effect may be realised there, putting size out of the question. The statement is that the clerical party have favoured this site with the view of the early realisation of a building which would be a centre for their own party: a matter into which we cannot go, even if we had the data for forming an opinion. It is to be supposed that in the present day a cathedral is to be built partly in accordance with practical needs, in relation to the space required for worshippers. The greater Mediæval cathedrals were really spectacular rather than practical. Architecturally, of course, it would be delightful to build an immense cathedral on the largest scale, but in our present view of life there are so many other important things to be done in the way of improving town architecture that it may be doubted whether many persons would consider expenditure on a great spectacular cathedral morally justifiable.

It is understood that a proposed "restoration" of the church at Stratford-on-Avon is to be averted by the interposition of the Society for the Protection of Ancient Buildings, whose architect has examined the church and is to report upon it to the local authorities. We should certainly be opposed to anything like unnecessary tampering with a building connected with associations of such peculiar interest to all Englishmen. But we may be allowed to suggest that the report of a Society which represented the old nave roof of St. Alban's as in a sufficiently sound state for preservation, and the debased west window of Tewkesbury as one of the finest late Perpendicular windows in the country, should be taken *cum grano*.

The competition for the Architectural Association Travelling Studentship this year, which was decided at the meeting last week in favour of Mr. G. J. Oakeshott, brings out a great deal of good work, considering especially that it only holds out the moderate pecuniary reward of 20*l.* towards travelling expenses for a five weeks' tour, half of which is contingent on the candidate satisfying the committee with his further sketches made on the tour. Mr. Oakeshott's work consists of measured drawings of part of the Triforium of the South Transept, Westminster Abbey, and of the Tomb of Filippo Decio in the Campo Santo at Pisa, the latter including some very good and clean drawing of Renaissance detail. The competitors most commended are Mr. G. G. Woodward, Mr. G. G. Wallace, Mr. Bidlake, and Mr. Selby. Mr. Woodward's drawing of the curious Romanesque Chapter-house Arcade of St. George at Boscherville is a very interesting and valuable bit of architectural illustration; he also gives some interesting Renaissance work from the Hôtel de Bourgheroulde at Rouen. Among the remaining work of these five gentlemen are details from Westminster and Lincoln by Mr. Selby; from the Chapter-house at Southwell, by Mr. Bidlake; and from St. Mary's, Bury St. Edmund's, by Mr. Wallace. Some of the drawings we shall publish shortly. Of these five competitors, all except Mr. Woodward are students at the Royal Academy. It is worth notice that most of the winners of the Association Studentship have subsequently gained the Pugin Travelling Studentship of the Institute. This is only the fourth year of the institution of the Association Studentship. In the first year it was awarded to Mr. H. H. Kemp, and the second prize to Mr. Francis

Hooper, who obtained the Pugin Studentship the following year (1882). In the second year the award went to Mr. W. A. Pite, who obtained the Pugin Studentship in 1883; and last year it was awarded to Mr. J. G. Sankey, who obtained the last Pugin Studentship in January of this year, and some of whose sketches we published. It now rests with Mr. Oakeshott to keep the ball rolling in the same fashion. The Association Studentship is limited to those under 23, the Pugin to those under 25, so that the arrangement of the two is in a measure suggestive of the sequence we have alluded to. The work to be done for the Association Studentship is more strictly defined than that for the Pugin, which, in fact, is understood to be not so much a "competition" as an "election."

UNDER the auspices of the Franklin Institute, an International Electrical Exhibition is to be held at Philadelphia in September, to open on the 2nd of the month. No awards or premiums will be offered by the Institute, but in place thereof a report to the Institute will be prepared by the Board of Examiners, which will be as full as time and opportunity will permit. This is a step in the right direction. It is time there should be an end of the lavish awarding of medals of merit, &c., at such exhibitions, which are often given in so broadcast a manner as to detract much from any distinctive value they might otherwise have, and which are too often used only as a means of advertising the recipients. The Franklin Institute reserves the right to enter into such other scientific work, touching the Exhibition (not requested by the Exhibitors) as in its judgment may tend to the advancement of science. Information is to be obtained from the secretary of the Exhibition Committee, Mr. W. H. Wahl, at the Franklin Institute. The general classification of exhibits will be as follows: Section I., Production of Electricity; II., Electric Conductors; III., Measurements; IV.A, Applications of Electricity requiring Currents of Low Power; IV.B, Applications requiring Currents of High Power; V., Terrestrial Physics; VI., Historical Apparatus; and VII., Educational and Bibliographical. The published synopsis gives elaborate subdivisions of work under each section. The arrangements for the Exhibition seem to be on a large scale, and of a most methodical character,—and it ought to prove an important event in the development of electrical work.

In the case of *Barnard v. Carr*, heard last week before Mr. Justice Field, the plaintiff sued the defendant for infringement of his right of light for building up on the site of a former high trellis, which many people will remember adjoined the former mansion of Baron Grant, where the building operations of the defendant were being carried on. Notice had been given to the plaintiff of the trellis, and he had not objected, and the Judge, admitting the right of light, nevertheless ruled that the new houses, at the distance of about 18 ft. from the plaintiff's windows, did not interfere with the comfortable enjoyment of the plaintiff's house. Nothing seems to have been said in the judgment as to the question of selling or letting value of the house, which plaintiff urged had been diminished. The two grievances hardly stand or fall together. An owner may find it difficult to show how his own comfort is interfered with in such a case, but he may nevertheless find that the selling value of the house to another owner is affected. There is all the difference under such circumstances between a trellis partly covered with foliage, and a brick wall.

The Prince of Wales has accepted the office of President of the Royal Windsor Tapestry Works, which the late Duke of Albany formerly filled. In a letter addressed to the Court of Common Council at their meeting on the 29th ult., his Royal Highness added a memorandum suggesting means by which support might be given to this art industry, viz. :—

- (1) By donations towards the endowment fund;
- (2) by orders for tapestry panels, historical or alle-

gorical, for the decoration of public or private buildings (the sketches or cartoons necessary for the execution of these works might be made the subject of competition at the Royal Academy or other art schools); (3) by orders for the repairing of old tapestry."

In supporting these suggestions we should like to add a note as to what we have before commented on, the necessity of selecting subjects suitable for tapestry treatment; conventional ornament, or figure subjects intermingled with conventional ornament; but, at all events, not realistic figure subjects, and still less realistic landscapes, which, in tapestry, are apt to have not even the merit of realism.

WE published a fortnight since a carved oak door-head, executed by the students of the School of Art Wood-carving at South Kensington. We may mention that in the central annexe of the Health Exhibition there is a carved walnut fireplace, hall-seat, and a case of carved panels and other work, executed at this school, which may give further illustration, to those who are interested in the matter, of the work which is done at the school. The Health Exhibition seems an odd place to look for it, certainly, but, as we observed in our general remarks on the Exhibition, this central annexe seems more devoted to art than science; a kind of guiding of the sanitary pill.

THE fall of part of the tunnel at Denmark Hill Station last week seems to add another to the number of practical cautions in regard to cast iron. Four girders gave way, and, in two of them, a serious flaw, we are told in the newspaper reports, existed at the point of fracture, the metal having been blown with numerous air bubbles. No other reason was suggested to account for the accident.

A bust of Burns, by Sir John Steell, the eminent Scottish sculptor, is to be placed in Poets' Corner, Westminster Abbey, near the bust of Thomas Campbell. The example of the Dean of Westminster may, perhaps, have some effect upon the Dean and Canons of St. Paul's, and may lead to the disinterment of the statue of Byron, which is understood to be lying somewhere in the crypt of St. Paul's Cathedral, and to the erection of the statue in a suitable position. The public need some antidote to the statue of the poet in Hamilton-place.

MR. FLINDERS PETRIE has discovered in Lower Egypt the fragments of what seems to have been a truly wonderful colossal statue of Ramesses II., which, deducing the height from the scale of the fragments, must have stood 100 feet high. The execution of such a work in granite, and the placing of it when completed, certainly supply a kind of comment to the scriptural note that "there were giants in the earth in those days." Two considerations, however, may console us for our littleness in these degenerate days, viz., that material size in art is not essential greatness; and that the execution of works, on such a scale, for the glorification of one man, means, as Buckle said in his brilliant way, forced labour and tyranny.

MR. G. H. STATION read an interesting paper on "Wood Pavement in the Metropolis" at the ordinary meeting of the Institution of Civil Engineers, on the 27th. The greater part of the London Wood pavements, he stated, was composed of blocks of bright Swedish yellow deal, and he knew of no wood which stood the wear of traffic and atmospheric changes so well. Of hard woods, pitch pine he had found to take a high place in regard to wear, the ascertained annual vertical wear of the section in King's-road (Chelsea) having been only .055 of an inch in four and a-half years; a surprising result considering what it is subject to. Neither elm nor oak will stand the atmospheric changes; larch, he thought, would take a high position, but the supply was limited. The cost of repair and cleansing he gave as 4*d.* per square yard per annum, as against 1*d.* for macadam previous to the substitution of wood.

SOME tasteful and very beautiful pieces of furniture have been sold this week at Christie's, amongst the collections of the late General Sir George Buller. Messrs. H. & J. Cooper, whose applications of Bartolozzi engravings to furniture we lately reviewed, have done well to stroll down to King-street to see how excellent is the effect of "two Sèvres plaques" let into the front of an old French "Bonheur du jour" cabinet. Most of the furniture is in the graceful rectilinear style of Louis XVI., and in many of the pieces these porcelain plaques have been used in a way that is effective without being obtrusive. Sir George Buller's effects include, besides a large and valuable collection of plate and silver, a quantity of porcelain, Sèvres, Dresden, and Oriental, and some fair bronzes. It is a collection like many another that comes to the hammer at Christie's, from which the young man who has no great riches must go away sorrowful. The best of an indifferent lot of pictures are, perhaps, two by Jacob Ruysdael. Only at the Hague is Ruysdael seen at his best. There is a little picture here (No. 157, "A Road through a Cornfield") which, whilst it does not come near to his masterpieces in Holland, is yet finer for its effects of light and distance over a flat landscape, and more delightful than anything we know by this painter in England.

We have received a copy of the illustrations of the Royal Academy Exhibition, edited by Mr. Henry Lassalle, and published by Messrs. Chapman & Hall, a kind of imitation of the illustrative pamphlet of the *Salon* pictures, which it has been lately customary to issue in Paris. Many of the illustrations are well executed, in various processes. Some are not so satisfactory; but the extraordinary point about the book is that it omits nearly every one of the leading pictures of the academy, giving only the secondary (in some cases very secondary) works. We cannot for a moment suppose that this is from oversight or want of knowledge as to which pictures ought to be illustrated, and, therefore, conclude either that the leading artists are unwilling to have their works reproduced in this way, or that the copyright in such reproductions has been already secured for another publication. We regret the failure, because a handbook of pictorial memoranda of the pictures and sculpture of the year, without any such often foolish and jejune comments as constantly irritate the initiated in the "Academy Notes," would be a very useful and interesting record to have, and we should be indebted to those who made it up. But if it was impossible, from whatever cause, to secure the best works, it would have been wiser to drop the enterprise for this year, and endeavour to make more satisfactory arrangements for the future. That our comment is not uncalled for will be understood when we observe, without going further than a few names, that the illustrations do not include one work by Sir F. Leighton or Mr. Millais, nor Mr. Orchardson's "Marriage," nor any of Mr. Brett's works; in fact, nothing which goes to make the real value of the exhibition is included, except one or two things among the sculpture. The publishers would be wise to withdraw the work; it will cause only dissatisfaction to purchasers. We would support it gladly otherwise, but it is impossible to do so under the circumstances.

ARCHITECTURE AT THE ROYAL ACADEMY.

CONCLUDING NOTICE.

This year Mr. Waterhouse exhibits five drawings. No. 1,048 (Warkworth) is a landscape pure and simple, without any trace of architectural subject. It is beyond question one of the most brilliant and facile water-colour drawings in an exhibition which is exceptionally strong in water colours, even for the Academy. No. 1,258 (staircase, Owens College, Manchester) is an architectural subject treated with the skill which Mr. Waterhouse always brings into play when dealing with this particular feature, as shown conspicuously in his great work at Manchester. The three other drawings, Nos. 1,283, 1,296, and 1,314, are hung

in the architectural room and have architectural titles; but they are, in fact, landscapes with architectural incidents. In each case the building has been, it may be presumed, outlined in brown ink by another hand and with no great feeling. This receives a coat of red paint and but little more, and then one of the most dexterous colourists of the day addresses himself to the enjoyable part of his task. Swirls of copper-coloured clouds stretch across his skies, their cool shadows fitting athwart pleasant foregrounds, and the circuits of his sites are fringed with trees free from those singular characteristics which mark the conventional growths of the trees of ordinary architectural draughtsmen.

In one of these clever drawings the building works are in progress,—spoil banks and "plant" are scattered about in picturesque profusion, and a contractor's engine sends a puff of blue smoke across the building, taking off the spectator's attention from what is treated quite as a secondary matter. In another drawing, semi-tropical plants of prodigious size sway their long and broad leaves in the clear air, and the shadows on the walks and banks are eloquent of a sunnier clime than ours. Many of the passages of colour are really exquisite,—dainty, yet true, and sources of delight both to their author and to us. One particular glimmer of pale amber behind a group of grey-blue trees is as sweet and tender as one can conceive. All which may be magnificent, but it is not architecture.

It is instructive to note the various methods which men of talent pursue to the same end. In the drawings of Mr. Shaw no human figure is ever seen. He fills the whole space at his command with his building, bringing it clean up to within an inch of the margin of the drawing, and cutting off the foregrounds of his subjects as close as possible. He bestows all his care on the building itself. Elaborates every detail to the highest point, and enlarges the scale of his work with a view to such elaboration. Mr. Waterhouse plants a comparatively small structure in an ample field of white paper, gives the building solidity, by covering it wholly with a strong tint, appropriate of course, and truthful, both as to its local colour and pitch against the sky; scumbles over it with a dry brush, and models it into an approximation to the effect of the original, with a few impatient touches, and brightens it up with impasted lights; breaks its leading lines by well-drawn figures, singly or in groups; and leaves it to its fate, while he draws in front of and around it the prettiest of landscapes. We are grateful to him for the pleasant colour, and not a little proud of an architect who can thus meet a painter on his own ground and on equal terms. But we are nevertheless not altogether satisfied with what he gives us. We remember the large detail drawings, architectural studies for parts of his previous works, which have at long intervals adorned the Academy walls, and it is for a sight of more of these that we crave. The studies for the beautiful and appropriate ornamentation of the Natural History Museum would be enjoyed by us much more than his most skillful landscapes. There are crowds of competent landscape artists; but the men who could design such ornament as that may be counted on one hand. We would go so far as to exchange Mr. Waterhouse's best picture for an example of his equally artistic and perhaps more difficult planning. The public, no doubt, are more gratified by a sight of what they can understand, the counterfeit presentment of such familiar things as grass and trees and sky; but while he fills them with good things there is no reason why we should be sent empty away. Next year he will have "ample room and verge enough" to satisfy both classes of his admirers. Will he take this hint and address some of his next year's exhibits in the new architectural gallery to architects?

A very delicately-coloured view of "Somershill, Kent," showing the North Court recently added" (1,306), by Mr. T. H. Watson, is undoubtedly a very pretty drawing, and is in the main true to nature when that goddess is in the very best of humours. The architecture, which is of a very homely phase of late Tudor, is quiet and unostentatious, and the grouping and arrangement of the parts pleasantly diversified. Detail there is none,—at least, in the view given, although one cannot help feeling that there must be behind such an exterior

some good interiors which would pay for drawing, and which we may hope to see another day.

We must conclude our somewhat discursive series of notices of a very interesting exhibition with a reference to Mr. Ernest George's two exhibits, Nos. 1,239 and 1,271, which do not differ either in design or draughtsmanship from his many previous contributions. That they are picturesque to a degree is beyond dispute. They can scarcely claim to be original; for almost every detail is reproduced from earlier buildings, and in spite of their piquancy and the welcome which we cannot refuse them as a departure from the gloomy monotony of our streets, we cannot say that as *architecture* they strike us as having any very great merit. They are good,—perhaps the best of their kind; but they bear the same relation to really fine art as the best of the late Mr. Byron's burlesques bear to the best of Shakespeare's comedies.

QUAINT CORNERS OF CAMBRIDGE.

"O sacri fontes, et sacre vatibus umbrae!
Quas recentis avium Pieridumque chori!
O Camus! Phoebo nullus quo gratior annis!"

COMLAT.

It is often a great advantage to be able to see things in a different way from other people. This does not necessarily imply eccentricity or affectation, but is produced by a wholesome originality of mind and vision, which not only casts fresh light upon the things seen, and upon the way in which they are regarded, but gives an intense pleasure to the possessor of that advantage. To catch a stray beam of coloured light which is lost in the recesses of some grand edifice; to trace among the stonework of a neglected ruin the remnants of some delicate piece of masonry; to perceive in the gloom of some trafficless street a more beautiful point for the contemplation of an ancient building; to feel that some landscape shows to more advantage when shaded by the rubied light on an after-glow; or that a river scene is loveliest when the wind plays among its willows at morning dawn; these are all little pleasures of infinite value which accrue to him who has the advantage of seeing things in a different manner from that in which other people see them. How, then, to obtain this advantage? To make a point of striving for it will not always help us, for that would lead to a contemplation, strained, fantastic, and affected; to trust to natural instinct alone would be detrimental to our discrimination of the various grades of beauty, and no doubt lead to a choice arbitrary, inconsiderate, and egotistical. It is, then, by a mingled study of taste and feelings, by a careful comparison of facts and thoughts, that we can alone obtain an advantage which will enable us to reap an additional pleasure from the things we see; to discover, in fact, "quaint corners" in the ordinary pictures of life, which even if they do not merit the title of "beautiful," still have in them a certain charm, which is easier felt than perceived. What an enormous addition to the stock of pleasure of his life, for instance, would it be, if, having this advantage, the London lawyer or the business man admired every morning on going to his work, some "quaint corner" of Lincoln's Inn-fields or Fleet-street, and felt that admiration increase. Chances are everywhere to be had, and if not in art, then at least always in natural surroundings; but there is scarcely a town or village in England where we shall not find some little nooks that are worth being pleased about.

Cambridge is one of the towns that possess numberless "quaint corners," but, owing to the many beautiful buildings and sights with which it abounds, they are often quite overlooked. No one, for instance, who walks down the King's Parade admiring the chapel and the screen, would think of looking at it from any other point than that from which he could take it all in at once; and yet, if he seeks a more dainty picture, he will find it by turning down St. Edward's Passage, a dark and narrow little place where only two can walk abreast. Standing in the centre, with St. Edward's Church on his right hand, he sees at the end of the street the light grey stain of the screen with its arches and pinnacles; on either hand are dingy old houses, and from a doorway on the left side is suspended a huge red lamp, which hangs about in the middle of the passage, and sets off the varied grey of the picture with the warmth of its colouring. Nor would any

one who comes down to Cambridge to admire Trinity-court or the "Backs" of the Colleges, think of paying a visit to the Falcon-yard in the Petty Cury (see lithographed sketches; Fig. 1); and yet the Falcon-yard has its charms. Some slight token of regard might surely be paid to the remnants of old departed coaching glories. What once was a stately hostelry where travellers were put up for the night, and where, no doubt, many of the mothers of bygone undergraduates used to stay when they visited their sons; what once was surrounded by the bustle that attended the arrival or departure of the mail-coach, or, perhaps, saw the last journey of old Hobson, the carrier, ere Milton hitched him into rhyme, is now a rickety building enclosing an uneven yard, where the descendants of the "men of old" hang up their clothes to dry, and a broken cart or so takes the place of the gay stage-coach. The balcony, with its cracked yellow plaster and its quaint columns of carved wood, is now a storage for old boxes, while the spacious rooms are let out to various little tradesmen, whose sign-boards, if they do not add insult, certainly add picturesqueness to injury.

There is a common saying which describes Oxford as a University within a town, Cambridge as a town within a University. With regard to the latter, however, apart from its academical portions, the town possesses numerous beauties that would do it credit, even if it had not all the additional glories of colleges, chapels, and halls. Where university and town buildings are united together the effect is particularly impressive. Let us review first such of the corners of Cambridge as have nothing to do with the actual university, though, if an occasional spire peeps over the top, or the portion of an old college gate casts its shadow in front, the beauty of the picture will but be increased.

First then, passing by the proud dignity of St. Mary's or the fine open market-place with its graceful fountain, or any of the other more modern or more important charms upon which the good people of Cambridge pride themselves, we come in our search for quaint corners on three old churches, of great interest, St. Sepulchre's, St. Benet's, and St. Peter's. It were almost sacrilege, at least in the eyes of an orthodox architect, to rank the Church of St. Sepulchre amongst "quaint corners," a church which is the oldest of its kind, being one of the four round churches of England. But if we plead that its originality has been spoiled by later renovation; if we declare that we will only apply the epithet "quaint" to its old porch; if we give as an excuse the curious position of the little building, in one of the noisiest and liveliest parts of Cambridge,—then, perhaps, it may be allowed to come under our heading. Situated at the junction of two of the largest thoroughfares of Cambridge, at the back of it the Union Club, in front of it the stately chapel and College of St. John's, it is easily passed over without a glance, its graceful interior is left unheeded, and its strange little windows unadmired. The ancient part of the church is built in a perfect circle, the stones are beautifully cut, and there is a mixture of diminutive massiveness and grace which make the whole very pleasing; the porch is the best portion of it, being a fine Early Norman semicircular arch, with a curious zigzag ornament among its mouldings.

A visit to St. Peter's Church takes us across Magdalen Bridge to the other side of the town, and into that part where, long before the University was founded, stood the old borough of Grantbridge, and where we may see the little Church of St. Peter, built close to the mound on which William the Conqueror erected his castle when he subdued the Fen lands. The surroundings of the place are historically most interesting; not only do they mark the early position of the Anglo-Saxon town, but the still earlier site of the Roman *Camboritum*, and the Roman stones and bricks may yet be seen in the walls of the old church, a portion of which was built long ago with the remnants of that earlier civilisation which the English conquest destroyed. The appearance of the building is most strange; it looks like a little square box built of rubble stones and bricks, with a curiously-fashioned porch, and windows placed here and there, and a lid upon the top to represent a roof; at the end of the box is a little tower with a modern steeple, the whole mixture giving the impression of what a child would build with a heap of bricks.

The last of our three churches, St. Benedict's, is one of those buildings for which one can feel a sort of child-like affection. "The ancient tower of St. Benedict, the most venerable monument of Cambridge," as Freeman calls it, has stood for 1,000 years, and seen the town and the University grow old around it. Bolstered up on either side by later additions of doubtful architecture (Fig. 3), it stands in a gloomy churchyard now sunken below the level of the street; and on Sundays still gives forth those undaunted peals, which have been the bane of many a frenzied student, and well harmonise with the inscription on the sixth and most terrible of its bells,—

"John Draper made me, in 1618, as plainly doth appear, This bell was broke and cast againe, wth tyme church-wardens were,
Edward Dixon for the one, who stode close to his tacklyn,
And he that was his partner then was Alexander Jacklyn."

Which shows us not only that even in those days St. Benedict was in the habit of cracking his bells, but that a good Browningesque rhyme was also not uncommon. The south end of the church is connected to what is now a part of the kitchen of Corpus College; the two portions being joined by an old archway of stone and brick. (Fig. 4) over which are built some odd little rooms. There are strange and various monuments in the churchyard beneath, with inscriptions that evince a marvellous subtlety for morose rhyming; grass and shrubs grow among the tombs, and add life to the sombre variety of deep red bricks and gloomy stones, of which the whole body of the church is composed.

This ancient place is surrounded by pretty bits. Free School-lane (Fig. 2), which runs along the side of St. Benet's, is the most picturesque street in Cambridge. Passing to the end of the lane, and looking up it, we see the Chapel of Corpus on our left, with a wall overgrown with ivy alongside of it; a little higher on the right are two quaint old gabled houses, with low red brick roofs and projecting windows; then, moving a little farther up, we see the entrance to Corpus Kitchen, and a low building, once an old hermitage, over the pointed windows of which rise, in the distance, the glorious spires of King's Chapel; while still a little further on are to be seen the sombre buttresses and bricks, the quaint chimneys and crosses, of the church we have just been describing. Such is Free School-lane; but such it is not destined to be much longer; one by one its antique houses are being pulled down, and two of the most charming that still remain are doomed within the year to make way for contemplated extension of the University Laboratory.

Running into Free School-lane is another little street which commemorates the name of another forgotten saint,—St. Botolph, or, as he is vulgarly called, "Bottles." His church has nothing of any surpassing interest about it, but by its position further adds to the air of content and blissful repose which lies upon this delightful portion of the town. The lane that runs alongside is another picturesque bit. In the distance is the tower of the Pitt Press; in front a string of low and irregular houses, which almost merit the ancient title that long years ago was bestowed upon them owing to the poverty of the inhabitants,—Penny Farthing-lane; and so on all over Cambridge are there little odds and ends, quaint bits of houses and walls, tortuous streets and blind alleys, which, even apart from their connexion with the University, are more than enough to warm the heart of the mustiest old antiquary. For quaintness there are few houses in English towns of the present day that could match with the antique buildings in the Petty Cury, or the brightly-painted little inn in St. Andrew's-street; and as for picturesqueness, though the river Cam has often been reviled, there are many bits like the Newnham Mills or the sight from the town bridge looking on to Mill-lane,—leaving the glories of the backs of the colleges quite out of consideration,—that would contrast favourably with most of England's river towns.

But the chief and most striking characteristic of Cambridge is its religious air. There is hardly a turn of a street where we do not come across a church; hardly a saint in the calendar that has not some sort of representation in this old town of monks. The streets are named with religious names, in a manner that to an outsider would appear to border on profanity. St. Tibb has his row, and St. Edward has his passage, St. Rhadegund her buildings and St. Botolph his lane. And on Sunday, when all

the bells are pealing, or when the streets are silent and trafficless, the impression produced is one of calmness and peace. It is in the churches and their old memorials, in the graveyards with their tombstones that bear the inscriptions of bygone times, in the old nomenclature of streets and ruined corners, that we learn the true history of a town and the feelings and life of its various ages. And Cambridge, above all other towns, can show us these recollections of the past. We read in an old nook the history of a saint; we read on an old tombstone the record of a forgotten life; we hear in an old name the echo of an unremembered story; and we feel in the old town that we are learning the deeper significance of the lessons of history, when we see how each life, each building, each age, each reminiscence, has been gathered to the records of the past.

But such thoughts are gloomy; let us regard the old town from its brighter side; let us look at it as the University, the seat of learning, the "Alma mater."*

TWO CITIES.

THE interest generally expressed in the proposed changes in the Municipal Government of London has not been entirely confined, as might be imagined, to this country. True, public interest cannot be said to have been roused on the Continent by the ministerial announcements which of late have disturbed so seriously the equanimity of the City Conscript Fathers; but those who abroad watch the currents of modern thought have not been slow to perceive the significance of a step, the discussion of which involves the consideration of so many interests, and recalls to the world at large the singular story of the growth of the vastest conglomeration of human beings ever gathered together, a city beside which Babylon and Rome, with all their grandeur, stand but in the second rank; "a great sea," as Shelley truly said of it, "whose ebb and flow at once is deep and low."

On the Continent, where a general spirit of State "interference," as we would term it, directs, and long has directed, the formation of most of the great capital, the growth of London, under conditions so widely different, has, now that the question is drawn attention to, attracted among the thoughtful no small notice as bearing on one of the many phases of our modern civilisation. Here, within a few hours' distance of each other, have steadily grown up, from almost comparative obscurity,† two huge cities, the united population of which amounts to over seven millions; with all that such figures mean when it is remembered that on the banks of the Thames and on those of the Seine are gathered the wealth, the intelligence, and the power of two great nations. That the English metropolis should be the creation of a system in great part free from the centralised and parental form of administration to which Paris owes its modern existence, is a feature certainly calculated to arouse reflection; for, while we on our side of the Channel are clamouring,—and in all justice let it be remarked,—for a reform in the complicated puzzle of administration by which London is ruled,—a reform which, it is urged, should to some extent be in a centralising direction, in Paris there is a strong desire prevailing to throw off the galling interference of the Government in municipal matters.‡ While we in our country are apt to point across the Channel to the government of Paris, as affording an instance of what a well-organised system of administration can do, a certain section of the Parisian municipal rulers are fond of drawing attention to the grandeur, the wealth, and the power of London as the creation of a purely independent and self-governing system. There is, however, this to be said with regard to the two positions, and the point is one, perhaps, overlooked by French critics, that in the case of Paris the desired reforms are far more political in their tendency than those clamoured for by us, in which, though a political element does to some extent exist, the chief changes required partake of a purely practical, and, let it be added, much-needed nature.

* To be continued.

† Cassin makes no mention of London; Tacitus no reference to Paris.
‡ Among other features, this interference can be understood when it is remembered that both the Prefect of the Seine and the Prefect of Police are appointed, not by the municipality, but by the Ministry in office.

As a sketch of the general management, some might use a harder word,—of our metropolis, an article recently devoted to the subject of London Municipal Government by the *Nouvelle Revue* will, we think, serve perhaps to show our neighbours,—among whom, at present, a very strong Anglo-mania has set in,—something of the mysteriously complicated mechanism under which London and its daily-growing suburbs are governed. To a people like the French, logical above all things and masters of organisation, the puzzle of our much-boasted system of self-government must and does seem strange, and still stranger that, in spite of such manifest disadvantages as those under which we suffer, our metropolis should have succeeded in developing itself to such an extent. It may frankly be admitted that the puzzle appears as great to many at home. "Such a mechanism, so complicated, so strange, so chaotic can," remarks the writer, "only be understood by taking into account the English character. The English are not slaves of symmetry. Faithful to their old traditions, attached to their customs, proud of their institutions, they are far from fond of incessant changes, which, while they benefit the present and prepare the future, demolish to some extent, it must be admitted, the past. Conservative in everything, and yet reformers, they repair, patch up, and provide for the needs of the moment. They prefer to prop up a secular edifice rather than erect a new one, however admirably it may be planned. The multiplicity of various and unconnected, often conflicting,—departments, fatigues them no more in their administrative organisation than the inextricable confusion of customs and laws which constitute their judicial system. The metropolis offers therefore a singular series of contrasts. It may be looked on as the most modern city in Europe; from many points of view it affords the best idea of the progress accomplished by modern civilisation in the administration of great human agglomerations, while, at the same time, it is the centre in which have been preserved with the most persistence the traditions, the institutions, the customs of the Middle Ages."

No city in the world therefore so much as London,—the great commercial centre of the globe,—can be said to offer so vast a field for the study of those great problems which are inherent to all huge gatherings of human beings.

It is satisfactory to find it admitted that at least in the great question of hygiene London is not so ill off as might be imagined. Paris, certainly, in spite of its undoubtedly superior above-ground cleanliness, cannot boast a lower proportionate death-rate than London. In the first place the population is far more crowded on the banks of the Seine,* the lower rate of mortality in London being attributed by the writer in the *Nouvelle Revue*, not only to the nature of the soil and the abundance of the food, but to the physical strength and moral power of our population, and the admirable working of the general hygienic services. Certainly it must be admitted that in the matter of drainage London stands far ahead of Paris, where the prevalence of typhoid fever is directly traceable to the barbarous cesspool system, which, however, every fresh effort of the municipality is tending to sweep away. On the other hand, while we are on this subject, can it be denied that by our system we, in our country, lose annually a vast amount of invaluable fertilising agents?

Our organisation of poor relief has been often criticised, its very efficiency being urged against it as an incentive to poverty, and destructive of the spirit of thrift. It must be allowed that in our metropolis poverty assumes a terribly squalid aspect, which offers its hideous contrasts in our streets side by side with an excess of wealth and luxury which, to the moralist, is only, perhaps, even more heartrending. This mixture of squalor and comfort, of luxury and misery, never fails to impress most painfully the foreigner who visits London; it is indeed a feature which, it must be freely conceded, places a sad blot on the fairness of our great city as compared with Paris, where the misery

has to be positively sought out to be discovered by the stranger. "From the action of the climate, from the influence of the poor laws," remarks the writer, "from the aristocratic character of English society, poverty is synonymous in England, and especially in London, with misery. In this century of wealth the poor man feels himself an outcast. The poor of London are more despairing than those of Paris, and, therefore, more degraded. They accept their lot with an immutable resignation, and their fate is thenceforth irremediable. There are, in reality, less poor in London than in Paris, yet the misery appears greater." Comparing these remarks, so just in their tenor, with the utterances of Professor Huxley some months back as to the positively awesome ignorance and degradation of many of the poor in the East End of London, who can deny that we have here a problem which it will indeed need all the energy of a reformed system of municipal government to remedy?

All who make themselves familiar with the working of our numerous building societies admit their beneficial influence on what have been so well termed as the dependent classes, and it is pleasant to see the labours of benefactors, such as Miss Octavia Hill, among many others, freely acknowledged by our Parisian contemporary.

The picture drawn is, it will be seen, not one of the violent criticisms such as of late we have been accustomed to hear from the further side of the Channel. The tone of the article would indeed seem to be one in favour of the existing state of affairs,—on the score of the wonders it has produced,—were it not that the tone is evidently more intended to show to French readers the value of private initiative, self-dependence, and self-government, to which elements we owe the existence of our huge metropolis. It is on these virtues that must depend the fate of the movement to reform, what unquestionably demands reform, in the interests of a population which, before many generations are past, must have doubled its numbers, and whose requirements have entirely changed, and are no longer those of a distant part, a respect for the traditions of which need in no way, as seems so often to be feared, interfere with necessary changes.

We are essentially at one with the French writer in his complaint that perhaps there is too political a tendency in the proposed changes, not sufficient importance being attached to science in the direction of the new order of affairs. The administration of the huge agglomerations of human beings which form the feature of our modern civilisation depends quite as much on science as on politics,—on science combining the varied yet kindred labours of the architect, the engineer, and the hygienist.

A new branch of political, social, and scientific inquiry is, in fact, opened up by the conditions presented, in the great cities of the present day, and which, both in the Old and the New World, are under the centralising and attractive influences of civilisation, daily growing to a size which bids fair to try the competency of any municipal council not specially organised to meet with the emergencies which present themselves in the changed conditions of modern urban and suburban life. In the face, therefore, of such universally-admitted facts, the defeat of the selfishly-interested opponents to municipal reform, is, as with so many other matters, but a question of time.

London Foresters' Asylum.—The seventy-eighth quarterly delegate meeting of this Institution at Bexley Heath, Kent, under the deed of trust, was held last Saturday evening, the 31st ult., at the Foresters' Hall, Clerkenwell-road. Mr. T. H. Bennell, the chairman, presided, and was supported by Mr. J. S. Bareham, trustee, Mr. W. F. Potter, architect, and most of the members of the committee. The committee's report and balance-sheet were unanimously adopted. The value of the different funds was:—Cost of land at Bexley Heath (5½ acres), 1,275l. 7s. 9d.; cost of houses thereon, 1,520l. 8s. 6d. The general and endowment funds amounted to 1,152l. 15s. 6d., making a total value of 3,949l. 1s. 6d. It was announced that the Foresters' great day at the Crystal Palace would be on August 26th next. An illustration and description of this asylum appeared in the *Builder*, March 28th, 1874.

THE DWELLINGS OF THE POOR.

HEALTH EXHIBITION CONFERENCES.

THE first of a series of Conferences, under the auspices of the Mansion House Council on the "Dwellings of the Poor," was held at the International Health Exhibition, in the Arena of the Albert Hall, on Wednesday afternoon, under the presidency of the Lord Mayor. Papers were read by Mr. C. B. Longstaffe, M.A., M.B., F.S.S., on "The Population of London, and its Migrations"; by Miss Gertrude Toynbee, on "The Treatment of the London Poor"; and by the Rev. A. Mearns, on "Overcrowding."

The Lord Mayor, in opening the proceedings, thanked the authorities of the Exhibition for having given the opportunity of discussing these very important questions.

Mr. Longstaffe then read his paper entitled "The Population of London, and its Migrations," and at the commencement said the Conference had been summoned to discuss the Housing of the Poor. The houses existed for the people, not the people for the houses, and the exceeding numbers of the one caused the special difficulty of the other. London was not yet grown up; it was still growing at the rate of 56,000 a year, 1,000 a week, 150 a day. The growth of a population was made up of two factors: (1) the natural increase of the people, and (2) migration. The population of London as a whole increased considerably faster than the excess of births over deaths would account for, i.e., there was extensive immigration. On the other hand, the number of Londoners who were also London born did not grow nearly so fast as would result from natural increase left to itself; therefore, there must be considerable emigration from London; using the word in a general sense, and not necessarily implying a long sea voyage. There was no direct means of ascertaining how many out of the four millions of Londoners could be rightly called *p-o-o-r*, meaning those who were constantly, or at frequently recurring intervals, in absolute want of food and clothing. Nevertheless, from the indications afforded of the extent of this distress by the census, they would be justified in saying that the very poor could not number less than 100,000, some 50,000 being the inmates of public institutions. There must, however, be a much larger number but a very little removed from this class. He would leave to others the task of describing schemes to improve the dwellings of the toiling myriads of the metropolis, but he confessed to being a disciple of Queen Elizabeth in the wish that something should be done, if not to diminish the number of inhabitants, at least to prevent their increase. But one remedy seemed at all practicable—emigration; but they must beware of aiding emigration from London itself to any great extent, because for every family sent to Canada from Whitechapel or Poplar, two families would rush in from Norfolk or Devon, and even from Ireland. Some 200 persons come in from the country, to settle in London, every week. He suggested that these people should be stopped *en route*, and shipped off to the Antipodes. These countrymen would make far better emigrants than townsmen. They should do all they could to discourage immigration into large towns, and tell Hodge that if he was dissatisfied with his own parish, he would do best to cross the sea.

The Lord Mayor observed that he concurred in the remark that it was better for country labourers to go out to the Colonies than Londoners, because the former had a knowledge of agricultural work, and could labour in the fields, which London labourers did not understand.

Canon Gregory said the most puzzling of all questions was the housing of the people. In Tottenham, Edmonton, and other places, there was a large proportion of houses unoccupied, and the obvious inference was that the people were tied to London by occupation, or were unable to go out to the suburbs through inability to pay the rents. The great problem of the day was how were they to house the poor? They could not be housed in the centre of London, and if they were to be sent to the suburban districts, who was to pay the rent?

Mr. Thomas Harriott remarked that there was no problem at all; it was the simplest matter. What was wanted to prevent the overcrowding of the great cities was to make the poor attached to their native villages. Food was required, and the people in the country were not taught to produce it. They required

* In Paris, a walled city,—some 2,300,000 inhabitants are packed together in a space of some 7,800 hectares; in London, 3,800,000 are spread over 35,500 hectares, or 5,000,000 over 176,500 hectares. In Paris, each inhabitant enjoys some 34 metres; in London, 80 metres in the inner circle, 350 in the outer. In Paris, of course, it must be remembered living in high houses laid out in "dais" is universal. The hectare is equal to 2½ acs.

educating, and thus rendered fit for their occupations. Their cottages should be made comfortable, and the people taught various industries. There was now a system of national education. Why should not all industries be dignified? Why should not all industries be dignified? Country districts should be made as attractive as London, and this would stop overcrowding.

The Lord Mayor here left the hall, and the chair was taken by Mr. Samuelson, M.P.

Miss Gertrude Toynbee's paper on "The Treatment of the London Poor" was next read. Miss Toynbee did not dwell on any special branch of work for the poor, but rather on the ideal aim of all such work. She drew a melancholy picture of the discomforts in a house of 30 or 40 occupants, in which scarcely a family had more than a single room, and nearly every family consisted of father, mother, and several children. Was it not a mockery to talk of the "homes" of the London poor? People who lived thus had no homes, and yet for the accommodation of a single room they had to pay as much as 5s. a week. They might do their best by means of sanitary aid committees to get such houses kept in a decent state; but they could never make them into homes. And just because they could not do this, they must do their best to give the London poor a *sense of home*, as it were, in spite of their want of homes. Pleasant social intercourse, quiet, refreshing hours, bright and beautiful surroundings—all the blessings their own homes brought them—they must try and procure for the poor. They had talked much of the dwellings of the poor lately, and Local Sanitary Aid Committees had been formed by the Mansion House Council. Already they had seen tangible results of their work in the way of sanitary improvements in the dwellings; and they had every reason to hope that the continuous action of these Committees would before long create a far higher standard of sanitary requirements for these dwellings than had existed hitherto. But do not let them stop there. Let them try and feel the full pathos of those words they had heard so often—"the Dwellings of the Poor." Let them, at any rate, give the children some pure and bright experiences which should help to obliterate the evil ones in their minds. They could send them to stay for a few weeks in the country; they could take them to play in the parks; they could get the Board Schools opened as play-rooms for them in the holidays. For the young men and women they could provide social clubs; for old and young they should seek to provide pure recreation for leisure hours in the week and on Sundays, so that they might be in some measure compensated for the homelessness of their dwellings.

Rev. A. Mearns, in the course of his paper on "Overcrowding," pointed out that what was meant by the term was too many people living in a room or house, but the houses might be so placed as not to provide for due ventilation, and wherever that was the case it must be regarded as overcrowding also. The urban average of England was six people to an acre, but places could be found where there were from 600 to 1,000 to the acre. There were, however, other circumstances that must be taken into account, for it was quite possible to have the larger number in the space indicated without any overcrowding injurious to health. One cause of overcrowding was the carrying out of Public Improvements. 22,000 persons had been compelled to leave their dwellings under the powers of the Artisans' Dwellings Acts. Accommodation had been provided for 14,000 of these. Where, meanwhile, were the 8,000? The same causes were at work elsewhere with similar results. High rents was another cause. The amount that could be spared out of a labourer's earnings was not sufficient to pay for two rooms. Where he had to rent a furnished room at 5s. or 6s. a week he sometimes took in lodgers at so much a night. Overcrowding was closely related to intemperance, both as a cause and an effect. The necessity of some living near their work,—taking those who had to attend Covent Garden and other early markets, and water-side and dock labourers, as illustrations,—was a further cause. As regarded the effects of overcrowding, physically they were a fertile source of disease, and morally they were fearful to contemplate. Remedies for the evil were to be found in the registration and inspection of all property let out in single rooms, the registra-

tion to include information as to the owner and the number of persons accommodated; and in the erection of artisans' dwellings. If freeholds could be secured, it would be in the interest of the owners to put up houses that would last, and keep them in thorough repair. If freehold plots could be secured, surely companies could be formed which should pay at least 3 per cent. dividend. Miss Octavia Hill warmly advocated the formation of such companies, and it was well known that lady had now under her supervision blocks of houses, which proved the possibility of doing much for the poor in that direction.

Mr. Hepple Hall expressed the opinion that while one-third or one-fourth of the Metropolitan population was constantly coming from Manchester, Liverpool, and other parts of the country, no substantial relief could be found except in emigration.

Mr. F. King remarked that the fact of there being such a large quantity of land uncultivated in this country while they were constantly sending out their gold for the purchase of food, was a national disgrace. He was opposed to emigration. It should be shown to the people that it was to their interests to keep to their own towns and villages. The remedy for the overcrowding of London and other cities was in their own hands. The land should be cultivated, cottages for agricultural labourers should be built, and the people taught how to produce food for the nation.

Mr. T. Hunter, a working man, said the principal cause of overcrowding and poverty was the public-house. They should try to teach the working man to be independent, and not patronise him too much. Great good would, however, be done by providing him with recreation.

The Rev. G. W. McCree also spoke of his experience in St. Giles', where he found intemperance was a chief cause of overcrowding.

Rev. A. Styleman Herring was of opinion that overcrowding could not be stopped except by very stringent laws. He thought they should do all they could to assist emigrants going out to the colonies.

Mr. Anderson was in favour of providing the working classes with ample means of recreation.

The Chairman, in some concluding remarks, expressed his gratification at finding ladies taking a prominent part in the solution of these problems.

The proceedings terminated with a vote of thanks to the Chairman, proposed by Mr. Hunter, and seconded by Mr. Blomfield.

ANGLO-SAXON CASKET, BRITISH MUSEUM.

WE give this week the other two subjects from this curious carved relic of Anglo-Saxon art, which was the main illustration of Mr. Hodgkin's lecture on the casket. His remarks on these two subjects are as follow:—

"The second scene in the casket represents the attack on Jerusalem by Titus, a 'vision of judgment' further explained by the word *DOM* or *Doom*—judgment, and a man carried off to prison, who is explained by Runic writing to be a *OSSET* or hostage. There is a theory to which I cannot subscribe, that these two scenes make up in a reborn the name of the maker, but this is not a likely name for an Anglo-Saxon. *Domgæst* would not be suggestive of anything which would occur to the Anglo-Saxon mind. *Gæst*, on the contrary, would mean something, or might have meant something if it had ever been used, of which there are no proofs. It would indicate the state of hostage-ship, or the being a hostage; but there is nothing in the picture beyond the judgment scene and the man going to prison to warrant such a construction. The Runic inscription is very strangely mixed up with ecclesiastical Roman letters. The whole reads:—*HER FEGTATH TITUS END GÆSTHROD. HIC PUGNANT IERUSALIM AVITATORES* (habitatores). 'Here fight Titus and the Jews; here fly the inhabitants of Jerusalem.'

On the cover is the representation of a warrior in a house which is attacked by other warriors in Anglo-Saxon armour, and armed with Anglo-Saxon (or rather English) weapons. The name of the warrior is *Egil* or *Egil*, and the description of the casket refers the public to the *Egil's Saga*, and the Paleogeographical Society takes notice of the scene as referring to the warrior named *Egil*. Now the *Egil's*

Saga is a terribly long story relating to events occurring in the ninth and tenth centuries, so that the actual date of the manufacture of the casket must be quite late in the tenth or the beginning of the eleventh century, which would agree with the representation of the arms and armour. The helmet of the warrior attacking *Egil* is such as we meet with in the Norman times, while the representation of chain mail by large contiguous rings is quite a feature of the eleventh century.

To give you the *Egil's Saga* even in abstract I find quite impossible. The story itself occupies a thick folio volume. *Egil* is identified with English history by a visit which he paid to King Athelstan, during which he became famous for valorous deeds. But the scene on the casket represents his being besieged in a house on an island to which he had escaped from his enemies, but he was taken and bound to a log of wood hands and feet, and left in the house while his captors find means for conveying him to the court of Harold Hærfagra. By his extreme strength he contrives to get free from the log, and with it force a hole in the floor, because he heard human voices below. These turn out to be the voices of a Dane and his two sons imprisoned. They have been cast into a cellar below and cannot escape, but *Egil* releases them; and here the *saga* is a little indistinct, but I gather that they promise to protect him from his foes while he goes aloft. The casket shows him, with the log in his hand, in the *loft*, and the Bowman is the Dane. The attacking warriors are most instructive as to dress and arms, but they are all much later than the date assigned; the events recorded in the *saga* are conscientiously dated 881 to 951, therefore the casket, if representing a scene in that legend, cannot be older than the tenth century. The manner in which the bow is held by the Bowman shows a curious mode of holding the weapon, differing from any other with which I am acquainted. The ordinary belief is that the Saxons drew the bow to the breast, while the Normans drew theirs to the ear, whereby they obtained such immense superiority. This fellow draws his to the hip, which is perfectly new to me."

HOUSES, ANSON-ROAD.

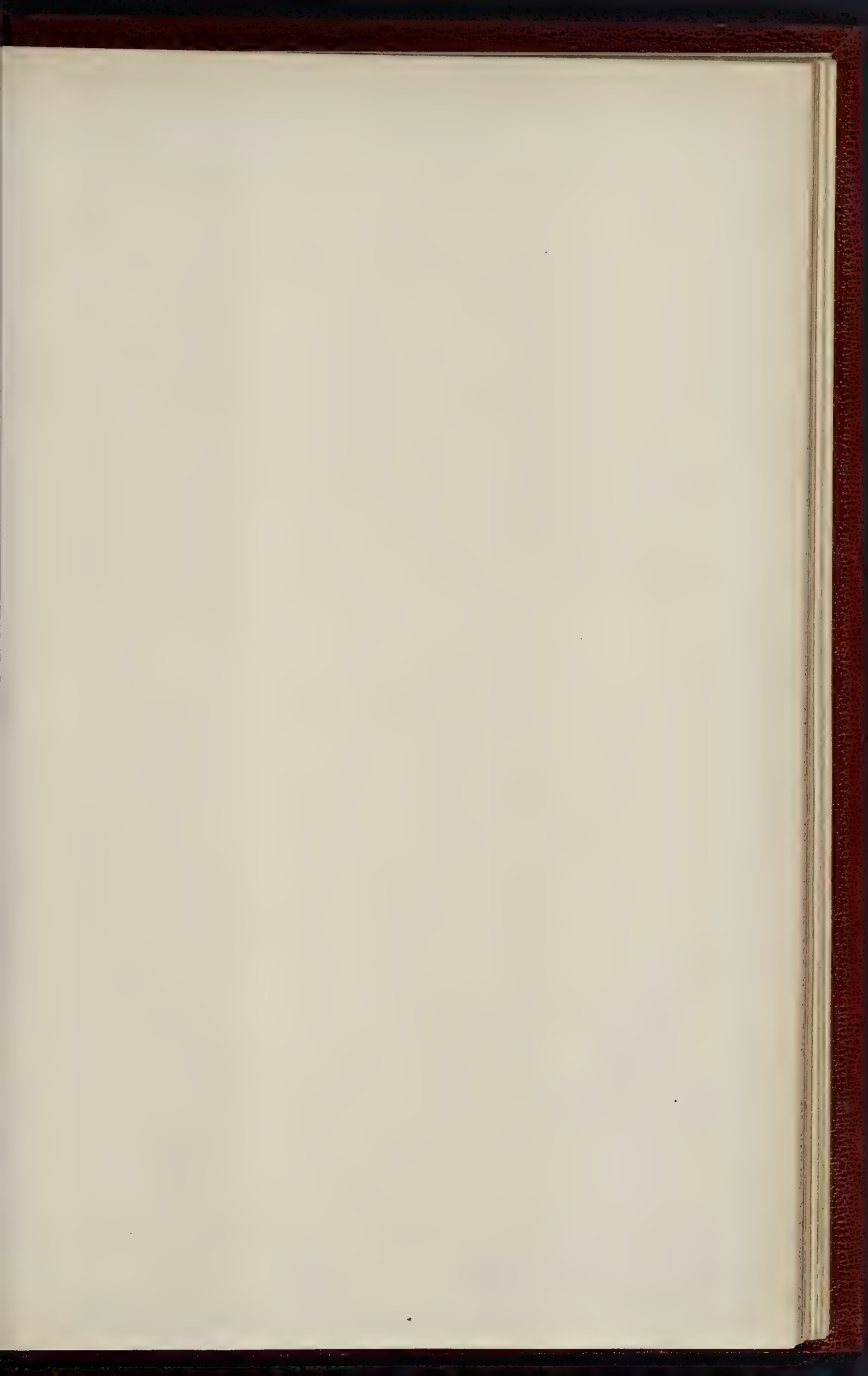
THESE houses, which are on a building estate in the north district of London, represent a praiseworthy attempt to build houses of their class with some variety of architectural detail, instead of the eternal repetition of the speculating builders' line of "villas," and to construct them with all proper regard to sanitary requirements. The sanitary arrangements are being carried out by Mr. Richard Crittall, and the houses are being erected from the designs and under the superintendence of Mr. J. J. Connelly, architect. The bricks are supplied by Messrs. Rydon and Messrs. Rosher; the lime and cement by Messrs. Lee & Son; the joinery by Messrs. Andrews & Sons; the slating by Messrs. Lewis Williams & Co.; and the general finishing is being done by Messrs. Wilkinson Brothers.

APARTMENT HOUSE, WILHELMSTRASSE, BERLIN.

WE have called this an "Apartment House," as the best general designation; it is, in fact, a grouping of several residences of some importance into one architectural design. The building stands in an important situation in Berlin: the nearest angle, on the left of the view, nearly faces the Kaiser-Hof. This left-hand portion of the building was the residence of the late Councillor Borsig. The sumptuous triple portal in the centre gives access to the palace of the Prince of Pless, and the portion stretching away to the right of that is an Apartment House in the usual sense.

The architect was the late Herr Lucae, of Berlin. The building is not quite a new one, though belonging to the recent buildings of Berlin: we give it as a good example of the effect which may be obtained by a broad contrast of light and shadow, of wall space and arcade, even in a somewhat cold and formal Classical building. It is engraved by Mr. J. D. Cooper from a photograph.

For information in regard to the architect and the arrangement of the building we are indebted to the kindness of Herr Zellner, architect, of Berlin.





corner in the falcon yard

(1)



FREE SCHOOL LANE.

(2)

"QUAINT CORNERS OF CAMBRIDGE" No. I
(see article.)



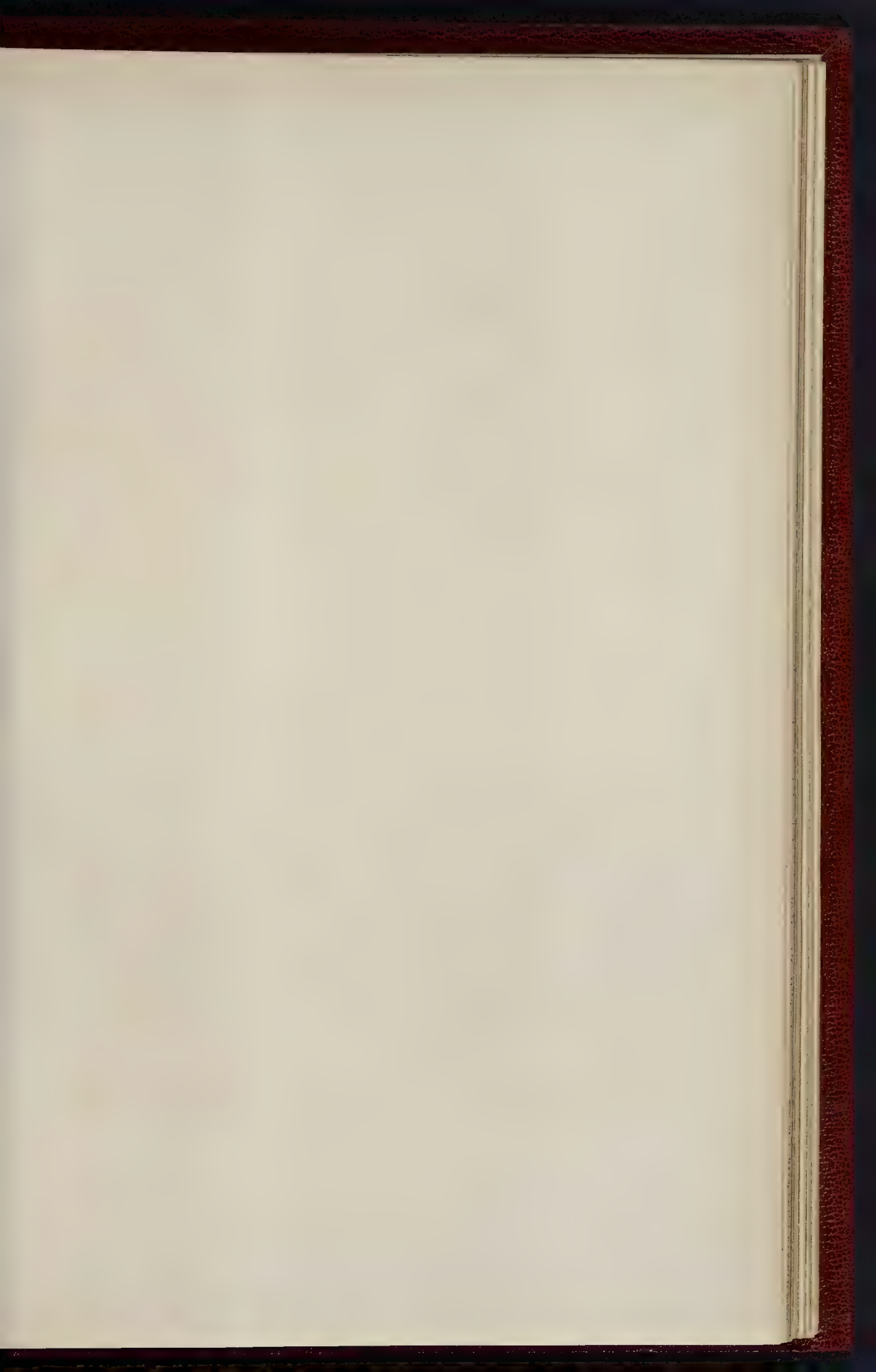
St. Benet's Church
from School Lane

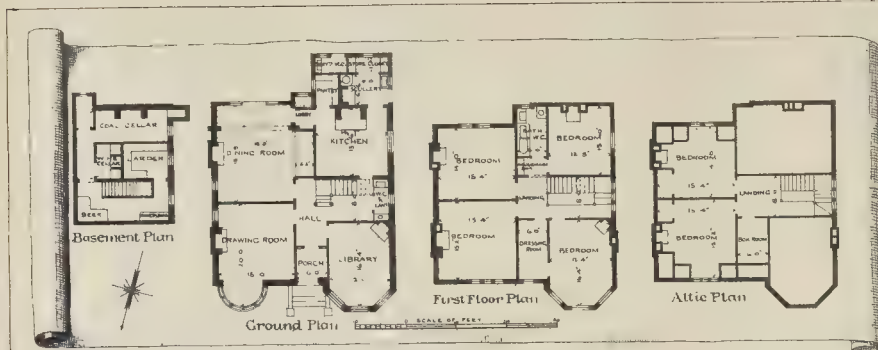
(3)



Old Archway
to St. Benet's Churchyard

(4)





Wynne & Co. Photo Litho

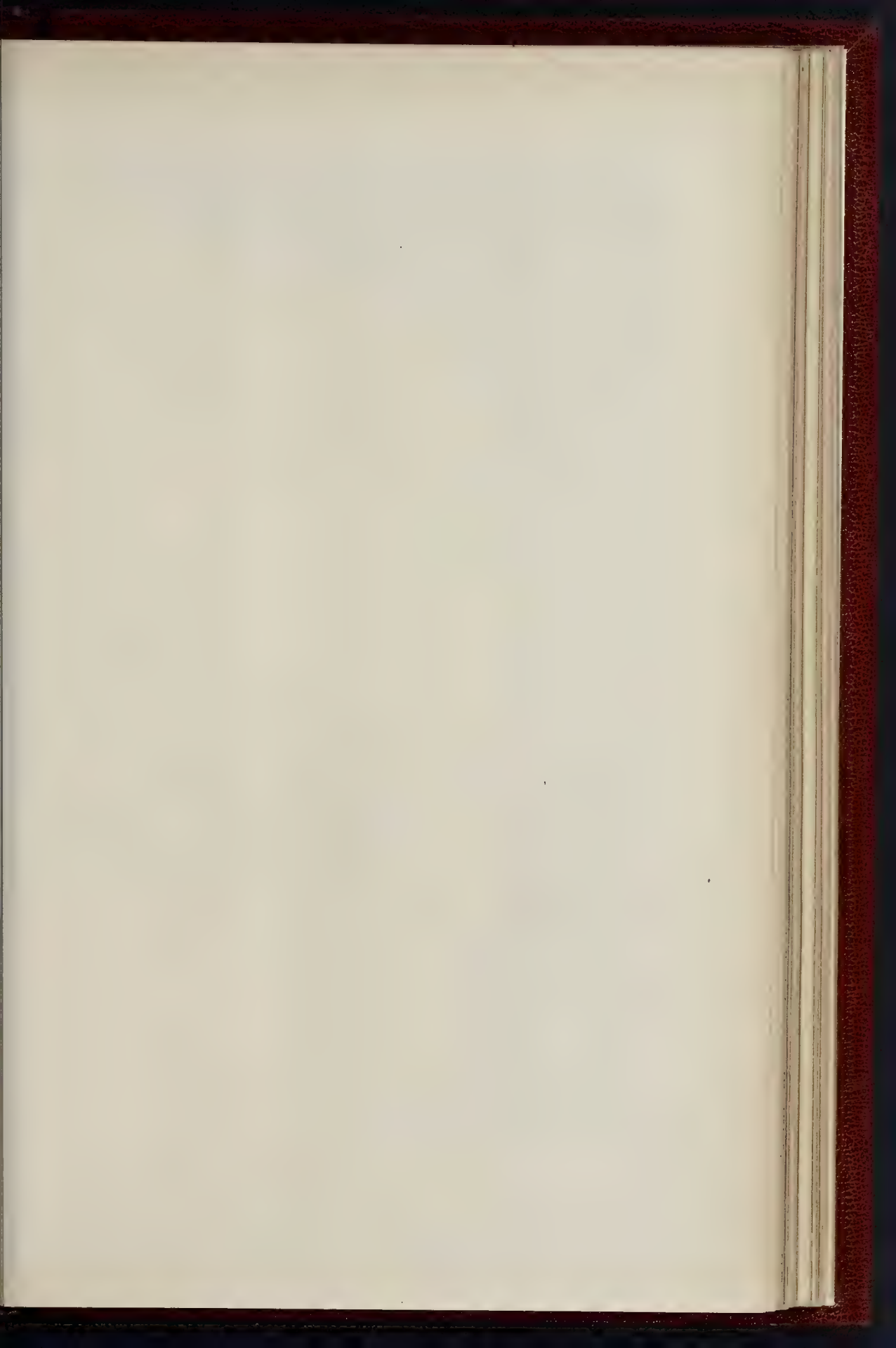
Detached Double Fronted Houses

ANSON ROAD, LONDON N.

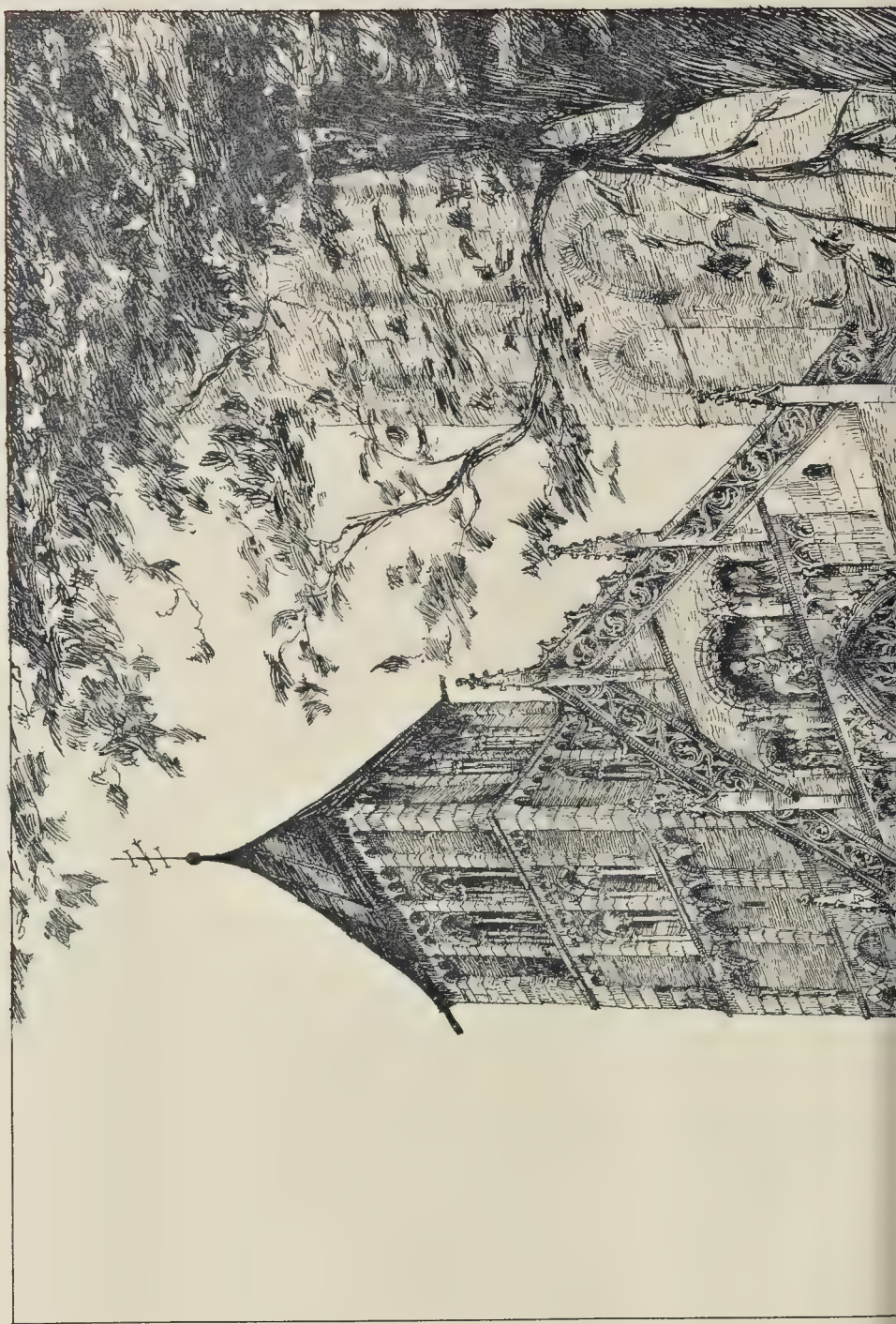
John Joseph Connelly, ARC^{ITE}

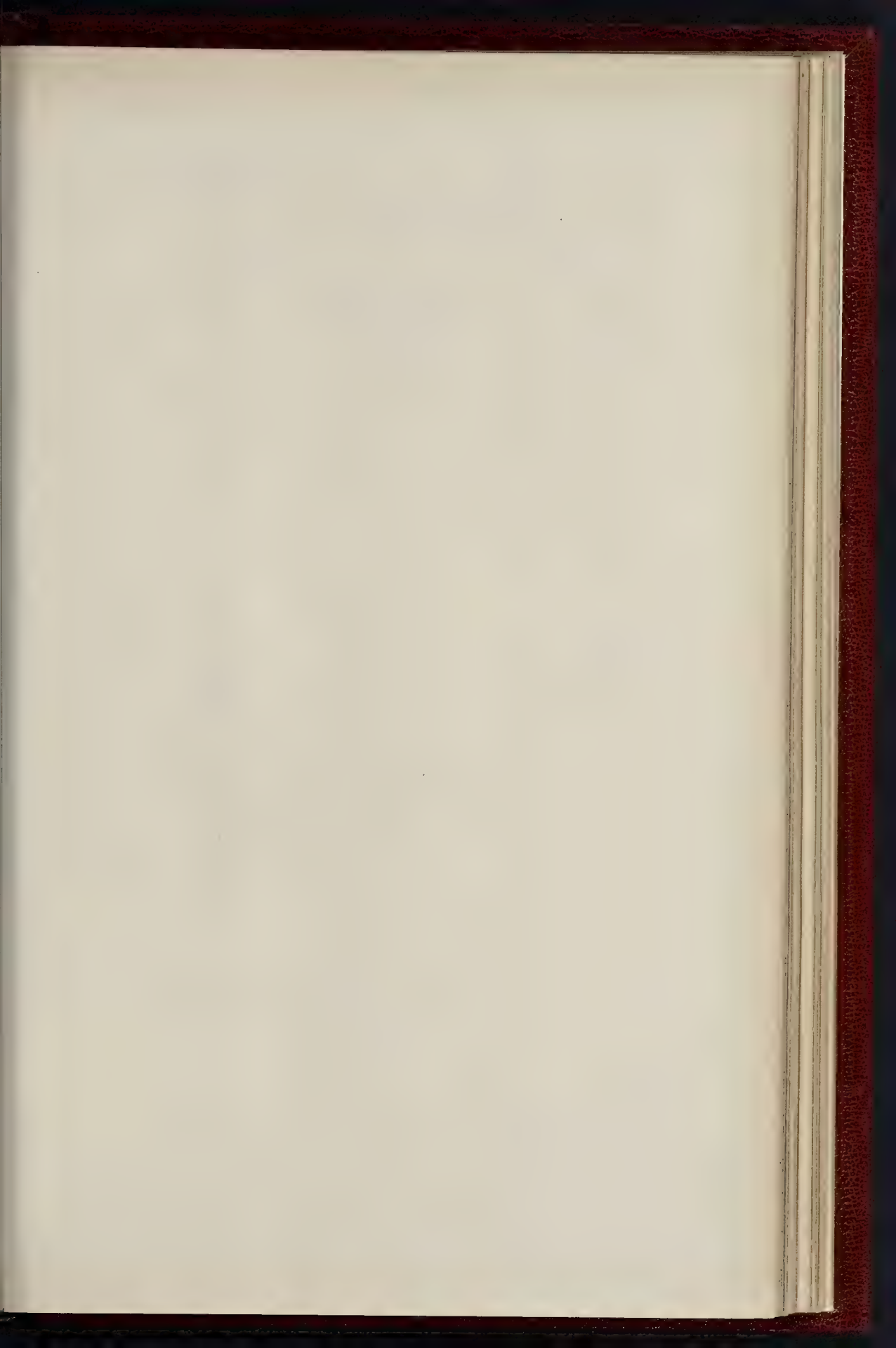


O'Queen St London W.C.



THE BUILDER, JUNE 7, 1884.







APARTMENT HOUSE,

THE LATE PRO

17, 1884.



STRASSE, BERLIN.

ARCHITECT.



PANEL IN
THE LID.

FROM THE LEGEND OF EGIL.



THE TAKING OF JERUSALEM.

THE ANGLO-SAXON CASKET IN THE BRITISH MUSEUM.
(see Professor Hodgkin's lecture)

THE WEST FRONT OF MÜNSTER
CATHEDRAL, WESTPHALIA.

Two Romanesque towers flank the western end of the nave, the early age of which is concealed by the later Gothic insertions and decoration. These have been designed with a careful regard for the success of the whole front,—a regard which is found in very few Medieval buildings,—the harmony of the whole having been nearly always left for time and chance to effect; the architects were bent on making their own mark, and attracting attention to their work at the expense of all that their predecessors had done. This in a measure accounts for the curious fact that architectural advance in the Middle Ages meant simply increase of ornament and complication of forms, and when curved and interlacing lines had had their run, the Perpendicular became predominant in order to produce contrast, and, by the restraint of square lines, to allow of still further indulgence in the now depraved craving for ornament. We need not have said that this was characteristic of architectural progress in the Middle Ages alone, for, indeed, it has been so with all ages and styles, from the intellectual perfection to which the Greeks attained in the age of Pericles, and at which they had the wisdom to stop, down to the insane recklessness of the Rococo in the eighteenth century.

The architect of Münster, in the fourteenth century, had wisdom and sagacity beyond his time. He is to be remembered and honoured for the honour he paid to the work of his forefathers, not for skilful independence of them or for servile copying, but for the value his delicate lace-like tracery and simple masses of their walls below, and for the brotherly way in which his pinnacles carry the vertical lines across his gable from one of their towers to the other. He has, in his care for harmony of design, not forgotten to display the strong points of his own day. The skill with which the figure-sculpture is introduced, and the beautiful designing of parts and features, are characteristic of the higher qualities of late fourteenth-century work, as well as his modest effort to obtain effect by projecting the arch of his porch, and cusing the outer member of the archivolt instead of the inner one; he also added inverted cusps to the upper part of the gable parapet where he is sure that they will be seen against the sky between the towers. There are other points of interest in his work that might be dwelt upon, and, if it is not ungracious, we would draw attention to the way in which he has failed to deal with the broad space which reaches across the gable at its springing. Here he has shown that he lacked, in common with contemporaries, the power of designing space, and this should add to our appreciation of the grace with which throughout the rest of his design he has admitted that others had done what he could not.

A. B. P.

THE METROPOLITAN BOARD OF WORKS
AND LONDON THEATRES.

It appears from the annual report of the Metropolitan Board of Works which has been just issued that the number of theatres in London, within the jurisdiction of the Board, under the Metropolitan Management and Building Acts Amendment Act of 1878, is forty-one. With regard to six of these theatres, namely, the Avenue Theatre, the Comedy Theatre, the Gaiety, the Savoy, Toole's Theatre, and the Vandeville, the Board in the year 1882 intimated to the Lord Chamberlain that they were satisfied as to the construction of these buildings, and that in their opinion the licence in each case might be extended for the full period of twelve months, the Lord Chamberlain having renewed the licences provisionally, from time to time, while the question of the security of these theatres was under the consideration of the Board. In the case of the Court Theatre, Chelsea, which is not under the jurisdiction of the Lord Chamberlain, but is licensed by the Justices of Middlesex, the Board served a notice on the owners to carry out certain structural alterations, and this notice having been substantially complied with, the justices were informed to that effect, and the licence was renewed in due course. As regards two other buildings, namely, Hengler's Circus, Argyle-street, and the Prince of Wales's Theatre in Tottenham-street, they were found on survey to be so

defective as to their structure that the Board informed the Lord Chamberlain that in their opinion no expenditure of a moderate amount would render them safe for the use of the public. The Lord Chamberlain, on receiving this intimation from the Board, refused to renew the licences to these two places of amusement, and they have consequently been closed.

Of the remaining thirty-two theatres the Board has taken action during the past year with regard to twenty-three, namely, Adelphi Theatre, Astley's Theatre, Britannia Theatre, Connaught Theatre, Covent Garden Theatre, Criterion Theatre, Drury-lane Theatre, Elephant and Castle Theatre, Globe Theatre, Haymarket Theatre, Her Majesty's Theatre, Imperial Theatre, Lyceum Theatre, Marylebone Theatre, Olympic Theatre, Opera Comique, Pavilion Theatre, Princess's Theatre, St. George's Hall, St. James's Theatre, Sadler's Wells Theatre, Standard Theatre, and Surrey Theatre.

In the case of thirteen out of these thirty-two theatres, namely, the Adelphi, Britannia, Connaught, Covent Garden, Criterion, Drury Lane, Elephant and Castle, Globe, Haymarket, Lyceum, Olympic, Opera Comique, St. George's Hall, the works required to be done under the Board's notice have been completed, and the licence has in each case been renewed for the full term of twelve months. In regard to the Imperial, the Pavilion, and the Marylebone theatres, the works have been begun, but are not yet completed; the notices with respect to the Surrey Theatre and the Standard Theatre have been the subject of appeal, and notice of appeal has been given with regard to Her Majesty's, St. James's, Sadler's Wells, and the Imperial theatres.

With regard to the Connaught, now called the Holborn Theatre, the Lord Chamberlain having refused to continue the licence for this theatre, the police authorities instituted proceedings against the manager, and the house, which had been opened for a short time under the name of the Alcazar Theatre, was closed on the 16th of January last. A notice was subsequently served on the owners of the theatre, and this notice having been complied with the licence was renewed and the theatre re-opened.

The case of the Criterion Theatre was very exceptional. At the first meeting of the Board in the year 1883 it was resolved to inform the Lord Chamberlain, in reply to a request for an expression of opinion, that it was not necessary to close the theatre pending the consideration of the drawings for proposed alterations then before the Board. The Lord Chamberlain accordingly renewed the licence until the end of March, but on the 20th of January the owners informed the Board that they had determined to close the theatre until they could submit an entirely new set of drawings showing proposed alterations for the approval of the Board. The drawings were submitted and approved by the Board, and very extensive alterations were carried out at a cost of about 10,000*l.*, exclusive of the cost of the installation of the electric light which served about 2,500*l.*

The notice served on the owners of Drury-lane Theatre was the subject of an appeal before Sir H. A. Hunt, the arbitrator appointed by the First Commissioner of Works, who substantially confirmed the Board's requisitions. The works were carried out at a cost of about 1,500*l.* during the run of the pantomime without any interruption of the performances.

The works ordered by the award of the arbitrator in the case of the Lyceum Theatre were completed in July last, and the Lord Chamberlain, on being informed of this fact, renewed the lease for the full term. The works included the completion of the proscenium-wall, a new staircase to the gallery, a new exit from the pit on the north side of the building, and other alterations of a minor description.

The alterations required by the Board to be executed to the Olympic and Opera Comique theatres, and St. George's Hall, were carried out satisfactorily without resort to arbitration. The alterations to the Pavilion Theatre, White-chapel-road, are in progress; and those to the Princess's, St. James's, and Sadler's Wells theatres are under discussion.

The notices served by the Board in respect of the Standard and Surrey theatres were appealed against by the owners of these theatres, and the appeal was heard before Sir Henry A. Hunt, who confirmed the majority of the requisitions of the Board as regards the Standard Theatre. The award in the case of the Surrey Theatre has not been published.

The Board has also taken action under the Act with respect to Canterbury Hall, Egyptian Hall, Piccadilly, Gatti's Music Hall, Westminster Bridge-road, London Pavilion, Queen's Music Hall, Royal Academy of Music, Royal Music Hall, Holborn, Royal Victoria Coffee Palace (formerly the Victoria Theatre), and South London Music Hall. The notices served by the Board were appealed against in the case of the Canterbury Hall, Gatti's Music Hall, Royal Music Hall, and South London Music Hall, and the requisitions confirmed on appeal, with some unimportant modifications. The proprietors of the Royal Academy of Music, on receiving the Board's notice, resolved to discontinue the use of the Concert Room for public performances, and the Board's proceedings came to an end. In the case of the other halls, the works required to be done by the Board were carried out without difficulty.

By the 45th Section of the Board's Various Powers Act, 1882, the Board is empowered to make regulations with regard to the means of exit from theatres. Having regard to the varied requirements of the numerous theatres and music-halls in the metropolis, it was not found practicable to make any general regulations upon this point, but every theatre was surveyed, and regulations made to meet the particular circumstances of each case. The Board, during the past year, made regulations and served notices on the managers of the Lyceum, Drury-lane, and Gaiety theatres.

THE VENTILATION OF METAL-WORKING
AND CHEMICAL ESTABLISHMENTS.

THE approved rules for ventilating factories are subject to certain exceptions when the substances under manipulation have properties calling for special arrangements under this head.

When the powerful Bunsen battery is used for generating the electric current in galvanoplastic operations, the decomposition of nitric acid produces red vapours, which cannot be breathed. Consequently (the *Badische Gewerbe Zeitung* remarks), it is impossible to remain in a small unventilated room where such a battery is in operation. These vapours being heavier than air, can descend from an upper floor to those beneath. An ordinary chimney will carry them away, provided a fire is in it, or even if some jets of gas are lighted in it. If such an arrangement is difficult, ventilation may still be effected in two ways. If the external air is warmer than the air of the room, an upper window can be opened; under contrary circumstances, a communication with the open air must be arranged from the ground. This can only be effected by a vertical appliance connected with an upper window. It must be remembered that air or other gases can with difficulty escape in a lateral direction against the wind, and the use of a chimney reaching to the roof is consequently preferable. The battery should be on the ground, so that the vapours generated should not effect the respiratory organs of workmen under any circumstances. If the battery is situated in a large room it is advisable to enclose the part of it where the battery stands, and ventilate it specially.

The rooms where copper and its alloys are treated with nitric acid should be ventilated in a similar way. Under some circumstances arrangements may be made such as are spoken of later on regarding muriatic acid processes.

If noxious gases are developed in various portions of a large space (as is the case in chemical laboratories) the only efficient ventilation is one by means of which the lower stratum of air is being constantly drawn away by a heated chimney, while fresh air at a slightly higher temperature than that of the apartment is being admitted at as elevated a point as can be arranged.

In the re-tinning of copper ware the copper-smith treats the heated vessels with concentrated muriatic acid. For this purpose it is customary to use a small piece of brick-work, with a place for a charcoal fire. By the action of the heated metal on the muriatic acid large quantities of vapour are developed, which so obscure the air and impede respiration that their prompt removal is necessary. When the operation is carried on in a closed space a chimney-hood should be fixed over the fire, communicating with a chimney leading to the roof. The chimney should be one foot square

to be of effective service. A brickwork chimney is more suitable than a metal one as it exercises a less cooling effect upon the air passing through it and is not liable to injury from the vapours to the influence of which it is exposed. The escape of these vapours is more certain when the fire-place is built into a wall than when it is in a room and open on all sides.

Brass melts at such an elevated temperature that the evaporation of the easily fusible zinc in its composition is unavoidable. The vapours which arise form white opaque clouds of oxide of zinc. If the melted alloy has to be cast, these clouds are very inconvenient to the workmen, and their protracted inhalation is noxious in its results. If the workshop is large and the casting lasts some time, their removal is troublesome. At the moment of their formation they are in heated air and ascend, almost immediately descending when they come into contact with cooler air. Consequently the room should neither be too lofty nor too extensive. When operations have to be carried out on a large scale, a number of small apartments, about 6 ft. 6 in. in height are most suitable. They should be entirely separated from each other. These apartments open at one end into the air and at the other into a chimney of the size of at least a square metre (10½ square feet). During the casting the chimneys must be well heated; and as soon as it has been effected, the door at the other end of the apartment is opened and the draught thus created clears away the vapours generated. The ceilings and walls of these apartments can be made of glass. When a small amount of casting only has to be provided for, similar appliances can be arranged to those already referred to in connexion with copper ware.

ARCHITECTURAL ASSOCIATION.

The last meeting of this Association for the present session took place on Friday, the 30th ult., Mr. Cole A. Adams, president, in the chair.

Mr. R. L. Cox, the librarian of the Association, announced several donations and purchases of books. He intimated that many books had been purchased by means of a grant made by the Class of Construction out of their surplus funds.

The annual dinner was announced to take place, at the Holborn Restaurant, on Friday, the 20th inst., at half-past seven.

The following new members were elected:—Messrs. W. F. Goode, J. A. Ashton, and A. W. Cleaver.

A vote of thanks was accorded to Mr. Jackson for permitting the Association to inspect his house at Kensington Court.

Mr. Charles R. Pink then read a paper entitled "Notes on Heraldry." He commenced by observing that to the general public, and even to artists, the study of the ancient art and science of heraldry, or, more properly speaking, that branch of it known as armory, is an anachronism, if not an absurdity. A learned judge (he rather thought it was Lord Westbury) once heard a case in which the services of an heraldic expert were considered necessary and had been secured. In summing up, the judge referred to the herald as "that silly old man who did not even understand his silly old trade." Some other wise man had defined heraldry as the "science of fools with long memories." These dicta would suffice to show that the subject, once a necessary part of every gentleman's education, had fallen into a low estate in these latter days. Without wasting time, however, in deploring "bad times," the lecturer proceeded to show that a knowledge of heraldry is still a worthy and valuable acquirement, especially for the architect. The study has not been altogether neglected in that room, for he recalled with great pleasure a most excellent paper read there some years ago by Mr. Hummel. On many points he would be contented to allow his remarks to echo Mr. Hummel's. In the first place a knowledge of heraldry was a great, he might almost say an indispensable, aid to antiquarian study and research. Planché called it the "shorthand of history." Especially was it useful in deciding the dates and history of buildings. Our forefathers preferred commemorating themselves and their time upon the structures they raised by the pictorial language furnished by armorial details rather than by the simple use of numerals and lengthy inscriptions. He thought

that, at any rate from a decorative point of view, they adopted the more excellent way.

The Chairman, in opening the discussion, hoped that Mr. Pink's paper would serve to kindle some enthusiasm on the subject of heraldry. It really showed how many things an architect should know something of; but a study like heraldry should not be taken up on the mere strength of reading a small manual and then imagining that they could design. Mr. Pink would no doubt tell them that to design correctly in heraldry required most patient study of the old examples, rather than of books on the subject. Heraldry, which though now-a-days almost a dead art, at one time spoke as a living voice. In Heraldry, as in other matters, "a little knowledge was a dangerous thing," and therefore architects should be careful in their use of it. He had been struck, in looking over the splendid works of the German Renaissance, with the luxuriance of the armorial bearings introduced in the latter part of the sixteenth and middle of the seventeenth centuries. The way in which this was blended with the architecture added an extraordinary interest to the works of the period, and heraldry seemed then to have reached its culmination. It might not be so pure as in earlier times, but there was a freedom and a kind of rejoicing in its strength, especially in the old German towns. Mr. Pink had not referred to the hatchments which were put up before houses and in churches on the occasion of a death.

Mr. Stannus said that to those who had to do with the more ornamental side of buildings, a shield was often a real Godsend. Figure decoration could not be always used, and if a shield or two could be introduced here and there, it gave storiator to the fabric, in addition to being a record of the date and owner. He had been much struck by the quotation that "heraldry was the shorthand of history." The mantle was exceedingly useful from a decorative point of view, especially in fitting the helmet into the panel in which it was introduced. With regard to the motto, in early times a man might change this as often as he chose, but later on the motto became crystallised. The Rebns question was a large one, and he would only refer to the very interesting book by Paulus Jovius, who was well known for inventing badges and rebuses. The Guildhall Library contained a book with the coats of arms and portraits of the Lord Mayors from the earliest times, the contrast between the heraldry of two or three centuries ago and the "modern original muck" being very great indeed. The late work was really like coach-painters' heraldry. Mr. Stannus concluded by proposing a vote of thanks to the lecturer.

Mr. J. A. Gotch said he had always found heraldry a most interesting study; but, in order to deal satisfactorily with the subject, it was essential to go to the fountain-head. Once this was mastered, they would be able to treat it as the mediæval artists did. People now-a-days laid down certain rules by which proficiency in every particular subject was said to be attained, but this, in too many cases, cramped and confined the student. There was an idea prevalent that the simpler the charges were, the more excellent were the shields; but he was told that this was only a general rule, and that the excellence of a shield depended not on its simplicity, but upon its antiquity. The crest ought not to be charged on the shield, as it was co-equal with it. He would like to know where the supporters were introduced. It was painful now to see the base uses to which heraldry was put. He seconded the vote of thanks, which was agreed to.

Mr. Pink returned thanks. Supporters, he said, were not constantly in use until the Lancastrian period. The President had shown a landable curiosity to ascertain how arms were manufactured now-a-days. Heraldic shops abounded, but the only true source from which to obtain a proper coat of arms was the Herald's College. He did not know what was the origin of the "hatchment," but it might have something to do with the placing in churches after the Reformation of the coats of arms of each reigning Sovereign. Religious heraldry presented a wide field for study; the bearings were such as would never be mistaken for ordinary heraldic bearings, and he believed they were introduced as tokens of the greatest respect. He had not referred to the lettering of mottoes. Sometimes these were very disagreeable, the most crabbéd forms being used,

but in the seventeenth century they would find exceedingly charming Roman lettering.

The Scrutinizers next presented the result of the balloting for officers for next session, which was as follows:—

President.—Mr. Cole A. Adams (re-elected).
Vice-Presidents.—Messrs. C. R. Pink and H. W. Pratt.

Ordinary Members of Committee. Messrs. F. T. Baggallay, F. E. Eales, A. J. Gale, T. Garratt, J. A. Gotch, W. J. N. Millard, A. B. Pite, H. H. Stannus, L. Stokes, H. G. Turner.

Hon. Treasurer.—Mr. J. Douglass Mathews.
Assistant Treasurer.—Mr. H. W. Pratt.

Librarian.—Mr. R. L. Cox.

Secretaries.—Messrs. W. H. Atkin Berry and H. D. Appleton.

Solicitor.—Mr. Francis Truefitt.
Assistant Librarians.—Messrs. W. Burrell and J. Shelley Birch.

Auditors.—Messrs. G. A. Pryce Cuxson and H. York.

Registrar.—Mr. Thomas H. Watson.

The meetings then stood adjourned for the session.

PROGRAMME OF THE FIFTH INTERNATIONAL SANITARY CONGRESS.

At the conclusion of the series of articles describing the Fourth International Congress of Hygiene, held at Geneva in September, 1882, we announced that the Fifth Congress would meet in the course of two years at the Hague. The time for the realisation of this promise is now drawing near, and, in answer to inquiries, we have ascertained that all necessary preliminary arrangements are already definitely concluded. The Congress opens on Thursday, the 21st of August, to conclude on the following Wednesday, the 27th. The general meetings will be held in the afternoons, as usual, while the sections meet in the mornings. There are in all five sections; but, as sections i. and iv. transact their business from nine to eleven o'clock, and sections ii. and iii. from eleven to one, it will be possible to follow more than one of the sections. The fifth section is, properly speaking, a congress of itself, and meets every day to discuss all that appertains to sanitary and health statistics. Formerly the International Congress of Demography was held separately; but of late its members have united their efforts with those of the International Hygienists. In the first section questions relating to general and international hygiene, the prevention of infectious diseases, &c., will be debated. The second section is devoted to the hygiene of towns and rural districts, and this comprises such questions as pavement, water supply, the treatment of dust and refuse, lighting, public edifices, hospitals, asylums, prisons, baths, drainage, irrigation, woods and forests, public means of transport, railways, cemeteries, and cremation. The third section deals with personal hygiene, the effect of climate on the individual, food, clothes, houses, education, gymnastics, orphanages, &c. Finally, the fourth section, under the title of professional hygiene, will investigate unwholesome industries, unwholesome dwellings, artisans' dwellings, crèches, cheap lodgings, military and naval hygiene.

For the general sittings, held in the afternoon, we are already promised a paper by Dr. Pasteur, on the same subject which he treated at Geneva, "The Attenuation of Virus," while the eloquent and poetic doctor and Senator Pacchiotti, of Turin, will on the same day deliver an exordium on modern and future hygiene. Dr. Corfield, of London, will read a paper on "Science the Enemy of Disease." The eminent French architect, M. Émile Trélat, will treat the question of temperature within the house and the air breathed indoors; and Dr. J. Crocq, of Brussels, has a paper on water supply. Other points of equal practical interest will be brought forward at the general assembly of the Congress, while the wide scope of the subjects chosen for the work of the section will admit the discussion of almost any question having a practical bearing on the preservation of health.

All persons wishing to become members of the Congress should at once send in their names, addresses, and professions to the secretary, General Dr. Van Overbeek de Meijer, Professor of Hygiene at the University, Utrecht, Holland. The subscription amounts to ten florins (Dutch money), and this not only admits to all the privileges of the Congress, but ensures a copy of

the report of the proceedings, which, to judge from the previous congresses, is likely to be a voluminous and valuable volume. Foreign governments are invited to appoint their delegates. It will be remembered that at the last Congress some twenty-five nationalities were represented. The Dutch railways will give a return ticket gratuitously to the members of the Congress, and it is very probable that the Belgian and Northern lines of France will make similar concessions. A lodging committee has been appointed to assist members to find rooms, &c.; but the accommodation is apparently somewhat restricted, as intending visitors are urged to apply early. At Geneva, more than five hundred persons subscribed to the Congress, and between three and four hundred were actually present; but there are far more hotels in the capital of Switzerland than at the Hague, and it is therefore only prudent to take this circumstance early into account.

The Dutch Minister of the Interior, M. J. Heemskerck, will be the honorary president, and W. H. de Beaufort, Member of the Upper Chamber of the States General, will be the acting President, while the Committee of Organisation is composed of some of the most eminent physicians and engineers of Holland. The Congress is open to all who, by reason of their usual pursuits, are in any way connected with sanitary questions; that is to say doctors, architects, engineers, builders, administrators, inspectors, authors, journalists, &c. Unfortunately, England has always been poorly represented at these great international gatherings; but as in this case timely warning is given and the distance is short, we trust a better result, so far as we are concerned, will be achieved.

EXCAVATIONS AT ROME.

We extract the following from a long and interesting letter of the *Times* correspondent at Rome, in regard to further discoveries on the site of the house of the Vestal Virgins:—

The treasure, in the form of sculpture and inscriptions, found in the course of the excavations in the House of the Vestals, has been altogether unprecedented. The records of the Roman excavations that have come down to us, from the earliest left by Aldroand and Flaminian Vacca, may be searched in vain for any parallel instance. It is the first time, however, that anything like a sculpture gallery has been discovered, for the Atrium Vestæ, peopled as it must have been with statues of the Grand Vestals, may fairly be considered in that light.

As the works of excavation were continued along the south-west portico of the atrium no fewer than sixteen marble statues in different states of preservation, and eight pedestals of statues, were found within very short distances of each other,—in fact, some of them quite close together; and lying among them large fragments of broken columns, pieces of architectural detail, and innumerable bits of wall panelling of various coloured marbles. For more than a fortnight each day's work generally ended with the sight of the head or the feet of another statue, the base of a column, or the corner of a pedestal, projecting from the bank side of the accumulation, to be completely interrupted the next morning. Counting some distinct fragments of statues and the five pedestals found previous to the clearing of this south-west side of the atrium, the total results are twenty-one statues and remains of statues, and thirteen pedestals, twelve with inscriptions and one with the inscription entirely erased. But, alas! there have also been found within and among the remains of the House and its atrium no fewer than four lime-kills. They tell a fearful tale of art massacre, which was probably arrested at the spot where the last of these kilns was cut through, at the height of about three metres above the level of the atrium, close to where the statues of Vestals were lying huddled together, and they add further to the abundant proof already possessed that thousands of priceless works of sculpture which adorned the ancient city perished in this way to provide lime for the builders of mediæval Rome. They fully account also for the complete nudity of the north-east side of the atrium. Of the marble slabs which formed its pavement and panelled its walls, of the many columns that extended along it, or of the statues and their pedestals that stood within it, nothing was

found remaining but two or three small fragments of columns of breccia corallina, the cushions, or foundation stones, flush with the ground, on which the columns of the portico stood, and the three pedestals first discovered, which had been used in the building of some later edifice at the north extremity of the atrium, close under the Church of Santa Maria Liberatrice. It must have been in the spoliation of this side of the atrium that the fourteen pedestals of statues, of which the inscriptions were preserved and are registered, together with those of three others found elsewhere, in the "Corpus Inscriptionum Latinarum," were dug out in the fifteenth and sixteenth centuries. Adding to them the thirteen disinterred since these excavations were begun makes thirty, independent of the many more which, like the statues on that side of the atrium and in other parts of the House, have been utilised for lime, or like the stones of the Colosseum, for building purposes.

COMPETITIONS.

Artisans' Dwellings, Battersea.—In this open competition, 40 sets of plans were submitted, and that by Mr. Alfred Burr, architect, of 10, Queen-square, Bloomsbury, has been selected and awarded first prize.

Darlington Board Schools.—Eleven designs have been sent in for this building. At the Board meeting on Thursday week, the General Purposes Committee's report was read, recommending the selection of plans marked "Three R's," by Messrs. Clark & Moscrop, of Darlington. The majority of the Board, however, decided to adopt the cheapest, marked "Hope," by Mr. T. Brooks, of Darlington.

THE PROPOSED LOOP-LINE JUNCTION RAILWAY, DUBLIN.

At a meeting of the Council of the Royal Institute of the Architects of Ireland, specially summoned to consider this project, the following resolutions were unanimously adopted:—

1. That the President and Council protest in the strongest manner against the needless and unreasonable disfigurement of the admittedly finest architectural effect in the City of Dublin, of which the Custom House, the grand monumental work of James Grandon, is the principal feature.
2. That as a practical scheme, architects of experience in the City of Dublin will unanimously condemn the injudicious interference with the group property of an extensive area as proposed by a railway crossing several thoroughfares at a skew line, which is manifestly capable of reasonable modification by a shorter and less costly course.
3. That the Institute is by no means opposed to the connexion of the railways of Dublin by a reasonably designed loop-line, but on the contrary, is of opinion that such a line is of vital importance to the progress and prosperity of the city. It is of opinion, however, that it should cross the river to the eastward of the Custom House, and that the sacrifice of berthing to the westward should not be weighed against such a line in comparison with the serious disfigurement of the city now contemplated; and further, that the elevated portion of the swivel-bridge, now recognised as also an uncalled for disfigurement, should be removed at the earliest possible opportunity.

A DAY IN THE COUNTRY.

We have received the following letter, to which we have much pleasure in giving publicity. The schemes which have been started by various philanthropic persons for giving poor London children a chance of knowing what green fields and an open sky are like, deserve the heartiest support and co-operation:—

"The managers of the East London Mission, 263, Cable-street, St. George's, E., earnestly appeal for funds to enable them to take 600 of the poorest children from courts and alleys of East London for a day in Epping Forest. This annual treat, already eagerly anticipated by the destitute little ones, includes dinner, tea, amusements, &c. Contributions from benevolent and Christian friends are most earnestly solicited, and should be sent to Mr. G. Hopkins, Superintendent, Mission Hall, 263, Cable-street, St. George's, E., by whom they will be gratefully acknowledged."

Workington Schools.—The School Board have adopted plans, prepared by Mr. George D. Oliver, of Carlisle and Workington, for a group of schools, accommodating 800 children in three departments, together with a master's residence.

PROFESSOR KERR AND "ENGLISH ARCHITECTURE THIRTY YEARS HENCE."

SIR,—While perhaps many may be found to cavil at its inherent uselessness, as well as to doubt some of its speculative conclusions, few careful readers of Professor Kerr's paper at the recent Conference of Architects can be otherwise than struck with his masterly review of the past fifty years' history of English architecture. There is a freshness and vigour about his language which quite suggests the enthusiasm of youth, while at the same time it is impossible not to feel that one is listening to a tried hand, who has been a keen observer of all the events and incidents of the times he tells of. A keen observer,—but not an unbiased one,—and it is unfortunately his bias which to his own mind suggests his conclusions, and gives purpose to his paper. Professor Kerr rolls along with a lucidity which would delight Mr. Matthew Arnold himself, but, like a bowl, he rolls the way his bias directs him. For instance, when one happens by chance to be acquainted with many lawyers in high places who are quite charmed with their new surroundings, and no doubt rightly but quietly attribute real errors of convenience not to the architect and his unfortunate "Gothic," but to their true source, Mr. Ayrton's parsimony of fifteen years ago, and who leave all the foolish complaints we hear to the few inevitable grumblers who like to think, and the world to think, that they represent everybody concerned, and who must grumble for grumbling's sake, and because they are Englishmen, one cannot but feel that there is but a biased respect for the truth in such an assertion as this, "that the lawyers themselves in high places" are "exasperated at the universal anachronism and anomaly amidst which they are compelled . . . to perform their uneasy business."

Professor Kerr's bias is to be regretted,—certainly by an unsectarian reader.

Once more, as a matter of architectural criticism, however much his remarks may apply to the French treatment of the "standard Renaissance," it is startling to hear of one of our Professors finding effeminacy in Chantres, Coutances, and Amiens. Or again,—this time a matter of a very different nature,—whether we may agree with him or not, that to Scott and Moffat is mainly due the blame for being the parents of all "reckless public competitioners struggling for work at any price," who have been since their time and have still to be, it seems at least reasonable to point out that while much good might be done in combating the unfortunate abuse which has certainly arisen, nothing but evil (by giving the precedent of a well-known successful man to those racials who now practise the abuse) can accrue from attacking the dead, of the greater of whom it is but just to say that no one could be more sorry for his early misdeeds of architecture than he himself was.

But my object is not to pick all possible holes in Professor Kerr's paper. There are in the main but two holes, and those large ones, to pick. One is rather in the leaders of the Conference, who invited him to waste his own time and theirs by useless speculation for the future, when it was their duty to spend it in improvement of the present. The other is in the entire paper from beginning to end, wherein, under the cloak of cleverly-told history, he garbles its incidents to further the speedy return of the architectural world to his darling, the modern European mode, the standard Renaissance.

I must here state emphatically that I am not writing as a partisan of any special style. I object to sectarianism of every kind, and I have taken upon myself to remark upon Professor Kerr's paper not because I deny the truth of his statement that we are returning to the modern European mode, but because,—as he should have done, to make his paper of real practical value to the furtherance of noble architecture and architectural principle,—it is well that we should earnestly consider what we are at present doing in our process of return to it.

It will be enough to take a rapid glance at a few of our largest new secular buildings, and we need not go far. Take some of those which have lately been built at one corner of the so-called grandest site in Europe, and which flank what certainly might have been one of the

grandest streets. Even the Council of the Institute is with me in my criticism on one of these buildings. The Grand Hotel, the new buildings opposite, now the National Liberal Club, the Hotel Metropole, or, as the complete consummation of common place, the new First Avenue Hotel in Holborn. Are these some of the results of our return to the modern European mode? I suppose they are. Insults to architecture, to the public, to our city, they certainly are. Tall walls pierced with many windows stolen from the first handy text-book, covered with meretricious features too feeble for criticism. No shadow of merit of any kind; no attempt at design, save what a builder's apprentice could produce, accursed productions surely (there is no other word to express it), whose effect, with all the money lavished on them, will only be to strengthen that ugliest negative power, which so paralyses our architecture that the public do not care to look at it.

I believe no language can be too strong to condemn huge commonplaces of this kind. They are the worst enemies to the progress of architecture, and for these reasons:—Many may perhaps disagree with the assertion that we have no representative architecture at all other than that of our dens and back slums, and our jerry-builders' flash in suburban streets, which are truly expressive of the people who dwell in them, and who together form the largest mass in the nation, or, again, that our better architecture of late has been but the expression of the minds and tastes of the educated few, and therefore purely eclectic, having little or no influence upon the masses, while the masses have no care or thought for it. But be this as it may, of this at least we may be assured, that England will not assume a leadership in the illustrious art which it is the pride and joy of the Institute and Professor Kerr to fancy they represent; nor shall we ever recover any living work which will render our towns once more free from the reproach of being man's blot on God's creation, until the masses do take an interest in our work. Reform may have to come from within, and men's minds may have to pass through many changes before it comes. But all the efforts of present refinement to bring it about from without must have some effect, and our architecture,—whose opportunity really is so great because it is always before men's eyes,—should try to do its duty with the rest, and its least duty,—even if only a selfish one,—is to attract passers-by to look at it, and think about it. Its duty certainly is not to ruin noble sites and opportunities. We have surely acres enough of blank walls of proud reticence which have no word of cheer for us without adding acres more, worse than blank, whose only word is a repulse to us.

I have observed, above others, two notable buildings which cause ordinary wayfarers to stop and gaze at them,—Eberle's Hotel, in Victoria-street, is one; it may be for its bold and original ugliness,* but on this I offer no opinion. The other is, the New Law Courts. Our Professor will tell us on account of their "universal anachronism and anomaly." For whatever reasons, these two buildings do at least some part of their duty. Would that there were many more of which the same could be said, and fewer of our present period to which the reproach may not justly be applied, that they do less than nothing because they do evil. Truly much maligned Wilkins's National Gallery, with its "preposterous portico," is a relief after passing by Northumberland-avenue, and its offensive common-places.

If our *congé* to the Gothic revival, hailed so warmly by Professor Kerr, means the welcoming of this "stuff," it is time, indeed, that our societies of architects and our professors of architecture should lend a hand to some practical teaching, and save us from disgrace, instead of feebly wasting their time with insidious speculation likely only to further our disgrace.

Our return to the modern European mode may be a fact, but if it is along the path by which we seem to be travelling, all we can say is, "Heaven preserve us from English architecture thirty years hence."

In conclusion, architecture in all ages has been closely allied to religion, and it is allied to it still in this, that as in the one it is not our business to speculate what the goal will be like, or even to think about the best means of

teaching it there, but to do steadfastly our immediate duty around us, to the advance of good and the obstruction of evil, so in the other it is not our business, but mere useless frivolity, to speculate as to this or that future development; but it is very much the business of all of us, and especially that of our would-be representative body, and our professors, to strive hard for the immediate suppression of all that does irreparable mischief to the cause of a great and noble art.

W. D. CAROES.
Junior Oxford and Cambridge Club,
May 26, 1884.

THAMES CROSSINGS.

SIR,—This question is of such great importance, not only to residents on both sides of the river below London Bridge, but also to the whole population of the metropolis, who in one form or another will have to pay the cost, that no excuse is needed for bringing the matter forward at the present time. A Select Committee of the House of Commons is considering three of the many schemes that have been proposed, namely, a tunnel, a ferry, and a duplex bridge, neither of which meets the necessities of the case.

In the tunnel scheme the cost of the ground alone required for making the approaches, necessarily long so as to allow of workable gradients for the traffic to descend to sufficient depth to pass under the river, is put by Mr. Goddard, in his evidence before the Committee, at 950,000. To obviate this first great cost for land for approaches by an alternate scheme it is proposed to lower and raise the traffic vertically by hydraulic machinery near the sides of the river, thus substituting for the large original cost a continual working expense. Even then, however, the cost of the ground required for approaches and for placing the machinery is put at 250,000. Besides, a tunnel at best is but a dreary expedient. In the ferry scheme the difficulties attending the shipment and unshipment of so large a traffic would be enormous and costly. The ferry boats, to be of any practical use, must be continuously crossing and recrossing the river at right angles to the course of the passing ships, and the consequent danger from collision is almost too great to think of.

The duplex bridge scheme of Mr. Barnett is equally objectionable. The bridge begins and ends at the sides of the river in the ordinary way, as a single bridge, and branches into two in the middle of the stream. The branches are intended to be opened alternately, to allow ships to pass. While one branch is open to admit or let out the ships, the traffic is diverted along the other branch, and *vice versa*. In fact, it is worked in exactly the same way as the ordinary canal lock, with this difference, that a roadway passes along the top of each of the gates. In non-tidal waters this arrangement might work reasonably well; in a tidal river like the Thames it is simply out of the question. Large sailing ships in a flowing tide cannot be controlled, and instead of stopping abruptly on passing the first branch of the bridge, they would inevitably strike against the second, with a force proportional to their velocity and mass.* Both the bridge and the ships would require to be very strong, and the users of the bridge would require a new and powerful nerve tonic to enable them to bear bridgequake, as an additional horror of the time.

Now that each of these schemes has been considered and found wanting, I venture to submit one for criticism which I think is as free as possible from objection. What is wanted is an efficient and continuous means of communication between the north and south sides of the river without interfering with the traffic of the port of London. *Prima facie* this can only be done in two ways,—by a high level bridge and by a tunnel. I prefer the former, but, *mutatis mutandis*, the most of my remarks will apply to either. Instead of crossing the river transversely at right angles to its course I cross it diagonally, so as to obtain the greater part of the gradient for the roadway on the river itself instead of on the land, and thus do away with the necessity for expensive approaches. Or I may, where desirable for the public convenience, run two such bridges from each side of the river meeting in the middle of

the stream and forming a compound bridge in shape something like the letter X. A bridge of this description could be constructed with one large central arch, or preferably with two large central arches, one for ascending, the other for descending river traffic.

If, for example, a bridge on the diagonal principle were run from Shadwell, at the junction of High-street with Broad-street, to or near the end of Swan-lane, Commercial-road East, the leading thoroughfare on the north side would be connected with the Deptford Lower-road and Jamaica-road on the south side. By a glance at the Ordnance map it will be seen that advantage is taken of the high ground at the starting-point for part of the elevation, the remainder being obtained on the river itself, so that the lateral riparian traffic has easy access to the bridge without going a long way inland to get on to the approaches, or ascending spiral roadways at the river sides.

To afford greater facilities a spur could be run from the end of Old Gravel-lane to meet the diagonal bridge at or near the middle of the river. This bridge would be of Y shape, having two of its extremities on the north and one on the south side. It is claimed for this high level bridge that it admits of uninterrupted navigation of the river and continuous roadway traffic; that its approaches are near the river itself and not costly, and that it does not involve continual cost of working or the performance of such next to impossible feats as the stopping abruptly of large ships in a flowing tide.

JOHN RONALD SHEARER, A.C.A., M.S.A.

THE MYSTERIES OF COLOUR.

SIR,—Had you been able to publish a fuller report of my lecture on the "Mysteries of Colour" you would have found, I think, that the remarks of Mr. Roberts [p. 804, ante] would not have been necessary. I said with reference to the primary colours that "Dr. Thomas Young, some eighty years ago, discovered that the primary colours were red, green, and violet, but we cannot work on scientific principles in dealing, as we have to do, with pigments or paints, and not with those elements of light which cause the various sensations to the red-seeing or green-seeing or violet-seeing nerves. The scientific theories of colour, although deeply interesting, cannot help us very much in our present study, and whether the old theory of Thomas Young is correct or not (it has been rejected by later scientists) it is very evident that if our paint-box consisted of three cakes of colour only, say vermilion for red, emerald-green for green, and violet-carmine for violet, we should be in a sore strait to paint any object whatever with such a palette. Where would be our blue skies, our yellow sands, &c.? We have but to try a few experiments in mixing such pigments as these to find that the result would always be mud. We must go back to the old red, yellow, and blue, and their various combinations, to find the letters of our alphabet of colour."

I should say, sir, from your own observations that you will see the practical nature of the above remarks, and that they are not made in ignorance of the modern theories of colour. It is most difficult to explain to some scientific men that paints are not coloured rays, and that if any ingenious person would provide us with coloured rays in a fixed medium we should be very pleased to use them,—but they will not listen.

G. A. STOREY.

SIR,—The vitality of error is proverbial. So the antiquated notions concerning the science of the harmony of colour die hard, for numerous writers are still to be found who labour under the fallacious supposition that that science should be based on some objective harmony in nature, on some experience of external existence, instead of, as it really should be, on the experiences of our sensuous nature, of the appositeness of certain combinations of sensations to the perfectly organised eye. The great colourists were, for this reason, enabled to work with confidence on the intuitive science of their own exquisitely constituted eyes, and without having, in fact, any intelligible theory whatever of light-colour. None had been formulated in their days. It is astounding that this important fact should be so constantly overlooked. The sticklers for what is erroneously called the science of colour also lose sight of the fact that the old notion of primaries, secondaries, &c., is utterly broken down by the elevation of green to the peerage of colour,—

* If these are really the proposed conditions for the duplex bridge, we can only say that those who have suggested it must be utterly ignorant of the behaviour of ships in a tideway. They had better go on the Thames and try.—Ed.

* Probably.—En.

to the title of a primary; for whilst green was regarded in the humble capacity of a secondary, and as belonging to the lower house, everything could be arranged by Field and others past enough. But now that red and green are recognised as being of equal rank,—as being both primaries,—what becomes of your declaration that a primary harmonises with a secondary, &c., for we learn by the new determination that the notion of primaries harmonise! The fact is that the notion of primaries, secondaries, &c., can neither be borne out by a rigid interpretation of the undulatory theory, nor by our sensuous experience.

The great mystery of colour, however, lies in this, that according to the rigid interpretation of the undulatory theory of light, colour is a condition excited in the sentient by external undulatory action; colour neither comes from the sun nor passes through a prism. It belongs neither to a flower, nor to a substance, nor to the ether, nor to a ray, nor to a pigment. Colours, like musical notes, have no external existence whatever, but as vibrations. "Why," says Sir John Herschel, "a vibration should, in the eye, produce colour, and in the ear, sound, cannot be explained." Here, then, we have a phenomenon beyond the probe of science, a somewhat she cannot fathom, and in all probability, which she never will fathom. It is, indeed, a something of which much might be made by the metaphysician.

W. CAVE THOMAS.

SIR,—Mr. Storey would, I am sure, be the last person to doubt the accuracy of modern scientists, even to tell the components of white light are red, green, and violet, and not, as formerly stated, red, blue, and yellow. But he may reasonably be supposed to be aware that to talk of white light is one thing, to talk of white pigment another. It would, I submit, be entirely useless to tell a class of students,—or, indeed, any other persons, artists or non-artists,—that red and blue, either when mixed or placed in close apposition, do not constitute purple, or that blue and yellow do not make green, when their colour-sense proves to them that such is undoubtedly the effect. It may be that the word "primaries,"—which formerly meant red, blue, and yellow, and was so applied, because those three colours were thought to be the "prime" or first elements of white light—must now, in view of the discoveries of science, be deposited or altered in its use. The confusion seems to arise, in your editorial note very justly observes, on the difference between white as a pigment and that which is conventionally called white light, but which ought more properly to be called colourless light. No one who supposed that red, blue, and yellow pigments, if mixed in due proportion, would produce a white pigment, or, indeed, any colour which could convey to the brain the effect which we call white. Not, indeed, we may assume, would scientists claim any nearer approach for red, green, and violet, if mixed in pigments.

It seems to follow, from what has been above written, that, in spite of, but not the least in contradiction of, the discovery of modern scientists, the three colours red, blue, and yellow—will still form the "alphabet of the artist," because with them, and by their proper manipulation and arrangement, he can form,—as he cannot do with red, green, and violet,—those mixtures and hues which to his eye are the language of his art. It necessarily also seems to follow that artists should cease to use the word "primary" as applied to blue and yellow, and adopt some other word, such as "simple" (though even that might be objected to). But, if this contention be reasonable, it seems to be an equally reasonable one that scientists should cease to use the word "white" as applied to light, because that word distinctly implies a specific effect or impression on the brain through the retina, and is properly applied to the object which produces that impression. But light, as such, and without an object to reflect this or that constituent ray, would be merely the medium of vision, ready to come into play the moment an object should be presented to the eye. It is obvious that new discoveries involve not only the invention of new terms for new things, but often a revised nomenclature for old things.

I only wish that some able pen than mine, such as that of Mr. Brudenell Carter, who has deeply studied colour vision, would give a lucid exposition of the subject.

EDWARD P. WOLFEFSTAN.

P.S.—I may add that Mr. Storey informs me he has himself written a reply to Mr. Roberts's letter; but he also approves of this letter.

Cardiff Architectural Sketching Club.—

The President of the above Club (Mr. E. M. Bruce Vaughan) delivered his inaugural address to an appreciative audience at the Town-hall, Cardiff, on Saturday evening last. Messrs. S. W. Allen, W. Frame, and G. E. Halliday (honorary members), were present, and gave good advice to the younger members; and this newly-formed club seems to have made a good start. The usual votes of thanks having been carried with acclamation, the meeting was adjourned. Margaret Abbey, the seat of Mr. C. B. M. Talbot, M.P., was visited on Monday.

GERMAN ARCHITECTURAL EDUCATION.

SIR,—I beg to reply to some remarks made by Mr. Lawrence Harvey in the last number of the *Builder* as to the "German System of Architectural Education."

Mr. Lawrence Harvey is quite right in saying that many professors of the Zürich School of Architecture were Germans; but he is wrong in concluding from this fact that the "school-boy system" dominant in the Zürich Polytechnical School, is also the German system of architectural education. Semper, Lübke, Kinkel, and others, and with them their numerous German pupils, have left Zürich many years ago, and they have been induced to do so partly by this very system inaugurated and insisted upon by the Swiss authorities.

Also, Mr. Phené Spiers is deceived by his recollections of the short visit he paid to our polytechnical schools and academies about twenty years ago. They are, besides, entirely changed since that time, and I am sure Mr. Spiers would not consider it fair to have the architectural schools in England judged by the standard of 1864. It is to be regretted that his information is so incorrect and obsolete, so much the more as his description of the École des Beaux Arts in Paris and its ateliers is, for all I know, wonderfully true and exact.

The German technical high schools rank, as the name implies, with the universities. There is as little "school-boy system" in the one as in the other. If it be of interest to your readers I shall be glad to give some particulars, at some future time, as to the course of studies, &c., pursued in our schools; but nobody would be more qualified to do so than the corresponding member of the Royal Institute of British Architects, Professor Ende, in Berlin, who has succeeded in gathering a numerous attendance of pupils in his atelier of the Technical High School at Berlin.

H. WAGNER.
Professor of Architecture at the Technical High School, Darmstadt.

"A QUESTION OF BOUNDARIES."

SIR,—I beg to inform you that the rule for Property Right varies very much, according to the county in which the case arises. I have known as much as 33 ft. allowed, and as little as 3 ft., from the stool of fence. Of course, however, the probability is that either in the office of the Clerk of the Peace for the county of Middlesex, or in the parish church or some local office, an award of that parish in which the point is mooted will be found, and in it will be found a clause clearly specifying the property right, from which there is no appeal. If not, "Surveyor" had better inquire for those measurers employed on behalf of that parish referred to, who will tell him the property right, as intimated by them to the Ordnance Surveyor, or I doubt not that upon the payment of a small fee he will be able to arrive at the fact on application at 43, Parliament-street, S.W.

O. O. S.

CASE UNDER THE METROPOLITAN BUILDING ACT.

DISTRICT SURVEYOR FOR EAST HACKNEY (NORTH) D. HAWKINS.

At the Worship-street Police Court, on the 29th ult., before Mr. Biron, this case was heard. It appeared that the defendant had erected in the rear of his house, No. 9, Rushmore-road, a shed constructed of woodwork, the wall of the house forming one side of it. The roof was covered with felt. It was 16 ft. 6 in. long, and 6 ft. 6 in. wide, the average height being 5 ft. 9 in. It contained two tricycles. There was no direct communication between the shed and the house.

The District Surveyor, following the decision in the case of himself v. Snewin, Bros., & Co. (*Builder*, January 25, 1879), considered the shed was an alteration, addition, or other work in, to, or upon the building, No. 9, Rushmore-road, and was subject to the regulations of the Building Act, which required that the walls and roof should be of incombustible materials.

The Magistrate considered the shed was not an addition to the house, there being no direct communication between them, and that the rules of the Building Act did not apply to such structures, but he would grant a case.

Hospital, Bucknall.—At a meeting held on Monday of the Hanley, Stoke, and Fenton Joint Committee for the erection of a Contagious Diseases Hospital, Mr. G. W. Bradford, of Hanley, was appointed architect of the proposed hospital to be erected near Bucknall, at a cost not to exceed 4,000*l.*, of which 750*l.* has already been expended in the purchase of the site.

Books.

A Royal Warren; or, Picturesque Rambles in the Isle of Purbeck. By C. E. ROBINSON, M.A. The Etchings by ALFRED DAWSON. London: The Typographic Etching Company. 1882.

THE exploration of England bids fair to be one of the achievements of the present century. Scarcely a year passes without the production of at least one book, which, by the aid of pen and pencil, draws attention to some hitherto neglected district, and tempts the tourist to seek for unknown beauties within the four corners of his native land. The goodly quarto which lies before us,—rendered attractive alike by the artist's and the printer's skill,—deals with a sequestered nook in south-western England, into which few but sketchers and geologists have as yet penetrated, and though a year or two has elapsed since its publication, the subject of which it treats is probably practically as new as it was then. Not that there are any special dangers or difficulties in the way, but the place happens still to lie outside the railway route, and, in more senses than one, remains an isolated spot. The Isle of Purbeck is a quasi-peninsula towards the near extremity of the county of Dorset. The sea, or at any rate salt water, washes three sides of it, and between it and the mainland a river with marshy banks, a wide and desert heath, and "huge barriers of inhospitable chalk" intervene. It is not surprising that its charms, which are many and rare, have been displayed to few, but amongst those by whom they have been recognised and loved we may mention Turner, E. W. Cooke, and Seymour Haden, and now and again excursionists from Bournemouth find their way to the more accessible beauties which the coast presents. Lulworth Cove, grandly picturesque with its rocks and caverns, lies just outside the boundaries of the Isle of Purbeck; but within them there is, to begin with, the famous ruin of Corfe Castle. Tradition points to the inner gate of the existing fortress as the precise spot on which Elfrida stood when she gave the fatal cup and the fatal stab to her step-son, King Edward; but it is scarcely necessary to say that none of the stones, as they at present stand, were witnesses of the deed. "The Story of Corfe Castle" has been often told, and never in more readable fashion than by Mr. George Bankes, to whose well-known volume Mr. Robinson has naturally had recourse. For six centuries it was a royal fortress, but was granted by Queen Elizabeth to Lord Chancellor Hatton, who, following the fashion of the times, made it into the castellated country seat, which it continued to be until its destruction during the civil wars. Hatton's widow brought it in dowry to her second husband, Sir Edward Coke, the celebrated lawyer, and it thus devolved to their frail daughter, known as Lady Purbeck. From her hands it passed by sale to Chief-Justice Bankes; and it was the spirited defence of the castle by Lady Bankes during two close sieges,—one in 1643 and the other in 1646,—which has made the name of Corfe Castle familiar as a household word. The Parliamentary troops, after getting possession of the fortress, had to spend a good deal of time and trouble in "slighting" it, but the result was to convert the noble building into a picturesque ruin, which forms the subject of one of Mr. Dawson's most successful etchings. But the Isle of Purbeck has many other interesting features, besides Corfe Castle. Old manor-houses, mostly built on older foundations, nestle in umbrageous hollows; churches and chapels, rich in beauties which the restorer's hand has not yet invaded, make even the finest village worth a visit, and have at least this in common with the abbey and cathedral of our land, that the Norman and Early English styles predominate in their architecture. For centuries the island has been celebrated for its quarries, which yield an oolite, similar to the Portland, but somewhat harder, and Purbeck marble was for a long time the only material of its kind that could be obtained in England. Numerous entries occur in the books of the Sheriffs of Dorset of payments made in the reign of Henry III. for shiploads of marble carried to the Tower of London, the Church at Westminster, and other places, and in nearly all the southern cathedrals, including Canterbury, we see that Purbeck marble was extensively employed. The quarries whence the chief supplies were drawn have been abandoned, not because of any deficiency of material, but because

easier means of shipping were presented at Swanage, a little port which vainly struggles to become a watering-place.

Enough has been said to show that in the Isle of Purbeck the author and illustrator of these Rambles have found a congenial subject both for pen and pencil. Each of them well deserves his share of praise for his contribution towards an unusually charming volume. The smaller etchings,—scattered over the pages with no niggard hand,—are clear, careful, and thoroughly artistic. They have been reproduced by the "Typographic Etching" process. The larger plates, which aim at the effect of a copper mezzotint, have been executed partly with the needle and acid and partly by "photogravure." The results of the latter process are sometimes (as in the difficult subject, "Tilly Whim") rather blurred, but the view of St. Alhelm's Head is an admirable example of what can be effected by its means.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

May 23.—8,108, W. M. Hawkins, Birmingham, Construction of all kinds of Buildings, &c.—8,124, G. J. C. M. Baron de Liebhaver, London, Cleansing, Polishing, and Colouring Buildings, &c. 8,125, J. G. Smeaton, London, Heating and Ventilating Dwelling-houses, &c.—8,131, L. G. F. Pyne, Watford, Fire Escape, Com. by W. R. Pyne, Trinidad, West Indies.—8,133, B. Taylor, Donistown, Sash Fasteners.—8,146, W. H. Tylor, London, Water Supply of Water-closets, lavatories, urinals, &c.

May 26.—8,160, J. Walker, Birmingham, Door-Lock and Latch Furniture.—8,161, T. Treubert and W. Thomas, Cardiff, Cord Rack for Window Blinds.—8,172, W. Greenwood, C. Mitchell, and H. A. J. Bond, Keighley, Weather-bars for doors, Buildings.—8,174, J. M. Lamb, London, Ventilating Appliances for Heating and Cooling the Air.—8,175, A. Dubbing, Darlington, Cramping-up Floor Boards.—8,181, W. A. Petre, Woolstone, Locks and Latches.—8,193, F. A. Harrison, Birmingham, Bolts for Doors.—8,195, B. Baron, Acerington, Excluding Draughts, &c.—8,202, A. Macfarlane, London, Spring Bolt Sash Fastening.—8,217, A. J. Boulton, London, Manufacture of Parquets, Floor-plates, &c. Com. by C. Wittkowsky, Berlin.—8,234, J. Parrott, Wallington, Ventilating Sewers, &c.—8,236, G. Walker, Leeds, Asphalting used in Wood-paving, &c.—8,245, J. A. Turner, West Gorton, Wall Papers.

May 27.—8,249, T. W. Twyford, Hanley, Flushing and Ventilating Closet-basins.—8,250, W. Mackie and W. G. Mackie, Sutton, Window Fastening.—8,256, B. Reynard, Barrow-in-Furness, Plates for Building in Concrete.—8,259, F. W. Primrose and J. Mellowes, Sheffield, Glazing.—8,261, B. J. B. Mills, London, Grates, Com. by T. Kirkwood, Chicago, U.S.A.—8,270, R. W. Gardner, London, Self-closing Burglar-proof Window Fasteners.—8,292, G. Walker, Leeds, Heating Asphalte and Laying the Same.—8,297, C. T. Hight, London, Adjusting Door-knobs on their Spindles.—8,298, F. Normandy, London, Window Blinds.

May 28.—8,313, J. Brooks, Bury, Sweeping Flues or Chimneys.—8,317, J. Fottrell, Dublin, Sanitary Concrete.—8,322, F. Hoeking, Liverpool, Stoves for Cooking, &c.—8,323, G. Walker, Birmingham, Preventing the Accumulation of Dust and Dirt in Corners of Rooms, &c.—8,325, W. P. Bayle, London, Self-adjusting Pulley for Window Blinds.—8,334, C. Dolin, London, Chimney-tops and Exit Ventilators.—8,338, G. G. Rutty, London, Scarifying Macadam Roads, &c.—8,345, W. H. Chapman, Lewisham, Ventilating Buildings, &c.

May 29.—8,373, F. J. McAdam and H. Jones, Liverpool, Window Sashes.—8,378, W. Roberts, Fararworth, Chimney-pots.—8,395, W. C. Cannon, London, Hot-water Coils.

SPECIFICATIONS ACCEPTED.†

May 30.—5,151, J. Sewell, Knaresborough, Construction of Glass Roofing.—5,361, C. D. Abel, London, Separating and Collecting Soot from Smoke of Chimneys, &c. Com. by R. Schomburg, Berlin.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending May 31, 1884.

4,868, W. Smeaton, London, Water Waste-proventers. (Oct. 12, 1883.) Price 2d.

A dome above an elastic valve is raised by the handle of the closet, causing a vacuum in this space, and raising a lower elastic valve, whereby a flush is effected. The after-flush is given through a bye-pass outside the body of the valve, and is regulated by a screw plug. (Pro. Pro.)

4,927, J. S. Gabriel, London, Paving Streets. (Oct. 16, '83.) 2d.

Wooden blocks are laid on a concrete foundation. Above the block is a coating of sand, on which is a layer of small granite blocks, grouted with lime on a layer of asphalt.

4,954, W. Spence, London, Application of Chemical Agents to Natural or Artificial Stones and to

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the date named.

Stuccoes, in order to diminish their porosity and increase their resistance to external influences. Com. by MM. Faure & Kessler, Clermont-Ferrand, France. (Oct. 17, '83.) 4d.

White stones are treated with the fluoroborates and fluorosilicates of ammonia, magnesia, alumina, and zinc, and with the fluosilicate of lead; coloured stones or stucco, with the fluosilicates of iron and manganese, and the fluoride and fluosilicate of chromium or cobalt or nickel, &c.

4,979, E. French, Birmingham, Castors for Furniture. (Oct. 19, '83.) 4d.

An inverted cup is attached to the leg of the furniture, with a recess in its apex. A small ball is placed in this recess, which takes the friction of the larger ball below in the cup, and a ring is screwed on the cup to keep the balls in position.

4,989, J. Barker, Penge, Preventing Down-draught in Chimneys, &c. (Oct. 19, '83.) 2d.

A larger pipe is fitted round the top of the chimney cap, above which is a cowl with two opposite apertures of different sizes, and a vane keeps the smaller aperture facing the wind, which enters and is deflected by flanges across the conical top of the inner tube, whereby an upward current is induced. (Pro. Pro.)

5,005, T. Smith, Birmingham, Roller for Window-blinds. (Oct. 20, '83.) 2d.

This roller is telescopic, so that it can be fitted to any size of window, and a longitudinal slot is made in the roller, through which the head of the blind is passed, and is secured to a rod inside the roller. (Pro. Pro.)

MEETINGS.

SATURDAY, JUNE 7.

Association of Public Sanitary Inspectors.—Annual Dinner at the Holborn Restaurant. 6 p.m.

MONDAY, JUNE 9.

Royal Institute of British Architects.—Last ordinary meeting of the session. (1) Presentation of Royal Gold Medal, and other medals and prizes; (2) Mr. J. T. Wood on the "Temple of Diana at Ephesus." 8 p.m.

International Health Exhibition Conference.—(1) Dr. Tripe on "Domestic Sanitary Arrangements of the Metropolitan Police." (2) Mr. Ernest Turner on "The Improvement of the Sanitary Arrangements of Metropolitan Houses." 2 p.m.

TUESDAY, JUNE 10.

International Health Exhibition Conference.—(1) Dr. Wilson on "Domestic Sanitation in Rural Districts." (2) Mr. H. Percy Boulton on "Sanitary Houses for the Working Class in Urban Districts." 2 p.m.

Anthropological Institute.—(1) Mr. W. Howitt, F.G.S., and the Rev. L. Fison, M.A., on "The Deme and the Horde." (2) Mr. C. A. Goulson on "African Sahel Language." (3) Dr. S. M. Curl on "Phœnician Intercourse with Polynesia." 8 p.m.

Borough Architectural Association.—Nomination of officers.

WEDNESDAY, JUNE 11.

International Health Exhibition Conference.—Dr. John Syer Briatore on "Industrial Diseases." 2 p.m.

THURSDAY, JUNE 12.

Society of Antiquaries.—Ballot for the Election of Fellows. 8.30 p.m.

Society for the Encouragement of the Fine Arts.—Dr. C. M. Campbell on "What Health Owe to Art." 2 p.m.

International Health Exhibition Conference.—Dr. W. N. Thrusfield and Professor Corfield on "Spread of Infectious Diseases" (a) through the Agency of Milk, and (b) through other Agencies." 2 p.m.

FRIDAY, JUNE 13.

International Health Exhibition Conference.—Dr. Alfred Hill and Dr. Alfred Carpenter on the "Notification of Infectious Diseases" (a) Its Importance and its Difficulties; (b) The Right and Duty of the State to enforce it." 2 p.m.

SATURDAY, JUNE 14.

International Health Exhibition Conference.—Dr. A. Wynter Blyth and Mr. Wm. Essie on the "Disposal of the Dead: Cremation." 2 p.m.

Miscellaneous.

Anthropometry.—An anthropometrical laboratory will be opened at the Health Exhibition in the course of the ensuing week. The laboratory has been organised by Mr. Francis Galton, and it will be the means of showing to the public at large how certain personal facts may, with care, be measured and recorded. In order to prevent crowding, a small fee will be charged for admission. Each person who enters will be furnished with a pamphlet explanatory of the objects of anthropometry, and included in the pamphlet will be a schedule with blank spaces, which will be filled up in the course of the passage of the visitor through the laboratory. The completed schedule will contain a record of name (or initials), age, sex, occupation, place of birth, colour of hair and eyes, height, standing and sitting, weight, length of span of arms, strength of squeeze and pull, swiftness of direct blow, capacity of chest as measured by a spirometer, acuteness of vision as measured by a test type, conditions of colour sense, and acuity of hearing. It is not improbable that this "laboratory" may become rather a favourite resort for visitors to the Exhibition, in which case a large mass of facts will be collected (for a duplicate schedule will be retained by the attendant), which will, doubtless, be turned to good account by Mr. Galton.—*Lancet*.

The Extensions at the General Post-Office.—The extension works at the General Post-Office, on the west side of St. Martin's-le-Grand, which have been in progress for nearly two years, are now almost completed and ready for occupation. The extension consist of the erection of an additional story to the building, which was erected only a few years ago in consequence of the old building on the east side being inadequate to the Post-office requirements. The object of the enlargement, now approaching completion, is to provide increased accommodation for the clerks employed in the telegraph department, including provision for dining and refreshment purposes. In the execution of the work the whole of the stone-work forming the cornices and parapet of the elevations of the building as originally completed, have had to be removed and replaced above the added story, which consists of the construction of an additional floor, 12 ft. in height. The most difficult part of this section of the work was the taking down of the massive central pediment and columns surrounding the St. Martin's-le-Grand frontage. These have all been restored as they were originally erected, and in continuation the whole of the frontage to Newgate-street. The extension embraces the construction of an additional floor over the whole area of the building, including the King Edward-street frontage, and that on the north side westward from St. Martin's-le-Grand and Aldersgate-street. Messrs. Mowlem & Co. are the contractors, and the works have been carried out under the superintendence of Her Majesty's Office of Works.

A New Fire Escape.—The balconies below the windows of the several stories of the building are constructed so as to lie in a fixed horizontal position or to fold up against the wall of the building. The ladder connecting the several balconies with each other and with the ground, for the escape of the occupants of the building is arranged in a casing set up along the ends of the balconies. The front or door of the building is made in sections of about the height of the respective stories, and each section is furnished with a spring latch to lock upon a catch of a rod supported along one side of the case. The latches are so constructed as to be automatically locked on the rod when the doors are closed, and to be unlatched by a vertical movement of the rod, which has an arm projecting towards each balcony. By this means the rod may be lifted from either balcony, and will simultaneously unlatch all the doors, permitting access to the ladder from any part of the building. A single door, provided with several latches, all of which catch upon the bar, may be used. The ladder can be used without the balconies, the arms being operated from the window of any story. This plan makes a fire-escape which is always in place, and which can be quickly and easily operated from any story in the building. This invention has been patented by Mr. Robert Stevenson, of Muskegon, and further particulars may be obtained from Mr. Charles Stroob, of Ferrysburg, Mich.—*Scientific American*.

Cannon-street Chambers.—This is the title of an extensive and costly block of new buildings which are at present in course of erection in Abchurch-lane and Cannon-street, and for which much valuable property has been taken down. The Abchurch-lane frontage, extending from opposite St. Mary Abchurch and Abchurch-yard to the Bank of Africa and Brown's Bank, is 80 feet in length, whilst the Cannon-street frontage is 60 feet long. The building is intended to be carried up to a height of nearly 80 feet, having six lofty floors and a deep basement. The Abchurch-lane frontage, which will contain the principal entrance to the premises, is in red brick, faced with Portland stone columns and capitals between the windows from the foot of the first floor to the top of the building. The ground-floor portion of the frontage is faced with polished granite piers. The Cannon-street frontage will be architecturally uniform with that in Abchurch-lane. The ground floor contains several large and lofty apartments, one of which is intended to be occupied as a bank, whilst the others will be devoted to general business purposes, the whole of the upper floors containing numerous suites of large and small chambers and offices, in connexion with which there will be a lift from the basement to the top of the building. Mr. G. Sherrin, of Broad-street, is the architect, and Messrs. Chapple & Co. are the contractors.

Industrial Dwellings in Litchfield-street, Soho.—The Improved Industrial Dwellings Company, of which Sir Sydney Waterlow is chairman, are at present erecting a large block of buildings in the locality of Soho, extending from Litchfield-street on the north side to Great Newport-street and Newport-court on the south, which cover an area of nearly an acre in extent. The principal frontage is in Litchfield-street. It is 320 feet in length, extending nearly the whole length of the south side of the street to the boundary of similar buildings at the west end, which a few years ago were erected by another company. The buildings extend southwards into Great Newport-street by a new street formed about the centre of the site, on each side of which the company are erecting blocks of their buildings. This new street, from Litchfield-street to Great Newport-street, opens out a communication in the direction of Trafalgar-square, being continued along Castle-street and intersecting Cranbourne-street. The ground-floor portion of the new buildings erected by the company is intended for business purposes, containing shops on each side, and this also applies to the Litchfield-street and Great Newport-street frontages. The buildings contain six floors, the principal elevations to the different streets being faced with stock brick and red brick bands, with Portland cement window heads, sills, and dressings. The several elevations are surmounted by gables at short intervals. It is stated that the buildings will afford accommodation for a population of about 800 persons.

Buildings in Flats in Covent Garden.—Residential chambers for the middle and well-to-do classes, are extending to the immediate locality of Covent Garden Market, and a block of buildings of this character is now on the point of completion. It is situated at the south-east corner of King-street, its main frontage being in that thoroughfare, and the rear of the buildings overlooking the churchyard of the neighbouring Church of St. Paul. The building has a frontage of 70 feet to King-street, and is nearly 80 feet in height, containing the ground, mezzanine, and three upper floors, with a fourth floor in the roof. The lower part of the frontage, up to a height of about 25 feet, and including the ground and mezzanine floors, is in rusticated Portland stone, the mezzanine floor having bold and handsome arched windows. The ground floor consists of shops, with a pediment entrance between them to the residential portion of the premises above. Immediately above the mezzanine floor is a cornice and balustrade. The upper portion of the frontage is faced with red brick and Portland stone window dressings, each floor having a range of five windows, with balconies at the foot of the second and third floors. The frontage is surmounted by a cornice and balustrade, at the rear of which, in the roof, is the fourth or dormer floor. All the upper floors are described as fitted in flats for residential purposes, each floor containing five apartments, with bath-room and all necessary domestic conveniences. Mr. Cross, of Spring-gardens, is the architect of the buildings, and Messrs. Macey & Sons are the contractors.

Cremation.—At a meeting of the Commissioners of Sewers in the early part of April Mr. Tickle moved, "That it be referred to the Sanitary Committee to consider whether it is not advisable that a proper crematorium should be erected at the Ilford cemetery, that the public may adopt that mode of sepulture, should they so wish, and that they report on same at an early meeting of the Commission." The mover made an able speech on the occasion, the motion was carried, and inquiries and investigations have been made, the result being that the committee recommend that the reference be discharged. It is evident that the public have not been educated up to cremation yet.—*City Press.*

The Interior of Cologne Cathedral.—A correspondent of the *Elberfelder Zeitung* states that the negotiations between the Government authorities and the Chapter have resulted in the selection of Oberkirchen sandstone as the material in which the work contemplated in the interior of Cologne Cathedral will be carried out. From motives of economy it has been decided not to use any more costly material, although such would have been more in harmony with the structure. A simplification of the original designs for the portals is also spoken of, both as regards materials and execution.

New Warehouse and Factory Buildings in Warwick Lane.—Amongst the improvements which are at present going forward in Ave Maria-lane and Warwick-lane, spacious warehouse and factory premises now in course of erection in Warwick-lane, for Messrs. Hitchcock, Williams, & Co., of St. Paul's Churchyard, claim a notice. The building is situated on the east side of the thoroughfare, to which it has a frontage of 60 feet in length, and is carried to a depth of 75 feet in the direction of Paternoster-square. It is 65 feet in height from the street level, but this does not fully represent the extent of the premises, which contain a basement and a sub-basement, carried to a depth of 24 feet below the ground line, the entire height of the building from the sub-basement floor to the top being nearly 100 feet. The elevation is faced with red brick, Lascelles' patent concrete being used for dressings and ornamentation. This will form a specially novel feature in the frontage. Including the basement, the building will consist of seven floors. The whole of the floors from the ground to the upper story will be devoted to general business purposes. From the sub-basement floor to the top of the building, there will be a lift nine feet six inches square. Messrs. Searle & Hayes, of Ludgate-hill, are the architects, and Messrs. Richardson & Son, of Peckham Rye, are the contractors. It may be added that the widening and improvement of Warwick-lane northwards, in the direction of Newgate-street, is about to be carried out, and last week Messrs. Horne, Son, & Eversfield sold the materials of the old buildings on the west side, extending from Amen-corner to the new Canons' residences recently erected by the Dean and Chapter of St. Paul's Cathedral, preparatory to the improvement being effected.

"International" Exhibition, Crystal Palace.—This exhibition is now so far completed, both in the industrial and fine-art sections, that the jury in the latter division have completed their labours. The awards, which were made *inter alios* by Mr. W. Q. Orchardson, R.A., Mr. G. A. Storey, A.R.A., Mr. P. R. Morris, A.R.A., Mr. John Barry, president of the Society of British Artists, are 190 in number, and include, for the United Kingdom, Diplomas of Honour to Sir Frederick Leighton, president of the Royal Academy, to Mr. S. Cousins, R.A., the Royal School of Art Needlework; and Diplomas of Recognition to Fine Art Society, the Graphic Collection, and to Messrs. Cassell & Co. The Diplomas for Foreign Countries are to Japan, for a large bronze Koro and stand, the work of Ichikawa Raijuro, of Tokio; to the "Gesellschaft für Vervielfältigende Kunst," Vienna; to Adolph Holzhansen, of Vienna; to Mr. R. Schuster, of Berlin; and a Diploma of Honour to Mr. W. Ronzio, of Brussels. The greater number of gold, silver, and bronze medals have fallen to the United Kingdom, France, and Germany; but the Netherlands, Belgium, Italy, and Scandinavia obtain a fair proportion.

Printing-Machine Managers' Fund.—The committee of the Printing-machine Managers' Superannuation Fund, for granting pensions to aged and blind members, announce their eleventh annual excursion to Brighton, Shoreham, and Worthing, the sale of tickets to go to the benefit of the fund. The excursion is for three days, and special advantages are promised in railway fares and accommodation to those who avail themselves of the assistance of Mr. Leahy, the secretary, at the Workmen's Hall, Harp-alley, Farringdon-street.

Toxtheth Park Local Board.—Mr. John Price, Assoc.-M. Inst. C.E., engineer and surveyor to the Barton-upon-Irwell Sanitary Authority, has been elected to the office of surveyor to the Toxtheth Park Local Board at a salary of 350*l.* There were 140 applications for the appointment, which was rendered vacant through the death of Mr. J. A. Hale, C.E., who had held the office for a considerable number of years.

Carlisle: the Church Congress, 1884.—The Executive Committee has purchased the circus which stands on the Warwick-road for £519, upon the valuation of Mr. Geo. D. Oliver, architect, to whom the question of the value was referred as arbitrator. The circus will be transferred into the Congress Hall, in which the principal meetings will be held, and the Drill Hall will be used for meetings of the second class.

The Terlan Church Tower.—In common with the leaning tower of Pisa, the tower of Terlan (Southern Tyrol) has been usually considered as illustrating a fancy of the architect. The most recent investigations point to an opposite conclusion, and a correspondent of the *Allgemeine Zeitung* records the fact that the inundation of 1882 increased its dangerous situation to such an extent as to confirm the opinion which has been expressed as to the progressive influence exercised since its erection in 1438, by causes of a similar nature. The destruction of the tower had been decided upon in the interests of public safety, and the bells had been removed, when the authorities decided to reconsider the plans framed for its restoration, so that there is a chance of this interesting Mediaeval relic still being preserved.

Paris Industrial Exhibition.—The installation of the crown diamonds in this exhibition last week was an incident which attracted a good deal of interest. The jewelry has been placed in a lift, made for the purpose by Messrs. Gratton & Son, in which, after the hours of exhibition are over, it will ascend through a trap-door into a turret or strong-room specially constructed for safety.

TENDERS.

For the erection of new colonial warehouses in High-street, Wapping, for Messrs. Banes, Noel, & Co., Mr. Horner A. Alexander, architect, 72, Cannon-street, E.C.	
Quantities by Mr. E. A. B. Crockett, 16, Mark-lane—	
Anley.....	£21,000 0 0
Smith & Co.....	20,980 0 0
Lawrence & Son.....	20,450 0 0
Holland & Hannen.....	19,980 0 0
Outwaite & Son.....	19,980 0 0
Rider & Sons.....	18,718 0 0
Cunder.....	18,800 0 0
Patrick & Son.....	18,522 0 0
Kirk & Randall.....	18,381 0 0
Mortier.....	18,321 0 0
Greenwood.....	18,300 0 0
Bangs & Co.....	18,135 0 0
Bywaters.....	18,070 0 0
Colls & Son.....	18,851 0 0
Ashby & Horner.....	18,780 0 0
Brass.....	18,277 0 0

For the erection of separate cell vagrant wards, on premises attached to the workhouse, Patricroft, for the Barton-on-Irwell Board of Guardians. Quantities supplied by the architect, Mr. John Price—	
J. & P. Cain, Strefford.....	£1,000 0 0
T. Moore & Sons, Eccles.....	993 0 0
Jas. Roper, Patricroft.....	906 18 0
Wm. Brown, Salford.....	850 0 0
N. Brooks & Son, Patricroft.....	845 12 3
* Accepted.	

For the Oldham Workhouse schools. Mr. Alexander Banks, architect, 231, Rochdale-road, Oldham—	
Percy Wright & Sons, Manchester.....	£17,985 0 0
R. Whittall, Barrow-green, Man.....	12,243 0 0
J. Dyson & Sons, Oldham.....	10,079 0 0
T. Riley, Flixton, Lancs.....	7,015 0 0
E. Nail & Sons, Manchester.....	10,037 0 0
T. Whittaker, Royton.....	10,000 0 0
C. Schofield & Sons, Oldham.....	9,436 0 0
W. Lees, Oldham.....	9,400 0 0
S. Ashton & Sons, Oldham.....	9,139 0 0
W. Whittaker, Oldham.....	9,123 0 0
Executors of the late E. Whittaker, Oldham (accepted).....	9,050 0 0

For additions to brewing plant and other works to be done at the Portulade Brewery, near Brighton, for Messrs. John Dudeney, Sons, & Co., Messrs. Scamell & Colyer, engineers, 18, Great George-street, Westminster—	
Wilson & Co. (Limited), Farnham.....	£270 0 0
Bindley & Briggs, Barton-on-Trent.....	735 0 0
Postleth & Woods (too late).....	
* Accepted.	

For Infectious Diseases Hospital, for the Oxford Local Board. Mr. W. H. White, M. Inst. C.E., Surveyor to the Board. Quantities supplied:—	
C. Claridge, Banbury.....	£9,175 0 0
G. Moss, Oxford and Liverpool.....	8,985 19 3
T. Selby, Oxford.....	8,110 0 0
W. Bell & Sons, Saffron Walden.....	7,827 0 0
J. Dover, Oxford and London.....	7,790 0 0
W. Wilkins & Sons, Oxford.....	7,790 0 0
T. H. Kinglerle, Oxford (accepted).....	7,258 0 0

For new offices and workshops, Clerkenwell, for Mr. Wm. Bessemer Wright—	
Brown, Son, & Blomfield.....	£3,150 0 0
F. Mark.....	3,087 0 0
W. (Rum).....	3,039 0 0
Palman & Fotheringham.....	2,973 0 0
R. Lawrence & Son.....	2,945 0 0
J. Woodward.....	2,910 0 0
S. C. Farmer.....	2,895 0 0
Holliday & Greenwood.....	2,877 0 0
T. H. Adamson & Sons.....	2,870 0 0
Colls & Sons.....	2,770 0 0

For alterations and additions to Christ Church school, Ramsgate. Quantities by the architect, Mr. E. L. Elgar, No. 12, Harbour-street, Ramsgate—	
Miller.....	£418 0 0
Clarke.....	590 0 0
Home.....	590 0 0
Rowman.....	573 0 0
Port.....	570 0 0
Smith.....	518 0 0
White Bros.....	420 0 0
J. Newby.....	485 0 0
Newby Bros.....	418 0 0
(All of Ramsgate.)	

For alterations to premises, Nos. 4 & 6, Rhyl street, Kenish-town, for the "Domestic Mission." Mr. Walter Hall, surveyor, 28, Southampton-buildings, 1.
 Darnford £230 0 0
 Easum 502 14 0
 Keen 492 10 0
 Bullock 393 0 0
 Adams 391 0 0
 Steed Bros. 377 0 0

For girls' and infants' schools, St. George's-in-the-East, for the Governors of Raine's Charities. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue.

Quantities supplied:—
 England & Thompson £5,792 0 0
 W. C. Llan & Co. 5,441 0 0
 Wm. Gregar 4,737 0 0
 Magee 4,550 0 0
 Geo. Stephenson 4,567 0 0
 Martin Wells & Co. 4,347 0 0
 Allen & Sons 4,340 0 0
 J. R. Hunt 4,299 0 0
 D. D. & A. Brown 4,069 0 0
 C. Cox 4,050 0 0
 Ch. Manning 4,030 0 0
 M. A. Palmer & Sons 3,995 0 0
 John Garrud 3,951 0 0
 Wm. Sharnum 3,942 0 0
 Priestley & Gurney 3,850 0 0
 Olley 3,800 0 0
 T. Russell 3,747 0 0

For sewerage, kerbing, and making-up Crownfield-road, for the Leyton Local Board. Mr. Wm. Dawson, C.E., surveyor:—

Pizey £1,288 9 0
 Rutty 1,265 0 0
 Potter 1,150 0 0
 Nease 1,147 0 0
 Impey 1,097 0 0
 Carter 1,070 0 0
 Wilson 1,035 0 0
 Jackson 999 0 0

For the manufacture and delivery of cast-iron pipes, &c., for the Stratford-upon-Avon Waterworks. Contract No. 1. Mr. E. Pritchard, engineer, London and Birmingham—
 Stacion Ironworks Company £3,195 0 0
 Cochrane & Co., Dudley 3,155 0 0
 J. & S. Roberts, West Bromwich 3,114 10 0
 C. E. Firmstone & Bros., Stour-bridge (accepted) 3,064 0 0

For alterations and additions to the Grand Hotel at Brighton, for the Directors. Messrs. James & J. S. Edmonson, architects. Quantities by Mr. Ch. W. Brooks:—

Nye £7,245 0 0
 J. Barnes 6,855 0 0
 Nainwaring 6,441 0 0
 Patching & Son 6,347 0 0
 Lucas 6,181 0 0
 Wm. Oldrey 6,145 0 0
 Smith & Sons 5,796 0 0
 Chappell 5,746 0 0

For school buildings and master's house at Bromyard, for the Bromyard United District School Board. Mr. A. Hill Parker, architect, 5, Foregate-street, Worcester:—

W. Penon, Hereford £1,619 6 0
 J. Bourne, Worcester 1,606 0 0
 J. Kendrick, Worcester 1,533 0 0
 J. Wood & Sons, Worcester 1,425 0 0
 R. Lewis, Bromyard 1,489 10 0
 J. Inwood, Malvern 1,459 0 0
 F. Wells & Son, Worcester 1,441 11 9
 H. Walsh, Hereford 1,392 0 0
 Wm. Jones, Gloucester (accepted) 1,343 0 0

For sundry works at the cemetery chapels, for the Bishops-cleeve Rural Board. Mr. J. E. Prosser, architect. Quantities by the architect:—

J. Hirst & Sons £243 0 0
 R. M. Fairclough 153 7 6
 T. Birtle 149 0 0
 Walter Scott & Son 133 19 0
 J. W. Barra 129 10 10
 R. Hudson, juv. (accepted) 123 6 0
 Geo. Young & Sons 103 16 5

For the erection of stable and coachhouse, Alcester-road, Bermondsey, for Mr. G. J. Grace. Messrs. Geo. Elkington & Sons, architects:—

R. Russell £315 0 0
 Smith & Barnes 310 0 0
 J. Bullers (accepted) 295 0 0

For new roads, sewers, surface water drains, &c., on the British Land Company's Estate at Leyton Hall. Mr. Henry P. Mitchell, surveyor:—

Nowell & Robson, Kensington £1,641 0 0
 C. Killinbeck, Camden-town 1,623 0 0
 T. G. Dunmore, Hornsey 1,605 0 0
 J. Blomfield, Tottenham 1,549 0 0
 F. W. Keeble, Regent's Park 1,549 0 0
 W. Harris, Camberwell 1,535 0 0
 J. Pizey, Hornsey 1,525 0 0
 J. Jackson, Leyton 1,515 0 0
 Peill & Sons, Bromley 1,506 0 0
 E. Wilson, Walthamstow (accepted) 1,499 0 0

For alterations and additions at the Bull's Head public-house, Chandos-street, Strand, for Mr. Cohen. Mr. A. J. England, architect:—
 W. Sherman £855 0 0
 J. Beale (accepted) 783 10 0

For alterations and repairs at the Coach and Horses, Clapham-road, S.W. for Mr. Brett:—
 J. Beale (accepted) £310 0 0
 [No competition.]

For the erection of a cooking apparatus at the schools at Mitcham, Surrey, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Son, 22, Southampton-buildings, architects:—

Geo. Wilcox & Co. 107 10 0
 Barford & Perkins 88 15 0
 May Bros. (accepted) 80 0 0

For the restoration of the tower and nave of the parish church of Marden, near Devizes, and the addition of a vestry and organ-chamber. Mr. C. E. Ponting, Marlborough, architect:—

J. Valls, Frome Selwood £1,475 10 0
 Light & Smith, Chippenham 1,368 0 0
 Restall & Son, Bisley 1,307 3 6
 H. Hoskings, Hungerford 1,273 0 0
 [Architect's estimate, £1,295.]

For rebuilding 27, Widgate-street, E.C. —
 R. Conder £1,300 0 0
 Gregory 1,192 0 0

Gresham Hall, Brighton.—In the list of tenders for this job (see p. 808, ante), for "Fish & Co.," read "Fish, Prestige, & Co."

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

W. C. Brasell (we have received several more letters on the subject, but cannot print them all)—H. M. (ditto)—B. G. (no space this week)—J. B.

Correspondents should address the Editor, and not the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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No. 4. JUNE 7, 1884.

DRESS, FROM A SANITARY POINT OF VIEW.

BY A MEDICAL MAN.



HE factors which directly or indirectly affect the public health are so infinite and so varied that it would perhaps be rash to pronounce foreign to the subject anything which is shown at the International Health Exhibition; yet, even with this proviso, we think the exhibitors have fully availed themselves of the freedom so afforded them. It seems to us quite possible that, were not the nature of the show, or its contracted form, "I.H.E.," placarded everywhere in large capitals, people with only average acuteness might wander through the galleries, try the dinners, taste the coffee, and listen to the music, without it occurring to them that the object of all this was to preserve a *mens sana in corpore sano*, and still more easily might they go away without having mastered one theory or absorbed one fact towards so desirable a consummation. It is to be regretted that the sanitary and the unsanitary are not more generally brought into sharper contrast, so that the public might have brought home to them a knowledge of what to avoid and what to strive after. If such pointed contrast were not necessary there would be no occasion for the show which is now going on at South Kensington. For instance, London is one huge exhibition ever before our eyes, showing innumerable examples both of the observance and violation of sanitary laws; yet few of the millions who frequent it are inclined to distinguish the one from the other, or draw for themselves a profitable lesson. Although there is much that might be improved in the method of instructing the general public, there is still much of great value to the diligent observer. Our object here is to touch on the subject of dress, and we think the department devoted to this subject is in advance of many of the others, in the lessons which it affords, and the manner in which they are brought before us. To begin at the feet, there is exhibited the skeleton of a natural foot, showing the beauty of its longitudinal and transverse arches held together by elastic ligaments, and which, by expanding as the weight of the body is brought upon them, prevent concussion, and give lightness to the step. Here also, it should be observed, that the great toe points forwards, and is not at all inclined towards the median line of the foot. By the side of this there is shown the plaster cast of a natural foot which has been allowed to arrive at years of maturity without having been deformed by the art of a fashionable bootmaker. Each toe is allowed to have an individuality of its own; it stands distinct from its fellow, is fairly cylindrical in section, and does not resemble the flag end of a "compressed" cigarette. In striking contrast with this is shown the cast of a foot which has been the victim of fashion, and which is, we fear, only an exaggerated type of the majority of feet in the civilised world. The great toe is so much bent towards the median line of the foot that it is forced beneath the adjacent small toes; there is partial dislocation at the last joint, with evidence that it has been the seat of a painful union. Then is shown an ordinary pair of fashionable boots, such as might have produced the deformity above described. The sides are sloped away symmetrically to the median line, where the boot has the greatest length, while the slightest reference to the healthy cast will show that the greatest length of a boot which fits should be opposite the first and second toes. By the side of these is shown a pair of boots such as would suit the un-

deformed cast before described, and it will be observed that there is plenty of room at the toes, and that the inner sides of the boots are almost straight; in fact, the toe of a sanitary boot ought more nearly to resemble a right-angled than an equilateral triangle, but the apex of the triangle is not required. Mr. Hall exhibits a boot of the Elizabethan period, which well illustrates another monstrosity existing at the present day. Here the heel of the boot is not placed beneath the heel of the foot, but almost beneath the crown of the natural arch, so that the advantage of its elaborate mechanism is entirely lost. This folly is perpetrated with the view of making the foot appear shorter than is really the case. The heel above described is not only misplaced, but also extremely high, and the evil results are many. Thus the weight is, to a great extent, shifted from the heels to the toes, forcing them into the ends of the boots and intensifying the evils caused by their narrowness, greatly increasing the risks of sprained ankles, and putting much extra strain on the muscles of the legs to maintain the body in its unnatural position. Before leaving the boots we may mention that Mr. Larsen exhibits some thick horsehair socks, which, being porous, elastic, and non-conducting, ought to be useful in preventing blisters and in minimising the risk of catching cold from wet boots.

The "Indestructible Boot Company" exhibit an ingenious metal sole, with projections or teeth, which are forced through the leather sole of its deep surface. It is claimed for them that they cause the sole to be very durable, and they certainly give it a substantial appearance, as the teeth show on the surface like so many nails. Experience, however, must decide whether they have the result of making the sole too rigid. Proceeding from the boots to the socks we find that a company for carrying out the designs of Dr. Jaeger, of Stuttgart, show some digitated socks. It is doubtful whether the public generally will be brought to adopt socks of this construction; for they must be rather more troublesome to put on, and keep in repair, besides having the result of making necessary a slightly wider boot; but there is no doubt that they are a step in the right direction, for they will help to absorb moisture, prevent the accumulation of secretion between the toes, and promote cleanliness in every way. This company also shows various forms of woollen underclothing, which appear to be of excellent material. Wool is certainly the best practical material to wear next the body, as it is porous, absorbent, and non-conducting. Unscientific people generally imagine that clothes make them hot. Such, of course, is not the case; they merely prevent the rapid transference of heat from the body to the surrounding atmosphere. For this reason it is evident that a non-conductor like wool is a good substance to wear even when exposed to the direct rays of a fierce sun; for it tends to prevent the heat from reaching the body, and so injuriously affecting its temperature. A popular illustration of this is in the storage of ice; for we wrap ourselves in a blanket to keep us warm, and we wrap ice in a blanket to keep it cold.

Mr. Lewis, of Cheapside, also shows some woollen underclothing of very fine texture; he claims that it is unshrinkable and very durable. Amongst the things shown which we hope may attract the attention of ladies, are two plaster casts of the human liver. One is that of a healthy liver of normal size and shape, such as might have belonged to a Venus, and the other of a liver such as might belong to many a dyspeptic lady whom one meets every day. It is much reduced in size, distorted in shape, and is marked with a number of parallel grooves showing where the ribs have been forced into its substance by the pressure of a fashionable

corset. It would be unreasonable to suppose that such a liver would properly perform its functions, the other organs would suffer correspondingly, and the owner probably spent a sickly life, perhaps was the mother of sickly children, heavily handicapped in the race of life; and all this that she might be able to say she had a waist so many fractions of an inch smaller than that of her friend Miss A.

Amongst modern hats we noticed a design by Messrs. Elwood & Sons, called an "evaporator." It is made of flannel, in shape like a truncated cone, with a sponge at the apex which is to be occasionally wetted with water. It is intended to be worn in the top of a ventilated hat, so that the vapour given off by the wet sponge may keep the inside of the hat at a low temperature. In the room especially devoted to ladies' dress, there are shown some sanitary stays, which are less rigid and injurious than those generally worn, also various forms of woollen underclothing, and amongst them "combination" garments which are supported from the shoulders, and so relieve the overburdened hips. The "Suspenders" for avoiding the use of garters are to be recommended. These latter articles have very injurious tendencies, especially when worn below the knee. They hinder the return of blood from the legs, frequently make the feet swell, and are powerful among the various causes of varicose veins.

Passing to the Quadrant devoted to historical dress, we may congratulate ourselves that the dresses of our ancestors, though more picturesque, were not generally ahead of our own in practical use. With the exception, however, of some in the time of Edward IV., and those having the toes chained to the legs, the boots are for dry weather more adapted for comfort than those of the present day, for they seem to have been fitted to the foot instead of the foot to the boot as is now done. In military dress, the modern improvements are very marked, especially during the last few years, and we believe it is intended that the army shall shortly have a uniform which is not best calculated to make them conspicuous to the enemy.

BELGIUM.

THE catalogue for this section (which occupies a large annex between the Aquarium and Queen's Gate, having greater space allotted to it than that claimed by any other foreign country) is not yet issued, and consequently there are many points which are apt to be overlooked, but by the courtesy of those connected with the Belgian Commission we have been enabled to derive considerable information from the carefully-displayed exhibits, which are of unusual excellence and interest. As a contrast to our own neglected "school" division, we find that this is nearly all "school," and illustrated most thoroughly from first to last, and, taken in conjunction with the recent report on technical education, affords a good study, and leaves the impression that we have much to learn as regards the general question of education, whether technical or otherwise. We will, however, start with the subjects as they are arranged, and begin with the small selection of glazed drain-pipes shown by M. Joseph Gibon, of Brussels, who has a few earthenware pipes of a darker colour than usual, and the ordinary bonds and syphons, although the intercepting and trapped syphons to which we are accustomed are apparently not known; the prices are also given, and a 10-centimetre pipe, which corresponds to our 4-in. pipe, is given at one franc per metre (about 3 ft. 3 in.), which is certainly cheaper than we can produce them here.

Some really excellent woodwork for internal finishing is shown by "La Construction Industrielle," walnut and oak in chimney-pieces and panelling of good design and workmanship, more especially the panelled door and over-door at the back of their space, which will well repay a close examination. Some of the same material worked in a different form is sent by M. François Rosel, 16, Rue Neuve, Brussels, whose cabinets and furniture of fumigated oak in imitation of the antique are very fine specimens of work. There is a Florentine tendency in the detail, and a careful avoidance of any harshness or crudeness which is so often noticed in old examples and which, in a material like oak, capable of close manipulation, is never called for.

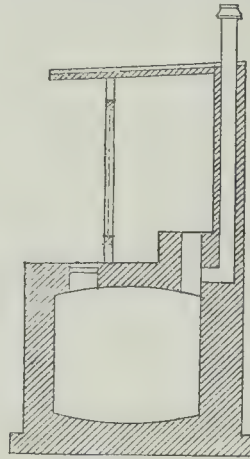
M. Leon Boucneau sends some Belgian marble in the form of chimney-pieces, rather hard in outline and detail, but of good workmanship, and near these are some chimney-pieces of statuary and sienna by M. Evrard Leonco, 170, Chaussée d'Anvers, Brussels, which are delicate and fairly designed.

We now turn to a very different subject, of which we should much like to have seen more, viz., "housing the poor" in Belgium. "Des Habitations Ouvrières," by M. Dr. Lebon, is a pamphlet explaining the working of the "Bureau de Bienfaisance de Nivelles," whose efforts appear to have been on a small scale, but yet very successful. It is the principle of a building society applied to artisans' dwellings, by which means the thrifty artisan is often enabled to acquire his own tenement. There is an elevation given of a two-storied building containing twelve sets of rooms, and, although there is no plan attached, it can be gathered sufficiently near from the accompanying pamphlet, which is chained to the drawing. On the ground floor is a kitchen or "chambre de réunion," 15 mètres superficial, which, in English measurement, would be as nearly as possible 13 ft. by 12 ft. 3 in., a water-closet, and a lobby opening on to the staircase; on the top floor are two bedrooms with separate entrances. The cost of the twelve houses is given at 19,457 francs, or 1,621 francs each. These are let at an annual rent of 64 francs 86 centimes, and a monthly payment of four francs is exacted by the "Bureau" towards an accumulation fund to allow the occupier to become the proprietor, and the inhabitant in each of these instances already has thus saved 1,400 francs. In addition to the rent the "locataire" pays a ground-rent of 2 francs 25 centimes, 48 centimes for insurance, and 7½ francs for maintenance; and, as the Bureau is limited to a 4 per cent. profit, a fair working margin is left. These figures are also much lower than we are accustomed to, and the cheapness of material and labour, added to the small cost of the land, give a good start to schemes of this kind, and make it difficult to form a comparison with our big efforts. We shall probably make further reference to this system later on when we are in possession of further information, which we hope soon to obtain.

A large number of important buildings next claim our notice. These are "Les Écoles Normales," or schools supported by the State for the instruction of the Instructors, male and female; and we at once see the rapid advance made by the Belgians since 1878, when the question was taken in hand by the Government under M. Germain. The school at Bruges is thoroughly typical of sixteenth-century Belgian architecture, with the usual brick surface tracery, much the same as a great deal which already exists, and which has been used in many modern buildings in their principal towns; it is not by any means a vigorous design, and it seems impossible to infuse much vitality into this style, which is probably the result of economical building; and moreover, like all State-aided productions in this direction, it is the "safe" line that is followed. The Ville d'Anvers is a thoroughly French example, such as we see in the "Moniteur"; it is a good drawing to a very large scale, and the warming, ventilation, and drainage are carefully shown. In this, as in other instances, the sewerage arrangements are somewhat unusual, and the water-closets, which are external, are treated as a separate feature, of which the following description and diagram will give a fair idea.

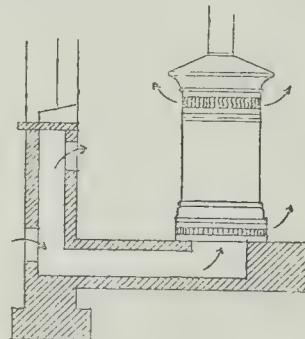
It will be seen that the sewage flows direct into a "fosse," or cesspit, which is ventilated into the open air by shafts or chimneys above the roof of the low building, which contains a long range of these closets, and through which

we have taken the section; but whether this system is worth following is a moot question. The school at Tournai, of which the cost is given at 1,000,000 francs, is a nondescript design of a poor and commonplace character,

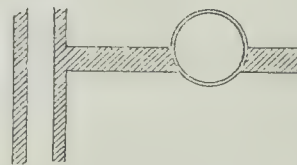


Section.

showing nothing special about the sanitary arrangements worthy of notice. The "École Normale" at Namur is a large building, shown by a French fine-line drawing, simple, though not wanting in dignity, and shows the academic training of the designer. A very bright, bold, and small drawing shows the Free School at Louvain, where the fosse system referred to is again to be seen. Another bright little drawing of the "École Gardienne" shows an ingenious arrangement for heating, viz., the hot-air stove is built into the wall which divides the classroom from the play-room, the hot air being given out on each side; one stove thus serving for two rooms, as will be further explained by the sketch.



Section.



Plan.

The "Kindergarten" system is most thoroughly carried out in the communal or elementary schools, and the various ingenious appliances will be seen exemplified; while the processes of manufacture, from the raw material to the finished article are shown by samples in each stage, such as the manufacture of paper and cotton. The making of beer is traced from the condition of barley to malt, the addition of saccharine, &c. The children are taught to take an interest in history by means of well-drawn portraits of the principal characters, beginning with Ambiorix, whose time was

principally occupied in fighting Julius Cæsar, when that worthy was not engaged in writing or fighting against us. Philip van Artevelde, who brewed sedition as well as beer, and suffered accordingly, is also depicted in good drawing, and this is carried through generally in such a manner that the pupils cannot fail to look upon their work as full of interest. Geography is represented by good maps and taking pictures of the Roman Forum, Bay of Naples, New York, Constantinople, or Athens. Drawing, which they begin to learn at six years of age, painting, sculpture, architecture, archaeology, mineralogy, music, and botany are equally well represented, although the buildings in which these pleasant subjects are taught are, to judge by the numerous photographs, of rather dreary aspect. Some school benches, desks, and ordinary fittings and appliances are also given, but as they do not vary much from those in vogue here, and, indeed, are scarcely so good or various as ours, it is unnecessary to do more than mention the fact. So much for the State or "Liberal" teaching in contradistinction to the Church or Conservative section, of which the leading spirit is the "Institut des Frères des Écoles Chrésiennes," which has its own institutions, and in which technical training seems principally directed towards ecclesiastical building and decoration of rather a poor and thin type, which same character applies to "St. Luke's School of Art," which appears to be their "South Kensington," where we find portfolios of drawings and designs of all kinds and in all materials, some of which are fairly good, but generally are of the "cast-iron Gothic" order, and against which we certainly can more than hold our own. The "Académies des Beaux Arts," as might be expected, are strong in studies from the antique, drawings, casts, and busts. The Carlsbourg Normal School, being mechanically-minded, sends some well-executed drawings of machinery and construction, as does also the "École Industrielle" a Gand which shows a piece of hand-woven tapestry and specimens of lace. The five orders and relative details, in well-drawn perspective, also appear in another section, of which the school at Malonne is an exponent. It will be noticed that nearly all these drawings are in pencil and colour, very little ink being used, as this latter method is often unsatisfactory, and leads to considerable hardness, besides occupying unnecessary time. The "City of Antwerp" naturally takes great pride in architecture, and illustrates it in many ways, and when the catalogue of this division is complete it will greatly add to the interest of a good representative exhibition.

SANITARY FITTINGS.

RESUMING our notice of the exhibits in the Eastern Annex, we may note that Messrs. J. G. Stidder & Co., of Southwark (Stand 534), have a very varied and complete display. Their improved valve closet, with patent overflow trap and ventilating junction combined, has much to recommend it. It is an improvement on Underhay's valve closet. The "Ultimatum" trapless closet and Stidder's treble-flush "Torrent" closet, are also worth the attention of visitors; the first named is made to work with an open soil-pipe, the mouth of which must be carried above the roof-top. The patent trapped "Universal" valve closet is another speciality at this stand. A tip-up lavatory of exceptionally strong make suitable for use in schools, is worth notice; also Stidder's patent tip-up lavatory, in which the water enters the basin through the pivots or runnings, hot water on one side and cold water on the other. A concealed wall urinal, the act of opening which turns on the water, exhibits marked improvements on earlier attempts at this form of contrivance. A good display of plumbers' brass work is made by this firm. Nor must we omit to mention their cast-lead pipe tacks for securing soil and other pipes to walls. These tacks may be made of an ornamental character to any design, and when soldered at intervals to the lengths of pipe afford a ready means of fixing. A wash-up sink, or trough, made either in galvanised iron or pine, is a very handy contrivance, serving a multitude of purposes, whether placed in a butler's pantry or a cottager's kitchen.

Moule's Patent Earth Closet Company (Limited) show, at Stand 535, their earth-closets and commodes, which are too well known to need more than the mention of the fact that

they are here. They do not provide for the disposal of house-slops, but for this purpose may be supplemented by one of Field's self-acting flush-tanks placed below the garden level for the reception of the slops, which are discharged from the tank by syphon action, and their contents conducted into the earth by means of agricultural drain-pipes. Properly carried out, this system of earth-closet and slop-tank affords, in small country places, an efficient substitute for drains and sewers.

At Stand 536 Messrs. Sharp & Co., of Holborn Circus, are exhibitors of the "Banner" patent water-closet and of ships' and earth closets, which appear to be serviceable and good. Ventilators and means of ventilation should, of course, play an important part in every sanitariously well-ordered building, and they are represented at this stand by Thomas Boyle's ventilators. But we purpose speaking of ventilating appliances in a separate article.

Stand 537 is occupied by the Austin Antiseptic Company, whose speciality is a small porous vessel which, charged with Condy's fluid or other disinfectant, is suspended or otherwise fixed in the water-waste preventer or flush-tank, so that the water using for flushing purposes becomes impregnated with the antiseptic material. This is, as it appears to us, a very good way of effecting the end which was aimed at by an apparatus already noticed, and in certain situations may be used with advantage, although, as we have before pointed out, sanitary fittings should not be dependent upon such aids for keeping them sweet.

Stand 538 is occupied by the Bower-Barff Rustless Iron Company, who show iron castings for sanitary purposes, treated by their processes. There is a wide field for the employment of this process, which, although largely used, is not yet generally known. We learn that furnaces capable of treating about 15 tons of mixed castings per week have been erected near Bankside, Southwark, and are now in daily operation. There is, unfortunately, a limit to the size of the articles capable of being treated by this process. No piece must exceed 12 ft. in length or 3 ft. in depth and breadth.

On the large and well-displayed stand (539) occupied by the well-known firm of John Bolding & Sons, are to be seen several specialities. The first thing we noticed was a very cheap and apparently strong and serviceable bath, made of stout zinc, japanned inside, and painted externally. It is mounted on feet, so that no casing or boxing-in is required. Some good tip-up and other lavatories displayed on this stand will bear inspection. Special attention may be directed to a lavatory, water-closet, and bath, fitted *en suite*. This firm are also exhibitors of some very good water-closets, both of the valve and wash-out type. Amongst them we may name Bolding's "Simplex" valve closet, in which the pipe supplying the overflow trap (at each flush) when empty serves as an air-pipe, and prevents the overflow trap being syphoned out. This closet is provided also with a ventilating pipe for ventilating the valve-box. A new valve-closet is shown, fitted with Truss's patent water-waste preventing valve, which is ingenious, though simple in action, and gives a good flush and after-flush. Visitors interested in such appliances should not fail to see this. Bolding's "Grosvenor" or "disconnected overflow" valve-closet has some very good points, having been specially designed to prevent the escape of sewer-gas into the house. The overflow is carried by a separate rim to the back of the closet, from which it is completely disconnected, and may be made to discharge in the same way as the ordinary cistern warning-pipe or overflow, or a pipe may be carried down to discharge over a gully or in any other convenient position. The "Alliance" wash-out closet, with front outlet, shown at this stand, is very efficient. A housemaid's slop-sink is shown, so fitted as to be portable,—"a tenant's fixture," in fact, like the bath already mentioned. In the Water Companies' pavilion, Messrs. Bolding & Son have a special display, to which we propose calling attention hereafter.

At Stand 540, Messrs. Capper, Son, & Co., of Ingram-court, Fenchurch-street, show their well-known twin-basin water-closets, and their very handy fold-up lavatories. Of the merits of these we have spoken on previous occasions. Some good tip-up lavatories, with pivot water-supplies,—hot one side, cold the other,—are to be seen at this stand. A speciality at this stand is the "patent pivot high-pressure water

filter," which is so small and portable as to be easily soldered on to the nozzle of an ordinary house-tap. It pivots back when the water drawn from the tap is not required to be filtered. The filter consists in brief of a reversible cylinder filled with animal charcoal and asbestos. The process of reversing the cylinder causes the filter to be self-cleansing, and the cylinder can easily be refilled when necessary. It is claimed for it that it will continue in work for years without this being necessary. The water is not kept standing in the filter.

Messrs. Beck & Co. (Limited), of Southwark (Stand 541), have a very excellent display. One of the principal exhibits at this stand is Bell & Wheatley's patent syphon cistern for flushing closets, urinals, and for other sanitary purposes. This is strong and simple, has no valve (except the ball-valve), and is suitable for high or low pressures. The syphon discharge is set in motion by the depression of a loosely-fitting piston or plunger working in a cylinder. This cistern is one of the best of its kind. Beck's patent side outlet valve closet, with galvanised iron trap above the floor, is shown in combination with Bell & Wheatley's water-waste preventing apparatus. Beck & Co.'s flushing-rim closet basin and trap, and their elastic valve closet, are shown in action. Some good brasswork is shown at this stand, including valves, hydrants, gun-metal cocks and valves, and water fittings generally. Bell's patent double valve stopcocks, for connecting house services with mains for constant supply, meet the requirement very satisfactorily.

Some other exhibits in this annex, as well as others of a kindred character scattered about in other parts of the Exhibition, we must notice in a further article, but before breaking off this week we will deal with the stand of another well-known exhibitor.

Mr. Henry Conolly, of Hampstead-road, occupies a very prominent and attractive stand (No. 375), in the Central Gallery. The fitting up of the stand itself is worth notice in passing, the Pompeian decorations of the specimen bath-room, which forms part of the exhibit, having been done by Messrs. W. Phillips & Son, of Baker-street. The ceiling is ventilated by means of a perforated cornice, the apertures in which lead to a rarefier, so as to facilitate the carrying off of the steam and vapour of the apartment. The bath is of what Mr. Conolly calls the "Acme" type, and in fitting-up and arrangement it certainly leaves nothing to be desired. The cabinet-work of this bath, and of the lavatory and toilet-table shown *en suite*, is of American walnutwood, with ambony wood mouldings, and Talyha-wood panels. The "cork parquetry" with which the floor is covered is a material admirably adapted to its purpose. The lavatory is provided with a very complete shampooing apparatus. A combined fold-up lavatory and urinal shown on the stand is likely to be found very handy where space is limited and where slightness is essential. In an adjoining compartment Mr. Conolly has a variety of his specialities in water-closets and urinals. His "Nestor" valve-closet, with self-trapping overflow, embodies an improvement of value. Conolly's "Automatic" water-waste preventer, for flushing closets, urinals, &c., is, as we have said on previous occasions, a very good one. Some earthenware oval and circular lavatory basins, for corner and other positions, are worth notice. Demarest's patent wash-out closet (an American invention, we believe), is shown in action. Among other specialities at this stand are some good cast-lead rain-water heads, which, with a specimen of cast and sheet lead, merit the attention of visitors.

SANITARY HOUSE CONSTRUCTION, DAMP - PROOF AND FIRE - PROOF BUILDING MATERIALS, &c.

CLASS XXVIII, Group 3, or the Dwelling-house, is intended to show the materials of sanitary house construction, relating to roofs, walls, damp-proof solid floors, damp-proof wall coverings, cements, &c.; and further, this class includes a number of exhibits bearing upon fire-proof buildings. There are, however, a number of objects in the class under notice which, though appertaining to house construction, and in one sense sanitary and even artistic, properly belong to other classes in the same group. Some of these we have referred to in a previous notice. It is difficult, we know, in some cases

to discriminate or separate one kind of object from another of kindred nature to it, but it is to be regretted that a large number of objects should be allowed so often to overlap each other, and otherwise to become dispersed in other classes, at a distance. Concentration, save to a limited extent, has not been a leading feature in the present Health Exhibition, and hence a considerable amount of trouble is experienced by the professional or practical man who desires to examine, as well as see, a distinct class of appliances or materials in connexion with improved house construction. A new invention, material, or mode of construction, stated to possess advantages over one previously in use, of course interests the architect, engineer, builder, and intelligent workman, not to speak of others concerned more or less in house building and repairing. Thus the concentration of a certain class of exhibits is highly desirable. We will, however, now proceed to give some particulars of the showest and the more important of the exhibits of Class XXVIII.

Messrs. Chambers, Monnery, & Co., of Bishopsgate-street (Stand 797), show among a number of other articles a section of hollow brick wall *in situ* to illustrate their patent cast and wrought iron wall-ties built in position. Two courses of bricks with a hollow space between equal to the thickness of a brick, are connected with a series of iron ties at intervals. The tie at either end is in the form of a dovetail, and these dovetail ends built into the course of brickwork strengthen the construction. The central portion of the wall-tie, of course, stands in the hollow space between both courses of brick, but being of thicker make than the dovetail ends, and being also shouldered on each side, it acts as a good stay. The walls can overhang neither outwardly nor inwardly, and in addition a dry wall is secured. Different forms of wall-ties are shown. The kitchen sink adapted for artisans' dwellings, and the kitchen range as used in improved workmen's dwellings, will fairly meet the required wants. The Midland Rustless Iron Company, Wolverhampton (Stand 798), furnish some goods of a noticeable kind. These include enamelled and decorative plates for fireplaces, and overmantels, together with tile hearths, displaying decorative painted panels. A number of castings illustrate parts of filters, cisterns, meters, lavatory apparatus treated with what is termed "unfoulable enamel." Next we have hygienic enamelled wrought and cast iron baths, pans, &c. The exhibits, as a whole, are well turned out.

The Crystal Porcelain Pottery Company, St. Bride-street, E.C. (Stand 799) had no objects on view on the occasion of our visit. Three weeks have been allowed to pass, and yet not one object of any colour or form was on view at the beginning of the present week. Mr. R. Helbronner, Oxford-street (Stand 800), has on view some exhibits professing to hermetically exclude draughts by the expedient of a flexible cotton tube and grooved heading. These draught-excluders are intended for French or casement windows, bottoms of doors, &c. The cotton tube or riband is inserted in some instances into the stops of doors or windows; and, in other instances, the draught-excluder is fastened on the flat surface instead of into a groove. Under some conditions they will answer fairly well, but in other cases they will not have the utility of elastic or india-rubber heading. As to the word "hermetical" in relation to excluding air it is a folly to suppose that people could live in houses with the air absolutely excluded from passing through or around the sides of doors or windows into the room. It is proper to exclude draughts, but not pure air, but some nervous folk carry their craze so far that they cork up the key-holes of their doors and would lead one to suppose that ventilation and draughts were identical terms.

B. Cannon & Co., Lincoln (Stand 801), exhibit specimens of two very useful materials,—concentrated size, and glue powder, for painters, decorators, carvers, gilders, and other trades. The former only requires a few moments to prepare it for use, and already its value appears to be appreciated by its large consumption throughout the country by builders, painters, decorators, paper-hangers, and others. Mr. John Matthews, Royal Pottery, Weston-super-Mare (Stand 802), as usual displays a good assortment of his well-known pottery, patent bonding roll, square and curved roofing tiles, terra-cotta objects, special ridging

bases, finish, &c. We have, on sundry occasions, spoken favourably of this ware. Messrs. Diespeker & Co., Holborn, E.C. (Stand 803) show specimens of Roman and Venetian marble mosaic objects for floors, doors, dados, and wall coverings, which have already been incidentally alluded to in a former notice from a decorative point of view. From a sanitary and constructive aspect we may add that the mosaic is non-absorbent and damp-resisting, and will last for very many years indeed if not subjected to exceptionally rough usage. Messrs. Charles Drake & Co., Battersea Park, S.W. (Stand 804), display, in addition to mosaic facing bricks and fire-resisting fibrous-plaster slabs, some fire-proof concrete floors, stairs, doors, concrete moulding, together with a concrete building apparatus. On a former occasion at more than one building exhibition we have described Messrs. Drake's exhibits in detail. Of fire-proof construction in relation to some exhibits in the class under notice, we may say something further on. Mr. Joseph J. Ellis, of the Ellistown Brick, Tile, and Fire-Clay Works, near Leicester (Stand 805), exhibits red-clay and fire-clay ware, cut, hand-pressed, facing, ornamental, and variety of other goods, including crucible and cement glazes. The articles, as far as we had time to examine them, are of very good manufacture. Mr. Foot, of Wellington, Somerset (Stand 806), presents some novelties in bricks, a speciality being those for damp-proof walls. The bricks in some cases, according to the work for which they are required, are made to dovetail into each other. In some bricks, the pins and the tails are moulded into the bricks, and in other cases tails or openings are in both bricks, allowing for a cast or wrought-iron dovetail pin to be dropped between even with both bricks. The tiles intended for paving purposes are similarly prepared for joining, but in respect to the bricks there is an allowance for an open space between. The damp-proof bricks will, to some extent, fulfil the intention that suggested their manufacture. Messrs. James Stiff & Son, Lambeth (Stand 807), exhibit in this class and elsewhere in the building an assortment of fire-proof terra-cotta ware, ventilating bricks, damp-proof courses, and terra-cotta articles for architectural ornamentation, unexceptionably good of their kind. It is not necessary to enlarge on the merits of the goods of this old-established firm.

Perhaps it will not be amiss at this point to say a few words about the class of damp-proof and fireproof exhibits, some of which have been already noticed. We find in Class XXVIII. a number of composite materials intended for damp-proof and fireproof construction, but although some of them are very serviceable, it would be wrong on our part to say that they fully meet all the requirements sought in their application. A few of these damp-proof methods and processes have been for some years before the public, while others have been only recently introduced. In some cases a fair measure of success has attended their application, and in other instances a very partial one; yet time, in respect to the latter, may show better results. Then in regard to fire-proof construction or building, the word "fireproof" is only a relative term, and it must not be understood to mean that the material or the building to which we apply it cannot be damaged or destroyed by fire. The result of all inventions and materials hitherto employed, certainly tends in the direction of greater safety, yet the sum total amounts to only diminished liability to damage by consuming fire. Some materials and substances are more readily destroyed than others, and the object of improvements in fireproof building should be to render materials at present easy of ignition, or of succumbing to fire, difficult to be set on fire. Not only has the saving of property to be considered, but the saving of life in fireproof construction. It is well known that the effect of strong jets of water on cast-iron and stone is to cause them to split and fly like glass, and it will also strip walls and ceilings of plaster with wondrous rapidity. Then comes the washing-out of the joints of the brickwork by some chemical action in the lime mortar, or, perhaps, by the mechanical effects of a sudden cooling. A sudden or unequal cooling will lead to the distortion of malleable iron. The effect of water on burning timber would be simply the stopping or delaying of the process of combustion if the water were efficiently applied. Of

course, also, water may cause special damage to goods. The stones in buildings more liable to destruction than others are limestones, or those made up of a combination of lime and other agents. But, indeed, the great majority of building stones are affected by strong heat. The class of building materials the most trustworthy (indeed, some of them thoroughly so) are earths and cements, supposing we use the term to comprise all mortars and concretes the materials of which do not include uncalcined limestone. In view of what we have stated, sundry of the fireproof building exhibits in Class XXVIII. should have their real value judged and estimated.

Hitchin's Fireproof Plastering Company, Greenham-street, E.C. (Stand 808), present specimens of half-timbered buildings, illustrating the advantages of Hitchin's patent improvements in plastering." It is stated to be fire-resisting, and good for staying the transmission of sound. It is also put forward as speciality for damp walls, and for casings for the protection of girders and columns from fire. The groundwork in this system of plastering is a wire netting, instead of laths. A number of plaster slabs or casings are also on view, and some *in situ*, showing the application to wall linings. A sanitary dwelling, erected not far off in the Exhibition building, shows the application of this system of plastering, and the work has a good appearance. Of its sound-staying properties we are unable to speak at present. Mr. Archibald Dawson, King William-street, E.C. (Stand 809), displays samples of solid floors, concrete-encased ironwork, and rolled joists and girders used in the construction of solid floors. Here we have on view samples of rough concrete in lump, iron girders and columns encased with concrete, rolled-iron joists, angle and tee irons, and other forms of ties and supports used in connexion with concrete and fireproof construction. The ironwork exhibits are of excellent manufacture, and the illustrations in concrete and iron are of a fairly satisfactory kind, considering all the belongings of fireproof construction and its present standard of execution.

Mr. Malcolm Macleod, Deansgate, Manchester, and Mile-end, London, E. (Stand 811), shows samples of his "metallic antiseptic" concrete, stated to be "proof against fire, damp, vermin, &c." There are also on view samples of natural and artificial asphaltes, for roofs, floors, pavements, and other purposes. An assortment of similar materials is shown by the Val de Travers Asphalte Paving Company, Old Broad-street, E.C. (Stand 812). These exhibits include samples of refined bitumen used in the manufacture of asphaltic materials; and there are models displayed showing the application of asphaltes to various uses in street pavements, roofs, foundations, damp-courses, &c. Mr. George Evans, Adelaide-street, Charing-cross (Stand 814), presents a solid wooden staircase, full size, with heads and risers covered, and a plastered soffit, also solid wooden floors, showing a method of forming ventilation. We cannot endorse the statement made on behalf of these exhibits that they are fire-proof and sound-proof, except to a limited extent. The work in itself, however, is creditable. Wilkes's Metallic Flooring and Eureka Concrete Company, Devonshire-square, Bishops-gate, E. (Stand 815). These exhibits have a former occasion been spoken of very favourably by us on the score of strength and finish. Among the present objects are fireproof floors, stable and basement floors, dressings for buildings and sewers in section. The manufacture is good. Mr. Thomas Wharam (Agents, Burke & Co.), Newman-street, W. (Stand 817), submits specimens of his patent wood-block flooring. The blocks are laid diagonally on a basis of concrete. Some of the blocks are of oak, and other specimens are a combination of oak and mahogany. This block flooring is a kind of parquetry work. It is apparently strong in construction, and we believe it would prove durable if always efficiently done. In this class Mr. Thos. Jennings, of Lambeth, S.E. (Stand 817), exhibits patterns of flooring specially prepared for hospitals and sanatoriums. The specimens are what is known as paraffined floors. The method of fixing the boards shows no nail-holes, but there is a tonguing. The paraffin dressing is stated to render the floors non-absorbent. Time alone can prove the utility of this method of flooring, which appears to be recommended by the medical faculty. Cognate to the last-named exhibits Mr. Charles Langstaff, M.D. (Stand 818)

shows a mel of a floor prepared with paraffin, a treatment which, it is said, he was the first to suggest. Hard paraffin is a white, solid, volatile substance not unlike white wax. To prepare it for application it is melted in an iron pot or earthenware vessel, and whilst hot is painted over a portion of the wood, then ironed into it with a box iron. The paraffin is thus driven into the wood, and a paraffin surface procured. The floor is prepared bit by bit at a time till the whole is completed. A floor surface results somewhat like a waxed parquetry floor. We fear that a moist cloth and a hard brush twice a week would fail to remove all the dirt that may accumulate where there is a good traffic over the floor. In the model of this floor the boards are laid diagonally, and their edges are bevelled to allow them to overlap. The nails are driven through the overlapping portion of each board. Even if the flooring boards were of hard wood, we do not approve of the bevelling of their edges, for reasons obvious to every practical man. Tongued and grooved boarding is the best, or a grooving run in the edge of each board, and a tongue of wood or thin iron inserted. Well-seasoned timber is indispensable, and, if time permitted, the permanent nailing down of the floor ought to be delayed for several months. On the same stand there is a model of hot-air disinfecting chamber, with bath and lavatory attached, intended for disinfecting the clothes and person of a nurse after nursing an infectious case; also a model of a ventilating apparatus for filtering air and charging it with chemical compounds. Messrs. Towers & Williamson, Adamantine Clinker Works, Little Bytham, Stamford (Stand 821), display their "Adamantine Clinkers" for "a solid sanitary floor." Whether these clinkers for paving will wear longer than any other, vegetable, absorb least moisture, and are therefore drier, than those now in the market, we are not at present prepared to say. From an examination, however, of these narrow paving bricks, we can say they possess extreme hardness, and they certainly have some qualities that ought to ensure them a favourable reception for use in stables, coach-houses, yards, abattoirs, markets, and other places.

Some other exhibits in this class must await a further notice.

We report on p. 819 of this week's *Builder* the first of the Conferences held in connexion with the Exhibition, and in our list of "Meetings" on p. 842 will be found particulars of next week's Conferences.

HEALTH EXHIBITION.

Group III. Class XXII. South Annexe.
BATTEN'S PATENT
SEWER VENTILATORS
AND MAN-HOLE COVERS.
No. 150, LOZELLS-ROAD, BIRMINGHAM.
[See May 31, p. xxii.]

BECK & CO. (LIMITED),
130, GREAT SUFFOLK STREET, SOUTHWARK, S.E.
AND 541, EASTERN ANNEXE
VALVES, HYDRANTS, METERS, STREET BOXES, ROAD
WATERING POSTS, PUMPS (Hand and Power).
Patent Water Waste Preventing Cisterns and Water-Closets.
Fire Extinguishing Appliances, &c.

Group III. Class XXV. No. 715, Central Annexe.
VENTILATORS for ROOFS of HALLS,
 CHURCHES, SCHOOLS, HOUSES, DRAINS, SEWERS, &c.
 W. P. BUCHAN, S.E. { 21, Beutrew street,
 Glasgow,

SEMI-VITREOUS WHITE and BUFF
FACING BRICKS, of pure Terra-cotta.
GRANITE VITRIFIED PAVING BRICKS, Buff and Grey, of
pleasing appearance and enormous strength.

CANDY & CO., Lim.	{	No. 11, Queen Victoria-street. Works, North and South Devon.
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THE COALBROOKDALE CO., Lim.
SHROPSHIRE and LONDON (Holborn Viaduct).
Stand 577, Class xxiv., &c., East Quadrant.

No. 714, CENTRAL ANNEXE
MEAKIN & CO. Baker-street, W.
 SASH PULLEYS, SASH FASTENER, AND
 NEW PATENT SASH FOR CLEANING.

LIGHTNING CONDUCTORS.
SANDERSON & CO. (Richard Anderson, Proprietor).
Contact is to the War Department.
Sole Importers of the Solid Copper Tape Lightning Conductors.
LEADENHALL HOUSE, 101, LEADENHALL-STREET, E.C.

EAST GALLERY, STAND 860.
WM. WOOLLAMS & CO.
 Original Manufacturers.
ARTISTIC WALL AND CEILING PAPERS
 f.c. from Arne
 No. 110, HIGH-STREET, near MANCHESTER-SQUARE, W.

GLAZED BRICKS.
 Situated 1942, East Central Gallery.
 The WORTLEY FIRECLAY CO. Elland-road, Leeds.
 Only award to English makers
 At International Mechanical and Sanitary Exhibition, 1881.

The Builder.

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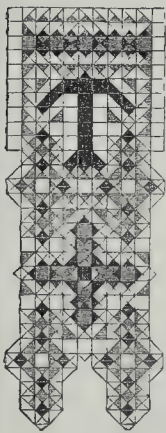
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Technical Education at Home and Abroad.

THE Royal Commission appointed in 1881 to inquire into the subject of the instruction of the industrial classes of certain foreign countries in technical and other subjects for the purpose of comparison with that of the corresponding classes in this country, and into the influence of such instruction on manufacturing and other industries at home and abroad, have presented a second, and very important instalment of their labours.

A preliminary report, issued several months ago by the Commissioners, among other matters gave an account of the primary instruction of France, but in the present report, Part I., the general scheme of education on the Continent is dealt with, being an introductory account of primary and secondary schools in France, Switzerland, Zurich (town and canton), Germany, Austria, Belgium, Holland, and Italy. In this first portion the special trade and technical schools abroad are described under five divisions, comprising every school available for artisans, artisans' general technical schools, and apprenticeship schools, intermediate technical schools for foremen and technical departmental managers, women's trade and professional schools; and, fifthly, higher technical instruction for employers, managers, &c. The first part concludes with an account of art - schools, galleries, and museums. Part II. comprises visits to industrial establishments, with some details of the work essayed and accomplished in them. Part III. deals with various educational institutions, science and art schools, colleges, museums, and workshops visited in the United Kingdom. In Part IV. we have the Commissioners' conclusions, with comparison in respect to home and foreign methods, the state of matters as regards Ireland, agricultural education, and the final "Recommendations" of the Commissioners. Of a report or reports dealing with such a wide and varied range of subjects, it would be impossible in any one or two articles to do more than present the reader

with a few of the chief bearings of the inquiry with regard to technical education of the workman and its influence on the future of our British industries. In France at present instruction in the use of tools is becoming general in the primary schools, and this system may have good results, as in some countries the working classes receive the only educational training on which they have to depend for life in the primary schools. In the secondary schools in France the instruction is still mostly on the old classical lines, save in some of the Lycées; additional time is given to mathematics in the last two years by boys intended to enter the higher technical schools. In regard to the higher elementary schools a relatively smaller number of youths are prepared for those of the higher type, but some of them appear to be secondary schools. The physical sciences, chemistry, &c., form subjects of instruction here, and a considerable time is given to them, and these institutions are furnished with excellent laboratories. The Commissioners admit, speaking generally, that the ordinary schools of France excel ours as a preparation for the technical school. In the primary schools greater attention is given both to geometrical and free-hand drawing, the latter being entirely from models, and there is also instruction in the use of tools. Again, the advantage in regard to the secondary schools is in the giving of more time to mathematics, especially in the upper classes of the Lycées. A knowledge of drawing is necessary to workmen in nearly all crafts, but it is indispensable to building workmen, and we have never ceased in this journal to keep the fact before the country. The school system of Switzerland must be judged by that which obtains in Zurich (town and canton). As in other parts of the country the elementary and secondary education is gratuitous, and the first-named compulsory. The system embraces primary, secondary, evening, and high schools. All children between six and fourteen years of age must attend school, and have to remain in the primary school until the age of twelve. Swiss children, however, usually attend the Kindergarten schools from the age of four to five, conducted according to the system of Froebel, but the attendance is optional here, and these schools have no State endowment. Children on leaving the primary school at the age of twelve, can either attend the secondary school or they may, subject to the prescribed attendance at a supplementary school, begin practical life. The course in secondary schools extends over four years, and those entering such schools, and remaining in

them for two years, or until fourteen years old, are free from further school attendance. As a contrast with the cost of School Board buildings in London, we may mention that the Zurich elementary school building amounted to 43,000*l.*, or 66*l.* per head. Irregularity of attendance is unknown; all children learn one foreign language; all are taught drawing, and have object lessons in natural history. In the higher classes there is rudimentary instruction in chemistry, and museums form a noteworthy feature in the Zurich schools. The higher schools in the canton comprise the gymnasium or classical school for preparing for the University or the Polytechnic and the Trade School (Industrieschule) which prepares for the Polytechnic or for direct entrance into trade. The Trade School, which is entered at the age of fourteen, comprises four classes, extending over three years and a half. The first being a preparatory one. There are two divisions or wards from the secondary schools, a technical section and a commercial one, the former again dividing in the third and fourth years into a mathematical and natural science section. The commercial section ends with the third year. In the cantonal school, consisting of a gymnasium and a trade school under the same roof, the teaching of the highest class is in advance of that found in smaller schools in the country. In connexion with the physical collections is a small workshop containing a water motor for working the dynamo and used for the repair of apparatus, &c., but only by the teacher and his assistants. Drawing forms an important feature of the instruction of this school, an average of six hours per week being devoted to this subject. The influence of such schools on the industries of Switzerland must be great. There are middle-class private schools in England, and their name is legion where drawing, or rather copying, occupies attention merely for one hour on one particular day in the week. In Germany, as in Switzerland, education is compulsory. With the exception of those children who are preparing for the higher secondary schools, all classes of the population are educated in "Volksschulen" or public elementary schools. The children enter at six and remain until the age of fourteen. Most of those intending to pursue their education in the secondary schools enter a preparatory school in place of an elementary, generally leaving that school at the age of nine or ten. In most parts, the secondary schools consist of higher elementary and secondary schools proper. There are three kinds of secondary schools in North Germany, the Gymnasium or Classical

School, the Real Gymnasium, in which Latin is taught, but not Greek, additional time being given to science and mathematics, and the Ober Real School, where a still greater amount of attention is devoted to drawing and science, the modern languages being substituted here to the entire displacement of Latin and Greek. The complete course of instruction in any of these schools occupies ten years. Pupils who have obtained the leaving certificate from the Gymnasium are entitled to enter any of the faculties of the University or the Polytechnic schools. There are sundry other schools in Germany under various designations. Modern languages, mathematics, and science, though forming the main subjects of instruction in the higher Real Schools of North Germany, yet it appears that but few of these schools are fitted with laboratories. Secondary as well as elementary schools are under State supervision, and the system of instruction in the schools of the same grade is practically the same. The communes or municipalities entirely support the primary schools within their district, save in the case of the very poorest communes, which receive some aid from the State or province. In many districts or large cities primary education is entirely gratuitous, and in nearly all primary schools the fees are extremely low. So the children of necessitous parents in all cases are enabled to receive free education. With scarcely an exception, the schools are day schools, and throughout Germany secondary private adventure schools are practically unknown. This is quite unlike the system that obtains in the United Kingdom, where private adventure schools are very numerous, although yearly a great reduction in their number is taking place. The Commissioners, in remarking upon the extent of secondary education in Germany, avow that secondary instruction of a superior kind is placed within the reach of children of parents of limited means, "to an extent of which we can form no conception in this country." In Austria the elementary schools are of two grades, lower elementary schools with three classes chiefly in villages, and higher elementary schools with four grades. The higher schools have six or seven classes. Although lower elementary instruction is compulsory, compulsion does not exist with respect to attendance at the higher elementary schools. The middle schools, like those of Germany, comprise Real schools, Real gymnasia, and gymnasia proper; and the high schools include universities and polytechnic schools. There are also infant, orphan, and convent schools, special schools for the blind, deaf and dumb, and seminaries for teachers. Though the infant schools are supported partly by the commune, and partly by private societies and by manufacturers, and proprietors of industrial establishments, they are under State supervision, but they receive no Government grants. Every higher elementary school has in connexion a continuation school at which attendance is compulsory for those children not attending a school of a higher grade, from the time they leave the primary till they reach the age of fifteen. Poor children have their school fees remitted. The fees vary from 1s. 8d. to 6s. 8d. for those who can pay. The continuation schools are partly maintained by the State. Children who wish to carry their education further leave the primary school at twelve, entering the fourth class of higher elementary school, from which they may pass to the gymnasium. The Real school is one of the special schools of a professional character. The secondary schools of Austria are similar to those of Germany. Some of these intermediate schools visited by the Commission in Vienna are carried on in magnificent and well-appointed buildings, having excellent teaching apparatus, and well-equipped laboratories. The gymnasia are either public or private institutions, the Real school being often partly supported by the State and the commune. In Belgium school attendance is not yet compulsory, but there must be at least one public (Government) school in each commune. Gratuitous instruction can be demanded by parents, and some communes make their schools free to all. There are a number of clerical

schools in Belgium. The Government schools are inspected by Government officials, who have no right to enter the clerical or private schools. It is open to all to establish schools of every kind, the principle of freedom of instruction is carried so far. It is stated that 30 per cent. of the total adult population of Belgium at the age of conscription can neither read nor write. The statement that 60 per cent. of the children of school age (six to fourteen) in Belgium are in the Government schools, 25 per cent. in clerical and private schools, and 15 per cent. not attending school at all, are statistics not admitted by the clergy, who state that they have 40 per cent. of the children in their schools. Belgium has no factory laws, hence children may be employed at any age, but public opinion has greatly restricted the employment of children to the age of twelve, and proprietors of factories often establish half-time schools. The cost of public primary education is defrayed in about the following proportions:—By the commune, 33 per cent.; province, 17 per cent.; the State, 50 per cent. As regards secondary education in Belgium, the Government intermediate schools are of two classes,—the higher elementary or middle-class, where the fee is 2l. 8s. per annum. The secondary schools or Athénées have a fee of 4l. per annum. The town usually provides the building,—the State making up the difference between the fees and the cost of teaching. Many scholarships exist from the primary to the middle-class schools, and preparatory schools are attached to the latter. The education of middle-class children is usually completed in the higher middle school, which is entered at nine and left at fourteen to sixteen years of age. Now, in Great Britain and Ireland, formerly parents and masters were interested to see the youth apprenticed to a trade at fourteen, so that his seven years servitude would end when he reached his majority at twenty-one years of age. The preparation for the Athénée in Belgium is usually in private schools or by home teaching. The institution is divided into two branches, literary and scientific and professional, and in each of these there are seven classes, but no Latin is taught on the professional side. The Government Athénées, or day schools have boarding-houses attached to them in large towns. There are numbers of primary and secondary schools under the clergy in which the education is parallel with that of the Government schools. They are more numerous than the latter, and in these clerical Athénées it is stated that a much higher salary is paid to professors than in the State institutions, some of the best teachers in Belgium being found in these clerical schools. No Polytechnic schools exist in the country; the higher technical education being carried on in the four universities. In Holland the communes are responsible for providing adequate school accommodation for primary instruction. The elementary schools are divided into ordinary and superior; there is no compulsory attendance, and one half of the children attending school pay no fees. In 1880 the total cost of primary instruction in Holland was 800,000l. for about four millions of a population. Of this sum only 100,000l. come from fees. The school attendance for the year reached 540,000, of whom 400,000 were in public schools. The number of primary teachers was about 14,000. Holland had in the same year 150 secondary schools containing about 15,000 pupils. The greater number of these schools are superior intermediate schools similar to the German Real Schools. They are non-classical, and prepare for trade, university faculties of medicine and philosophy, as also for the only Dutch Polytechnic school at Delft, and for higher technical academies. The other secondary schools include twenty-four gymnasia, and five progymnasia of a similar kind to those in Germany. In 1883 the total cost of education in Holland was estimated at 1,250,000l., of which 375,000l. was provided by the Central Government. We finish our notice of the primary and secondary schools on the Continent by some brief details in relation to Italy, where primary education is both free and com-

pulsory, though the law of compulsion in respect to some parts of that country appears to be a dead letter. Children on leaving the elementary school may either enter the gymnasium (only found in cities), if they are preparing for a classical education, or into the technical school if they are intended for a commercial or industrial career. There are five classes in the gymnasium; the students of the fifth class may graduate as licentiates, passing into the lyceum, which is a higher school, only found in a few of the chief cities; there are three classes in the lyceum, the highest of which leads to the university. The technical schools corresponding on the industrial side to the gymnasium on the classical side have three classes of one year each. The chief objects of these schools is to prepare for trade, but they are also attended by those who are to continue their studies at the technical institutes, or at the professional schools. In addition there are three higher class technical institutes, corresponding nearly with the Polytechnic Schools of Germany. Besides the State Free Schools in Italy, there are several other schools, the Kindergarten, and a large number of private schools under clerical direction. Such, then, is the primary and secondary system of education prevailing on the Continent, of which the foregoing is a summary. We deemed it necessary to devote space in illustration of first and second class schools in the Continental system of education, and of the kind of instruction imparted in these, as a preliminary of technical education proper. Primary instruction is becoming more and more moulded and shaped in these foreign schools, with a view to the actual wants of the age, keeping in sight the future of the workman. A good deal of practical information of course can be given to pupils in primary schools, including free-hand and geometrical drawing, the use of tools, &c., when it is understood that those youths are intending to follow industrial occupations.

In a second article we will pass under notice a few of the most noticeable of the special trade and technical schools abroad and at home, and particularly those intended to supply the training, at least to some extent, obtainable in the workshop under the old system of regular apprenticeship, which, it is to be regretted, is fast disappearing. For the present we will only remark that it is a satisfaction to us to know that in our many articles on technical education, and the wants of our workmen, particularly those of the building and kindred trades, we anticipated long since much of what is at present realised at home and abroad, including even some of the "Recommendations" with which the Commissioners conclude their second report. Finally, in our next paper, we may make some observations on the scope of technical education, pointing out some difficulties that stand in the way of its efficient application, owing to the changed condition of manufacture, resulting from the spread of machinery and the minute sub-division and organisation of labour that now obtains in many of our national industries.

THE LONDON OF THOUSANDS, AND THE LONDON OF MILLIONS OF INHABITANTS.

THE admirable reproduction of a street of Old London,—noticed in a recent number,—which, by a curious irony of arrangement, immediately adjoins the display of machinery for electric lighting, in the Exhibition now struggling into order at South Kensington, has unusual interest at a moment when such grave questions affecting the future welfare of the metropolis are in the air. It is not our object at the present moment either to raise the artistic question, to describe the details of the treat which,—and it must have been at a very considerable cost,—has been provided for the visitors to the Health Exhibition, or to discuss the theory or the detail of administrative reform. Our aim is rather to avoid all points of controversy,—to shock no school of taste,—but to point out certain features of material

importance which, for good or for evil, must dominate the structural development of the London of the future.

"Unfeigned regret," says a writer whose pen it is not difficult to recognise, "will be experienced that the London of to-day is not like the London of Dick Whittington, of Izaak Walton, of the Duc de Sully, and all the other personages whose habitations are grouped together in such an enchanting manner. In fact, the lesson which every thinking Londoner will carry away in his mind from a visit to South Kensington in the present year of grace will be that the capital city is fifty degrees uglier now-a-days than it was in an epoch which we are generally taught to regard as almost barbarous."

A scale of ugliness has yet to be contrived; and hard and long would be the contest before it was admitted as a canon of art in any branch. Nevertheless, it is impossible to observe the change which has come over the building aspect of the country within the last few years, without admitting that the writer whose words we have cited has expressed opinions that are very generally held. We wish, however, rather to look at the transformation undergone by London in the past, and to see how far we may expect the continuance or the variation of the process in the future of change, than to express any appreciation of its artistic value. It must be remembered that we see the beautiful work of Mr. George Birch fresh with all the lustre of novelty. To the interest attaching to reproduction is added that which is due to good and unspoiled workmanship. The mimic antiquity,—valueless as it may be if regarded from the stand-point of a pedantic antiquarianism,—has in the eyes of nine visitors out of ten no small advantage over the real antiquity, could such be found. And found it can be. It would add to the value of the description given in the "Official Guide to the International Health Exhibition," if dates, as near the mark as possible, were attached to the different houses. Elizabeth's reign is given as the date of No. 14, and the date 1480 is attributed to the Fountain Inn in the Minories. Now, in not a few parts of England, notably in the streets and in the vicinity of Guildford, are to be found houses of equal age. One, a country grange, part of the stonework of which is attributed to the reign of John, bears the date 1485 (if we remember aright) on many of its massive timbers. A fine gabled mansion at Merrow, which sank to the office of a roadside inn in the days of coaching, and is now only a yet more humble public-house, bears openly its date of 1615. We could point to instances in the same neighbourhood where the style of the structure, the character of the wood-carving, and the condition of the houses challenge a very early age. If these are comparatively rare, it is due to the fact that timber is not imperishable. On a sudden a whole front of great age and great beauty may give warning that if it is not taken down,—for reconstruction, let us hope,—it will take itself down; and the main point is, that in any but buildings of which the importance is so great as to mask the spoiling touch of time by the very grandeur of their decay, squalor creeps on with age. Thus our counterfeit but fresh old London has one kind of charm which would have been absent in the real antique; whatever claim that may have on us in its relics, or may have had on the coeval inhabitants of the City.

In the change which has occurred since the Elizabethan and the Stuart times there is much more than that to be regarded than the change of fashion. That the pure incalculable caprice of what we call fashion is one element of architectural change there can be little doubt. In dress this caprice is now, perhaps, the most potent of all causes of change. But even in dress the progress of science and of art has had no small influence. The whole growth and development of defensive armour, from the time of William the Conqueror to that of Henry VIII., has been regulated rather by reason than by fashion. With improvements in offensive weapons, defensive clothing became more and more complete, cumbrous, and com-

plex, until the time when gunpowder gave to the bullet a force which no armour could resist, and plate and scale armour, as well as mail, disappeared almost at once. But during the greater part of four centuries the fashion of dress was, to a considerable degree, determined by the exigencies of the armourer.

That in architecture, as in dress, there have been structural or material reasons for changes of style is universally admitted. Pure caprice may, no doubt, have had its influence,—an influence which is not, perhaps, indistinguishable in the building of the present day. But apart from these two causes, and, we apprehend, far more effective than either, is that mighty solvent before which old laws, old habits, old customs, old tastes, everything that is old, at least, in Western Europe, has yielded, namely, increase of population. In 1560 London did not reach beyond Charing Cross to the west; Holborn ran along its northern fringe; its eastern boundary was about half a mile from the Mansion House, and narrow strips of building lined the river as far as Westminster and Wapping. The borough had an extreme width of a third of a mile, and an extreme length of a mile and a quarter. Roughly measured, the area could not have been much more than double that of the city proper, or from 1,200 to 1,400 acres. If we allow the same density of population over this area as that which now exists in the "Central London" of the Registrar General, the London of 1560 held some 105,000 to 123,000 inhabitants. The "Greater London" of the census of 1881 covered 697 square miles, and held, in that year, 4,764,812 inhabitants. In the City alone the population had fallen from 74,688 in 1871, to 50,276 in 1881, figures which, comparing area with area, accord very closely with our above estimate for 1560.

So mighty a change as the multiplication of a body of citizens by forty fold must have had an influence on habit and on abode of an irresistible force. It must have told, silently and imperceptibly, on every element of structural design. Look at such a question as that of the proper width of streets and area of public places. All the inhabitants of so vast a province do not, of course, seek daily the same centres of occupation. Possibly there are few persons now to be found who have ever passed through London, from east to west, or from north to south, in a single day, except it were by railway. But what would be the difference required in the width of such a line of street as that running along the Strand, Ludgate-hill, and Cheapside, when it was the main thoroughfare for a city of one, two, or three hundred thousand inhabitants, and when it becomes one of the parallel routes for the traffic of a city of four millions and more?

This question of the capacity of thoroughfares for traffic is one that is intimately connected with such structural changes as distinguish the Old London Street at South Kensington from, let us say, the Westbourne-grove of to-day. Each house reproduced in the former had its individuality. The house was the architectural unit of the city. It is no longer. It is the street that is the unit. In Old London each trader not only sought to give importance, character, attractiveness, to his house or shop, but provided,—as is to be well seen in the restoration,—for the comfort of the pedestrians. Under the jutting verandahs or shed roofs that protected the open shop-fronts, shelter from a passing shower was at any time attainable. And no doubt, for this cause, a rainy day may have been very good for trade.

At present it is not the question whether we admire the old shelters, as architectural features, or not. Their re-introduction, with all their picturesque convenience, would be simply impracticable; and that for the sufficient reason that a check would thus be imposed on the circulation through the streets, which would make them absolutely impassable. Neither fashion, nor taste, nor the improved command of building materials which enables us to give such convenient shelter to our railway platforms, can outweigh this question of capacity for traffic. If all London were to agree to shelter its footways the case might be different.

But a partial shelter, thus effected, would cause such an absolute block, in heavy showers, as to be totally out of the question.

This is but one example of the influence which the increase in magnitude of a city must have on its architecture. Many more might, no doubt, be found. Not to weary our readers with the research, let us recall one effect of the Fire of 1666. At that date, as far as we can ascertain, the domestic architecture of London was for the most part essentially wooden in its motive as well as in its material. Overhanging stories gave picturesque lines of shadow. They may have gradually become more an *amore* architecturally characteristic from the time when the war-ships of the sea kings were drawn up on the beach, and converted into homes for the sturdy settlers. At all events, the employment of massive timbers was an essential element of stability in this mode of building. With the terrible lesson of the Great Fire, it is more than probable the use of wood in urban building became more questionable; the cost of whole beams of oak also became comparatively higher. Thus brick came to supersede framed houses; and one of the pictorial elements of ancient London, swept away by the fire, has never been, in the main, reproduced. Nor should it be omitted to note that in the recent return to the ancient pictorial style,—without the structural safeguard of massive timbers,—we have in not a few cases seen menace of future danger. A heavy front resting only on projecting joists, however numerous, would come down in hopeless ruin if dry rot attacked the thin and narrow timbers.

Another element of degradation in the architectural character of a great city arises from the ever-increasing demand for cheap abodes. We can, to a certain extent, measure this demand, and in so doing we obtain a remarkable proof of its force, although we are far from asserting its limit. Over the "Inner London" of the Registrar-General (as may be gathered from the twelfth report of the Local Government Board, if the information thence abstracted be compared with the details given in the census), between six and seven houses stand on each average acre of ground, and the rateable value per house is 56*6**l*. That is the general outcome of the metropolis, and the average accommodation given is equal to 7*4* souls per house, giving a mean density of population of 50*6* souls per acre.

But if we take the City of London proper, the heart and nucleus of this province, what do we find? Every acre contains ten houses, and houses of such palatial size as to be rated at an average of 640*l*. per annum each. Notwithstanding this, the census population is only at the rate of between seven and eight persons per house, or seventy-eight persons per acre; (of course, the day population is much more). Contrast this with Shoreditch. There, between twenty-three and twenty-four houses stand on each acre of ground; or, deducting one-fifth of the area for roadways, a house on every 166 square yards of land. Each house is rated at 31*5**l*. per annum; yet in each of these small houses are packed more inhabitants than in those which, over the average of "Inner London," have nearly twice the rateable value. There are 8*3* persons to every house in Shoreditch, or 195 per acre. It would be hard to show more pitifully what extremes of wealth and of poverty have to be accommodated, as best he can effect, by the architect in London.

Taken per inhabitant, the range of rateable value of house-room is from 68*8**l*. in the City of London to 4*6**l*. in Shoreditch. In Woolwich Union the rateable value is as low as 3*5**l*. per head accommodated. But here there are less than two houses per acre, so that the density of 6*8* persons per house bears no comparison, from a sanitary point of view, with that of the 8*3* per house in Shoreditch. There, as we before showed, the terrible density of 195 persons per acre is the average over a square mile of ground. In the Woolwich Union as yet this creeping malady of density has only attained the measure of little more than 12 persons per acre. The proportion between the indicated deficiency of accommodation, and increased payment for rent, in the

more populous union is as striking as it is melancholy.

It is, however, matter for very attentive regard how completely the great province, now growing and developing at the rate of $\frac{2}{3}$ per cent., or thereabouts, per annum, has organised a provision for its main needs. The five millions and upwards of inhabitants of the "Greater London" of the Registrar-General will require, at the modest allowance of 2 lb. per head, at least 4,500 tons of food per day. Of ale, wine, spirits, tea, coffee, or whatever may be the beverage in each case, we cannot reckon the demand at less than 800,000 gallons per day. In point of fact, to quench that potent thirst, to afford the water for cooking, washing, baking, for the use of manufactures, for the extinction of fires (at least five of which may be daily expected), for the watering of roads and of gardens, and, more exigent than all, for the daily subterranean removal of from 6,000 to 7,000 tons of the effete products of vital combustion, more than 140 million gallons of water are daily supplied, collected from sources at twenty, thirty, forty miles distant from the points of supply. Thirty gallons per head of the population per day are thus distributed at a far lower cost than would be involved by the simple process of dipping buckets in the nearest stream or well in the London of 1560. The lowest cost at which, it was estimated in 1850, a house of the value of 10l. per annum could be supplied with water by ordinary household service, was two-pence three-farthings per week, or, within a penny, twelve shillings a year. To a house of that rental in London upwards of 200 gallons per day is supplied, available by the turning of a tap, at the cost of eight shillings per year. In Paris, at the present time, great part of the population is supplied by water-carriers at the price of five centimes per pail, or about six gallons for a penny. The supply which is afforded to the humblest resident in London, taking the average per day, if paid for at that rate, would cost 7l. 12s. per annum! Three-fifths of the Paris charge goes to pay the labour of the water-carrier, who has to pay 2 centimes per pail for the water that he draws from a stand-pipe. The lowest possible subscription for direct water supply from the Company in Paris is 2l. 8s. per annum, or six times the minimum in London.

The rateable value of London, in 1855, is given by Sir J. W. Bazalgette at 10½ millions sterling. Its increase since that date, taking Inner London alone, has been at the rate of 625,000l. per annum, the corresponding increase of population being at the rate of 70,000 per annum. But in all remarks of the kind we must guard against the idea that "London" is anything but a topographical expression, except to those who have some conception of the character of the distinct provinces which make up the imperial whole. For that whole comprises a fifth of the population of England. Its inhabitants exceed the aggregate of those of Paris, Berlin, Vienna, Rome, Dresden, and Turin. The English spoken in its eastern differs from that of some of its western districts as widely as does the English of the time of Queen Victoria from that of the time of Queen Elizabeth. There is a wider difference between the rental of the citizen of the chartered mother city, and that of the dweller in populous outskirts, than there is between Pekin and Berlin. Five great railway companies compete to carry coals to the metropolis at,—it has been stated before Parliament,—a heavy loss to the proprietors. Six hundred thousand cubic yards of scrapings are annually removed from the streets. A snow storm, it is true, gets the better of London. But so it does, if heavy, of our country roads and even of our railways. Perhaps a hot-water system may be hereafter organised for the removal of snow and slush. Some 400,000 pedestrians, together with 75,000 vehicles, pass daily over the Bridges of London. About an equal number arrive and depart by the three metropolitan railways alone. Considered as a whole, the daily life of this great province, and its comparatively easy working, present a spectacle which in its way is almost unparalleled in the world.

RUSSIAN ARCHÆOLOGICAL PROGRESS.

ARCHÆOLOGICAL news comes always somewhat slowly from St. Petersburg, and this year the issue of the annual "Compte-Rendu" is unusually late. When it does appear, however, the imperial magnificence of its illustrations atones for the long delay. From the preliminary "Rapport" we learn that not only have the excavations at Kertsch been steadily continued, but comparatively new ground has been broken on the peninsula of Tamana and in the immediate neighbourhood of Anapa on the eastern shore of the Black Sea. We say comparatively, because in 1876 the three artificial mounds known as the "Three Sisters" had been previously opened and in part investigated by M. Bayern, working for the Caucasian Society. More thorough excavations have now been undertaken by the Russian Government, and were conducted by Baron Tiesenhausen. They have yielded abundant and important, though not sensational, discoveries, and they are to be continued by M. Verebusoff, the director of the Kertsch Museum.

At least three-fourths of the tombs opened had been already rifled, though not altogether despoiled. This is the bitter disappointment that constantly awaits the excavator. Two tombs, however, not far from the "Three Sisters" mounds were discovered intact. From them were obtained vases, chiefly adorned in relief, a bronze cup and mirror, leather sandals, and a coin of Panticapeum. On the wrists of a woman's skeleton were still remaining bracelets of wooden beads. On her fingers four rings are engraved with a figure of Apollo holding in the left hand a bird, in the right his bow. On the neck of the same skeleton was a gold chain ornamented with lion-heads, and a necklace of beads, mixed gold, wood, and stone; earrings were also found with designs representing Eros, and on the skull there lay a circular gold plaque with a head of Hermes in *repoussé* work. This tomb may serve as a sample of similar "finds," full particulars of which are given in the Rapport.

The Rapport is followed, according to custom, by a Supplement, which is, perhaps, the most important part of the whole issue. It consists of the publication, in magnificent plates, of the principal objects found in the Kertsch and other excavations, or that have been otherwise acquired for the Hermitage Museum, with a commentary by the Director, L. Stephani. The commentary we may dismiss. It has its own peculiar reputation among archaeologists, which reputation the present number maintains, but the plates should appeal to more than a specialist public, and, unhappily, from their great cost, they become little known.

Plate I. gives a very remarkable series of silver bowls, gilt by a process of which, so far as is known at present, these are unique instances. The engraved designs are precisely in the style of the early red-figured Attic clyx-painters; in fact, from the plates the most expert eye would take them to be fine specimens of the fifth century B.C. ceramography, not silver engraving. As it is, three out of the four have the air of translations from vase technique into metal-work. One represents a charming Victory (Nike) seated, and with a phiale in her hand; the second, Bellerophon and the Chimæra; the third, Menads and Satyrs; the fourth, of later and altogether different style, apparently represents a scene from family life. With them are published a delicate stag's head in gold, a small bronze Anaduomene, and two exquisite gold earrings. The silver cups were found in the "Seven Brothers" tombs, but their exquisite designs only appeared later after careful cleaning.

Abundant though bronze Etruscan mirrors are, a mirror with pure Greek engraving is still a rarity. The second plate of the "Compte Rendu" gives us not indeed a mirror but a mirror case engraved with a design of extraordinary beauty. The drawing shows perfect mastery of the human figure, and yet the treatment of the drapery is fringed with archaism about the folds, which leads us to place the work late in the fifth century B.C. It represents a youth leaning on a club and

standing in front of a seated woman figure. This mirror case was found in the neighbourhood of Kertsch. With it appeared two lovely gold necklaces of unusual patterns, and forming an odd contrast in style; a silver cup, Persian work of the time of the Cassanides. The cup is remarkable as an instance of a Greek thought uttered, so to speak, in Persian phraseology. The Greek love-god Eros appears in the centre of the cup, seated cross-legged on a quaint hoisted Persian lion and playing a thoroughly Persian and wholly un-Hellenic guitar. The cup was found near Irbib.

In the apartment of terra-cottas we have a very well preserved lekane, the design in which is interesting as representing a toilette scene in the gunaikonitis of a Greek house. The drawing is rough and sketchy. Also a terra-cotta fragment, valuable because it represents a scene of worship in the presence of a very archaic xoanon, several terra-cotta masks finely worked, a figure of Eros winged and standing in the conventional Praxitelean pose, a muse playing the lyre, and others of less importance. With these terra-cottas we may note a very fine female statue restored as a torch-bearer, and a head of Aphrodite.

The gems which occupy the fifth plate merit a separate notice, not only for their intrinsic beauty, but for the manner of their reproduction. Each important gem is copied twice; once from the original to give the effects of colour, once from a cast, which throws up minute detail to much better advantage. Conspicuous among the rest are two sardonxy cameos,—a magnificent head of Zeus and a Medusa head executed in exactly similar style. The types of both are post-Pheidian. A second sardonxy cameo is inferior in workmanship, but represents an interesting and not very usual subject,—the acquittal of Orestes. Athene is dropping her vote into the urn, and the sacred character of the place is marked by the archaic figure of the Palladium. We need only enumerate other cameos,—a Dionysus, a Perseus and Andromeda, an Orpheus, a Ganymede. A small chalcedony claims attention from its unusual type. Zeus, seated, holds on his outstretched right hand three diminutive female figures. We are left to choose between the Hours, the Graces, and the Fates. This habit of holding subordinate deities on the hand is familiar enough to literary tradition, but extant artistic evidence is rare. The very early artists, Tektaios and Angelion, when they made an image of Apollo for the temple at Delos, placed on his left hand the figures of the three Graces,—one playing the lyre, another the flute, and another the syrinx. The attributes of the figures in our gem cannot be made out. We have only space further to enumerate a glass paste of Apollo in the "Apollino" attitude, with his Delphic accompaniments of tripod, raven, griffin, serpent; a sard with the Emperor Pertinax and his family; a Byzantine sardonxy (Valerian I. or II.); and two Persian cylinders.

NOTES.

THERE is some talk among the non-successful competitors in the first competition for the new War Offices, of the advisability of endeavouring to arrange among themselves for an exhibition of all the designs which were sent in, including the eight which must still be unsuccessful (presumably the selected design will not be available for exhibition), so that everyone who has given labour and thought to the subject may at least have such a return for it in public appreciation as might be afforded by an exhibition of their work. In our opinion it would have been more desirable, and certainly more generous to the architects, if the Government had itself initiated a public exhibition, and allowed the competitors at least the credit of their work; but riding rough-shod over architects is such a favourite amusement with private individuals at the present day, that perhaps it is hardly to be expected that a Government Department should not take its turn at the sport. As it is, the matter seems to rest now entirely in the hands of the competitors themselves. We have had some in-

formal communication on the subject from one of them, representing the views of several others, and we have been asked to make public the fact that certain of the original competitors wish for such an exhibition, and would be glad to know the views of others. We shall be happy to assist the arrangement by publishing the names of those who are desirous to co-operate in it.

The subject of the competition came up in the House of Commons on the evening of the 5th ult., in Committee on Supply, when a question was asked as to the advisability of including a residence for the First Lord of the Admiralty in the new buildings. Mr. Shaw-Lefevre said it was an open question whether a residence in the main building or contiguous to it was a necessity either in the case of the First Lord, or the First Naval Lord, or the Commander-in-Chief, or the Secretary for War. The same arguments applied to all four cases. But the residences for the First Lord and the Naval Lord could be provided immediately contiguous to the main building if found necessary. In reply to a question from Mr. Rylands as to whether some architects had not sent in more than one design, and what was the real number of competitors, the answer (as reported in the *Times*) was that "the number of contributors was 128, and each had sent several contributions towards one design." The wording of this would convey the impression that all the competitors had sent in several designs. The meaning must have been that each one had sent in several drawings of one design, viz., plans, sections, and elevations, as usual in such cases; but the expression "several contributions to one design" would certainly convey a different impression to most readers.

It is understood that the authorities of the National Gallery have recommended the purchase of eight pictures out of the Marlborough Collection. These are the "Madonna Ansidei" of Raffaele, an exceptionally fine example of the painter's earlier style; three paintings by Rubens, the "Venus and Adonis," the "Graces," and "Andromeda," and the "Distribution of the Rosary," by the same painter, a small study. The remaining three on the list are a portrait of the Duke of Hamilton by Mytens, a female head by Sebastian del Piombo, and a Spanish seaport, attributed to Weenix. These three latter are presumably selected as filling up historical gaps in the national collection. The disposition to add materially to the present collection of works by Rubens will no doubt be criticised by some who do not sympathise with his exceedingly robust style of subject and execution; but as we are half way to an exceptionally good representation of him at the National Gallery, it is certainly a point of wisdom to supplement it in order to make a special feature in our Gallery. It is worth while to be the chief representatives of Rubens in European galleries, for the sake of the man as well as of his works.

At the same time, we fear that the feeling that there is honour and credit, and even indirect material gain, to ourselves as a nation, in the possession of great works of art, is getting more and more weakened. Sir W. H. Gregory addressed an eloquent and certainly not uncalled for protest to the *Times* of Thursday last in regard to the melancholy fact that our great private collections are coming one after another to the hammer, and no one cares. It is, as he truly says, "a widespread public concern. Besides the shame of the richest nation in Europe allowing its noblest works to fall into foreign hands, to do so would be almost tantamount to the final suppression of so many public collections. Show-galleries like the Blenheim and Leigh Court collections, liberally exhibited to all comers as they have ever been, were heretofore almost as much the property of the nation as of the actual owners, so far as access is concerned. In Italy the Government actually claims the right of pre-emption of works of art sold within her territory, and exercises that

right constantly and without reluctance." But we are fallen on days when what may be called the spiritual value of an acquisition is of no account; when material value only is reckoned. Over and over again of late years has the English Government been solicited to purchase for the National Gallery or the British Museum treasures which it should be the pride of any cultured nation to possess, only to reply with a cold *non possumus*. "Peace, retrenchment, and reform," if you like, but no Art; for we have become a practical people and cannot see the value of it. Do those who reason thus ever think that works of art are the expression of the joy of life; that indifference to their production or possession is an indication of the decay of the spiritual or intellectual life of a people, of their capability of joy? Apparently not. It is of no consequence: buildings may be ugly as long as they are economical and well drained; things of beauty which it was the glory of former Englishmen to have collected, may go and be the pride and glory of other nations, rather than that we should put our hands into our well-filled pockets. To our thinking, the spectacle is more than pitiful, it is ominous; and as we see one collection of archaeological and artistic treasures after another allowed to slip out of our hands, works of great minds whose equals may not be found again, we think of the legend in Josephus of the voices that were heard in the Temple, before the fall of Jerusalem, saying "Let us depart hence."

The last number of the "Mittheilungen des Deutschen Archäologischen Institutes in Athen" contains a paper by R. Koldewey which should be of great interest to students of ancient architecture. A full account is given of the great Græco-Roman bath of Alexandria-Troas (the modern Eski Stambul). The ruins are sketched in the "Ionian Antiquities" of the Dilettanti Society, but by this society as well as by Texier, in his "Description de l'Asie Mineure," the ruins were described as belonging to an ancient gymnasium, and this erroneous supposition led to erroneous descriptions and restorations. These have been now corrected, and a detailed and accurate report is given, accompanied by lists of measurements, sections, and a full architectural plan. The method of conducting and distributing the water in the bath is fully discussed and explained. From certain architectural analogies Dr. Koldewey thinks that the bath of Alexandria-Troas is of much the same date as the well-known Exedra of Herodes Atticus at Olympia (i.e., about the middle of the first century A.D.). It thus forms an interesting link between the simple, early bath-structures of Assos and the luxurious complicated structures of late Roman times.

ADVICES from Panama of the 5th of May are to the effect that the dry season has not been healthy. Marsh fevers have prevailed, the majority of the victims being between eighteen and twenty-five years of age. Twenty-three sections have been organised, including which the preliminary works are said to be nearly completed; and the actual excavation has extracted up to March last, between five and six millions of cubic yards. It is expected that this quantity will be trebled next year, as more dredging and excavating machines will by that time have been delivered. The sum expended up to the present time is stated at between six and seven millions sterling. This is in accordance with the fact that half of the "constituted capital" of 12,000,000*l.* has been called up, and a loan of 1,000,000*l.* raised. The actual work done is, therefore, only about 5 per cent. of the excavation for the line of canal, which was estimated by a Commission of the Academy of Sciences at 100,000,000 cubic yards. Nor is any thing said as to the commencement of the great dam near Matachin, which is to contain 26,000,000 cubic yards. How the difference between the "constituted capital" of 12,000,000*l.*, and M. Voisin's estimate of 42,800,000*l.* is to be made up, is also left for the future to disclose.

SUGGESTIONS have been made in some quarters as to the advantage of following the primitive rather than the Mediaeval type in the construction of Liverpool Cathedral. Modern architects have hitherto thought themselves bound to reproduce, in varying combinations, examples of the Gothic idea, and the Basilica has been almost neglected; yet there is much to be urged on practical grounds in favour of the latter, which is, in fact, the earlier form, and was not unrepresented in pre-Norman England. It is not easy to understand the plans upon which the old English builders constructed their more important churches (for contemporary annalists indulged in language of poetical exaggeration), but the general features both of Wilfrid's Cathedral at Hexham and of Augustine's Church at Canterbury certainly resembled those of a Roman Basilica. Professor Willis has, in his "Architectural History of Canterbury," given a ground-plan of the original cathedral from Edmer's description, and it undoubtedly recalls the basilica of St. Peter at Rome. There would not, therefore, be anything out of the way in the idea that has been suggested. Perhaps a still better idea would be the adoption of a Greek Cross plan, with an open central area, like that which Wren wished to carry out at St. Paul's, as the best model of a Protestant plan. It would, too, be in thorough harmony with its surroundings at Liverpool.

At the sitting of the Thames River Preservation Committee on the 9th, it was suggested by one witness, who was a riparian owner, and had been much troubled by invasion of pleasure-parties on his grounds, that public camping grounds should be provided at various places, where people should have a right to land. This really seems to us one of the most practical suggestions which has been made for meeting the rights and pleasures of all parties. Mr. Vansittart, who made the suggestion, seems to have acted with great forbearance in not interfering with a number of people who interfered very much with him, breaking his trees and making his grounds "hideous with litter of all kinds," and his business-like suggestion has, therefore, the more claim to attention.

THE Health Exhibition Conferences held by the Mansion House Council on the dwellings of the poor do not seem to have brought out anything very new as to the means of meeting the various difficulties connected with the subject. Mr. James Hole renewed the subject of the lateral extension of workmen's dwellings by railway connexion, against which, as a solution of the problem, the weight of evidence has already been recorded, as we have remarked previously. The Vicar of Spitalfields demanded powers of legal interference and redress, most of which actually practically exist; another East-end vicar, the Rev. Septimus Buss, of Shoreditch, stated roundly, that in his opinion the law, as now existing, has full power to deal efficiently with sanitary matters; thus supporting what we have said all along since the agitation commenced, that the thorough application of the existing sanitary law should be the first step. The one new point in legislation which seems wanting is the power to inspect houses let out in tenements as well as "common lodging-houses." The Rev. George Murphy, of the London School Board, suggested that it would be a good thing to call a meeting of *bonâ fide* working men and have their views on the subject. Something might be struck out in this way, perhaps; it is noticeable that the one working man who spoke at the meeting, Mr. Hunter, was clearly against the system of paternal government and building cheap dwellings at fancy rents for the poor; the working-classes desired, he said, the help and sympathy of the well-to-do, but they "would not be treated as mere machines." At a subsequent conference Mr. Ernest Turner read a practical paper on the arrangement of metropolitan houses, commenting on the want of attention to special construction for special classes of tenants; a report of this paper will be found elsewhere, and is worth attention.

We publish elsewhere two letters, or portions of letters, embodying what we are to understand is the Liverpool view of the Manchester Canal question,—one by Sir W. B. Forwood, quoted from a Liverpool paper; one addressed to ourselves by the manager of a large shipping firm, and written partly in relation to some recent remarks in our columns on the subject, suggesting that Liverpool and Manchester should join hands in improving the Mersey estuary. Both writers understand, at all events, the commercial side of the question, and it will be seen that their position is that the work as proposed will in the end be injurious both to Liverpool and Manchester, in hastening the silting up of the mouth of the Mersey. The statement that there is 4 ft. less water over the bar now than there was seventeen years ago is, no doubt, a serious one. That, however, seems all the more reason for Manchester and Liverpool to join hands, as we suggested, in doing the best for the good of the estuary, in a matter which must concern both their interests, whether the canal be made or not. By the way, Sir W. Forwood falls into rather a confusion of language in talking of "the bar" as if it were the channel, and of the necessity of "maintaining" it. "The bar" is, as its name implies, the obstruction caused by silting up. What is to be maintained is not the bar, but the passage through or over it.

QUAINT CORNERS OF CAMBRIDGE.*

II.

"AN Athenæ Cantabrigienses, in its plan, correct; in its views, extended; in its literature, critical; in its principles and execution, generous," says Dyer in his "History of Cambridge," "might furnish half a score of students full employment for twenty years together." And a description of all the beauties of Cambridge would, if we substituted columns for years, require just as much energy; but the devoted antiquary alone could be found to write the one, while the most industrious reader of newspaper articles would scarcely be foolhardy enough to read the other. Debarred, then, of the selfish gratification of having in plain black type on paper all the sights that a short while ago were in living colours before us, it is only possible to recall some of those pictures whose characteristics were most powerfully marked. The picture of a town scene is loveliest when it combines the antique relics of past human skill with the bustle and life of the present; let us, then, review some of the best of the "quaint corners" of the various colleges in Cambridge, contrasting, as we do so, their time-honoured antiquity with the many-coloured web of existence which surrounds them.

Some of the most delicate art and picturesqueness in Cambridge is to be seen on the old gates of many of the colleges. Thus we have the handsome portals of Trinity, of St. John's, of King's; but these are too well known to need description, so let us pass to a little corner where there is a gate, not so well known, but which in its ruined state is far more pleasing than the others in their entirety. The point is one just outside the entrance of Clare College, with Trinity Hall on our left and the stately magnificence of King's Chapel on our right; the portal of Clare is behind us, and, if we turn, we look under it on to a snug college court and lawn, and through another portal down the beautiful avenue of the Clare grounds: before us are the various unfinished buildings of the university library and the geological museum, the entrance to which is the "old gate of kings,"—a splendid bit of workmanship, but never completed, because that portion of King's College to which it was to have been the portico was sold to the University, and the new buildings were erected on the other side of the chapel. It is a grey ruin now, and the idealist might clothe it in a sufficient air of romance to liken it to an uncompleted or an unrealised dream. A shade of sadness hangs over it; the skilful hand of the architect has been at work once and has laid stone on stone, and carefully fashioned delicate carving and tracing among its lines and mouldings, but just when the work had reached a stage at which it could show how beautiful it was going to be, it was destined to be touched no more, except by the softer touch of time, which has toned down its hard lines,

changed its monotony of bright stone into a varied and rugged grey, trailed ivy up its unfinished columns, and planted stray flowers and weeds among its bricks. In the centre of such a quiet corner, it stands out to great advantage, although it seldom catches the sun upon its niches because of the tall buildings which surround it; unheeded by most who pass beside it, and particularly by the busy men of Clare, who see it oftenest, it just eludes the bustle and noise of the little thoroughfare a few paces farther down which runs into the King's Parade,—Senate House—passage. And here, again, we have a "quaint corner,"—a long narrow lane of university buildings. On our right, a portion of the library, and farther down the Senate House, where the examinations are held, or as the local rhymist called it,—

"That grisly hall . . .
Where all who live by victual go."

On our left the different parts of Gonville and Caius College, the new part with its pointed turrets and pinnacles in the distance, and the old part with its ivied walls and delightful gates near at hand. Passing up and down is a constant stream of traffic, in which are conspicuous the "short-gowned" youths of the Hall; in the morning they may be seen at the strike of the clock rushing to their lectures; in the afternoon, when the less serious occupations of the day are done, walking demurely to their wonted exercise, and wearing upon them the black and white "blazer," the emblem of boating superiority.

Humility, virtue, and honour, such are the names of the three old gates of Gonville and Caius College, and not alone does the moral quaintness of their nomenclature raise a moral, but their picturesque pretentiousness attracts a look of admiration, which architecturally we ought not to grant them. The gate of Honour is the prettiest of the three, and may be taken as typical of the *minimi-pinini* conceptions of the two others elaborated. It is built in that affected style of ultra-ornamentation which was imported from Italy in Elizabeth's reign, and went hand in hand with euphuism and the smaller charms of the Renaissance, which formed the "aestheticism" of that age. Yet, notwithstanding the false taste, the little old gate with its crown of ivy, its niches and mouldings of parti-coloured grey stone, and its half-corroded ironwork is worth being pleased about. It has a history as well as any of its statelier and more correct neighbours, and is to be despised because it points to a less noble development of the taste of those who reared it?

The art of Cambridge is particularly happy in gates. Another quaint bit is the old gate that leads to the Bishop's Hostel, in one of the most secluded parts of Trinity College. Embellished with coats of arms and odd devices wrought in stone; it stands alongside of one of the earliest portions of the college, and the gloom of its surroundings is but seldom enlivened, except on Saturdays, when a crowd of Trinity washer-women with their big baskets and bundles of clothes, not alone give colour, but also verbal liveliness to the neighbourhood. Then, between Trinity and John's in Trinity-street stands another old gateway, with nothing particular to recommend it, except that, being entirely out of place where it is, it naturally looks very pretty, and with the loops and wreaths of ivy hanging over its square-cut blocks of stone, and with the long row of the buttresses of Trinity Chapel behind it, it forms an odd little corner in the busiest street of Cambridge.

Close alongside of this bit is another little peep, this time into St. John's College. Standing with our backs to the Divinity Schools, we look into the first court, with the chapel on the left, and the hall, built of deep red bricks, in the background, while all along in front is a double facing of ironwork, beautifully designed. This portion of Trinity-street and St. John's College is seen to most advantage just before dusk, when the last red tones of the after-glow shed their expiring warmth of light on the statues and marble columns of the chapel, while in the distance the lamps are just being lighted in the hall, and shine through a lofty row of painted windows.

And so on, we might get a view of every one of the colleges from some point whence they are not usually seen, and find corner upon corner to delight us, which we had formerly left unheeded. Thus we might draw enjoyment from the interior of Clare-court, particularly

when in the autumn time the creeper, that grows round the windows of the hall, sheds its scarlet leaves; or we might take a look at Jesus College from Midsommer Common, and mark the various gaps between the trees of the close, through which we could gaze at the old college, with its homely red bricks, half covered with ivy, and surrounded by flowers and fields, looking, for all the world, like a pleasant country manse with a little village church beside it; or we might see the loveliest view of King's Chapel by looking at it from the Fellows' Gardens, where the trees fashion around its crowned spires a perfect frame of leaves and branches; or again, we might imagine ourselves back in the fourteenth century when we visit the aged bits of Corpus, in those days Benet's, College, and recall the times of the great "town and gown" contests, when not only noisy undergraduates and idle shop-boys, took part in the "rows," but mayor and aldermen and burgesses on the one side came out audgelling with provost, dons and fellows on the other; and, what is more, provost, dons, and fellows got the worst of it, while, as the historian pitifully remarks, "they,"—i.e. the mayor, aldermen, and burgesses,—"went into the market-place, where with clubs they brake the seals of the University charters, and then burned them in the place. One Margaret Stier, a mad old woman, threw the ashes into the air, with these words,—"Thus, thus let the learning of all scholars be confounded!"

"Quaint corners," there are, enough and to spare, whether we see them in the red chimneys of Magdalen or in the dark corners of Peterhouse; among the chequered shadows cast by the ironwork of the Bridge of Sighs at John's, or among the varied fragments and buildings of Pembroke, or even from among the classrooms at the side of Trinity Gate, where no one



ever seems to go. But perhaps there is no college that has in it so many quaint bits as Queen's, situated exactly on the river. The back portion of it is joined to the other side by an old wooden bridge, called Sir Isaac Newton's Bridge. One day, so runs the story, the sage thought he would build a bridge that should puzzle everybody. Whether he was an undergraduate at the time the story does not say. It would be a strange thing nowadays to see an embryo Newton squatting on the banks of the Cam and ruminating on the construction of a bridge across the river. However, that is not the point, so be set to work, and constructed a diabolical piece of mechanism, which was so adapted as to fit together without the use of a single nail, and which was such that every beam bore an equal weight, and which was also such,—and this the sage, probably from a morbid desire for mischief, did not state,—that if once taken to pieces it could never be put together again. Many years elapsed, and long after the sage had become petrified and posted on a fine marble pedestal, to listen without finching or yawning to the daily services of Trinity Chapel, the dons of Queen's thought that, somehow, their bridge required repairing. Many skilful artisans were thereupon employed, and the bridge was soon taken to pieces. At this juncture of the story comes a statement which, in all probability, is mythical; that the eye of the statue in Trinity Chapel was seen to wink. However, that may be, the many skilful artisans continued their work; they cleaned, and polished,

* See p. 817, ante.

and repaired, until they came to the last stage, the refitting, when it was found that,—

"All the queen's scholars and all the queen's men Couldn't put Humpty-Dumpty together again."

The fellows and dons were consulted, but not even the offer of an additional scholarship of 30*l.* a year brought forth the required mechanic, while the ghost of Newton was invoked in vain. Ignominiously baffled, the authorities of the college made a deep-laid plot, by which the bridge was nailed together, and the nails covered with tin and painted over to look like wood; and thus may they be detected to this very day by all who are let into the secret of the story. From the end of this famous bridge and the garden to which it leads, called the Grove, we realise how very charming the back of Queen's is. Looming over the river, the old walls with their brown bricks, their half-pointed windows, and their many chimneys, cast a deep shadow into the



BACK OF QUEEN'S COLLEGE

Cam below; while in some portions they are overgrown with ivy, which hangs in long tangles down to the water's brim, and wall-flowers, which make a charming effect with their bronze and golden colouring. Passing over the bridge and into the college we enter a court or rather a cloister, the quaintest of the quaint, built of red bricks and projecting stories of yellow plaster; it forms an irregular square around a neat green lawn. The arches are low and plain, and, as we pass along and look from underneath them, we see all the various little charms with which the old place is rich; here a strange wooden tower, there a huge sun-dial; here a row of steps, and there a flash of sunlight thrown in from a neighbouring triangular court. It needs but a few sandalled monks to pace along its corridors when the vesper-bells toll, and the true being of the College is complete. The bright-coated, stiff-collared undergraduate of to-day is utterly out of place in the solitary cloister of old Queen's. No place harmonises better with the idea of learning than this fragment of Mediaevalism, with its crooked windows and snug little rooms. They knew how to make themselves comfortable, those old monks, and so did the good-humoured and venerable author of "The Praise of Folly," although, as he pathetically pleads in his letters, he found the college ale so very unpalatable. Up in one of the towers Erasmus had his room, high up, in order that he might have good exercise in mounting the stairs, and, as the historian gravely remarks, "perchance, on purpose to exercise his body and prevent corpulence," but more probably because he loved to look out of his study window on to the pleasant little bits of the old University town; and, no doubt, he chose to reside at Queen's because, with all his grand dreams of advance in learning, and notwithstanding all his scholarship and the Greek books that his friends sent him, together with the occasional and most acceptable present of a flagon of wine to make up for the sour beer, he too loved the "quaint corners of Cambridge."

The Botanical Gardens at Schonbrunn. This favourite resort of the Vienna Population has lately received an interesting addition in the shape of a large palm-house, which is favourably spoken of in the local press.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

PRESENTATION OF THE ROYAL GOLD MEDAL.

The last ordinary meeting of this Institute for the present session was held on Monday evening last, Mr. Ewan Christian, president, in the chair.

The Secretary (Mr. W. H. White) announced that the Conference at the Health Exhibition, under the auspices of the Institute, had been postponed to the 10th, 11th, and 12th proximo.

The following gentlemen were balloted for, and declared to be duly elected, viz.:

As Fellows.—Messrs. A. E. Johnson, Melbourne, Australia; P. M. Dudgeon, Natal, S. Africa; T. Rowe, Sidney, N.S.W.; T. S. Archer (Associate), Gresham-buildings; T. L. Watson, Glasgow; and F. Wheeler (Associate), Cheap-side.

As Associates.—Messrs. A. B. Wilson,* Brisbane, Australia; C. Mason, Borough Engineer's Office, Nottingham; J. A. Williamson,* Edinburgh; J. B. Phillips, Epsom; J. A. Saunders, Folkestone; J. M. Kennard, South Lambeth-road; H. J. Price, Nottingham; F. J. Banister, Great James-street, Bedford-row; L. T. Waller, High Wycombe; A. W. Anderson, Warwick-gardens, Kensington; R. J. Beale, Tottenham; A. McGibbon,* Glasgow; R. M. Hamilton, Christchurch, New Zealand; A. Crow, Stratford; T. F. Pennington, Hungerford-road; W. H. Radford, Assoc. M. Inst. C.E., Borough Engineer's Office, Nottingham; and S. H. Seager, Christchurch, New Zealand.

As Honorary Associate.—Mr. C. B. Birch, A.R.A., of The Studio, Chelsea Bridge-road.

The following gentleman was elected by acclamation, viz.:

As Hon. Corr. Member.—M. Alfred Nicolas Normand, Inspecteur-Général des Bâtiments-pénitentiaires de l'Etat, 51, Rue des Martyrs, Paris.

MEDALS AND PRIZES.

The President.—Gentlemen, you are, of course, all aware, that at this, the concluding meeting of the session, it is usual to present the Royal Gold Medal to the person selected for that honour, approved by yourselves and by her Majesty the Queen, in whose name it is given. You are also aware that this year the choice has fallen on Mr. Butterfield; but many of you may possibly not know, and it is therefore right I should explain, that while thankfully accepting the proffered honour, Mr. Butterfield said that it would be so inconsistent with the habits of his whole life to appear in person publicly to receive it, that if that were a necessity he must regretfully decline. Considering that personal appearance had, in other cases, been dispensed with, the Council were of opinion that this difficulty need not bar their decision as to the man. I thought it my duty, however, when, by your kindness I was elected to the chair, to represent to Mr. Butterfield how great would be our pleasure if he would allow us to welcome him here; but having, I confess, very much sympathy with his feeling in this matter, I could not venture to ask for a change in his decision. Personally I fear I must say that I rejoice in his determination, because standing here as your representative, I know how trying it would be to have to say in his presence how much I respect, both as a man and an artist, the subject of your choice. I know no man whose whole career has been more truly honourable or any one whose work as an architect has been more thoroughly consistent with the quiet dignity so characteristic of his life. In the great movement for the revival of Gothic architecture there have been, according to my view, amongst others less pronounced, at least two types of men who have achieved eminence as practising architects. The prominent leaders of the cause, men of great mental and physical power, indomitable energy, and restless love of work, could not fail to attract general and popular attention, but not less important to the success of such a movement have been the quiet, studious hard-workers, men of not less genius than the others, who in parallel lines have done so much to advance the knowledge and sound practice of the art. Of the former type two have accepted the medal, and, to our sorrow, have successively passed away to their rest. Of the latter one has received it and is

still with us, but the roll of Gold Medalists would indeed have been incomplete had it lacked the name of William Butterfield. In him we must all recognise a true master of his craft, one who not only knows well the art he practises, but whose works from first to last, whether small or large, whether in the quiet country village or in the great city, whether in the small school-house or in the grand university college, all bear uniform testimony not only to the skilful design, but to the earnest, loving care which he always bestows on every detail. It has been my good fortune to see many of Mr. Butterfield's buildings, and I can truthfully say that I have never looked upon one of them without that refreshing sense of satisfaction which good work well carried out must always inspire in those who can appreciate it. Gentlemen, I hope I may count upon your sympathy in saying what I often think, that the world at large shows too little gratitude to those who minister to its improvement or its pleasure. Just as I think the poet, the great writer, the musician, the painter, should be thanked for the gratification which each in his vocation affords, so no less should the great architect; yet who ever thinks of giving him his proper mead of praise? Who ever thanked Sir Christopher Wren for his noble works in the City of London; the churches, towers, and spires with which he beautified it, or the magnificent cathedral, with its glorious dome, its crowning glory? We know too well how the great architect's last days were embittered by the persecutions of men in office not worthy to tie the shoe-strings of the master; yet what a poor mean place would London have been but for the workings of his fine and cultivated genius? Many times have I wished that I might have lived in Palace-yard under the shadow of Sir Charles Barry's noble clock-tower; and of many another work I could probably say the same. Truly, I think if any man earns the gratitude of nations, it is the great architect whose works are for all time, an honour to his country; visible to every one who takes the trouble to see, or has the mind to appreciate, the beautiful in art; and for this reason I think we have done well in offering to Mr. Butterfield the greatest honour it is in the power of this Institute to bestow. If it be true, as I hold with the poet it is, that "a thing of beauty is a joy for ever,—its loveliness increases, it will never pass into nothingness," then, I think, we may joyfully thank Mr. Butterfield for the dignified work of his early years; the graceful and beautiful spire, and the vigorous, yet sumptuous, interior of his noble Church of All Saints, Margaret-street; and lest I should weary you by a bare recital of his works, I will pass over many others, each possessed of the power and beautiful form of which he is so great a master. Glancing only at the noble church of St. Alban, Holborn, and the fine church of St. Augustine, South Kensington, I will stop at the great crowning work of his maturer years, the magnificent and richly-finished chapel of Keble College, Oxford. In each and every one of these there is to be seen, though with great variety of composition, the same noble conception of dignified form, the same careful study of every detail for producing general harmony of work; and while fully availing himself of the richness derivable from the subsidiary arts, in choice stained glass, mural painting or mosaics; the same powerful mastery fuses the whole, and subordinates everything to the architect's design. While possessing, as he does, a profound knowledge of the works of the great architects of old, and availing himself of the numberless resources which they so copiously afford, Mr. Butterfield's genius has enabled him to work in a style peculiarly his own; never slavishly copying, but moulding in his own mind whatever he desired to employ in carrying out his work, and though opinions may and will differ on matters of taste, none can certainly deny that his works are those of a refined and cultivated gentleman, and a most able, original, and accomplished architect. Finally, gentlemen, I think I have said enough to show that our medal on this occasion has been worthily bestowed; and I trust I have not wearied you in dilating, possibly too long, on what has been to myself a very genial theme. As Mr. Butterfield is not able to attend this evening he has deputed Mr. Penrose, who is the Gold Medalist of last year, and a worthy predecessor, to receive it for him. Therefore I shall have the great

* Of the Associates whose election is here announced, those whose names are marked with an asterisk passed the Obligatory Examination in Glasgow; the rest passed in London.

pleasure of handing to Mr. Penrose this gold medal, and at the same time I will hand him a copy of the remarks I have made in presenting it.

Mr. Penrose.—Mr. President and gentlemen, under the circumstances that have been mentioned to you, I have no occasion to say much. I consider it a very great honour that Mr. Butterfield has reposed in me in asking me to be the medium of presenting this medal to him. I shall endeavour to convey to him as soon as I can see him the great enthusiasm with which you have received the President's excellent remarks, which happily I have here in my hand, and which will save my memory being taxed in the conveyance of them. Under the circumstances I believe I may conclude with thanking you all, gentlemen, in Mr. Butterfield's name, for the gift you have conferred upon him.

The President then presented The Soane Medallion (with 50l. to be afterwards paid under the usual conditions) to Mr. John Oliver Harris. In doing so he spoke strongly of the necessity for young architects seeing the work of other nations as well as those of their own country. In the same competition, a medal of merit was also awarded to Mr. Herbert O. Cresswell.

The Tithe prize of 30l. was awarded to Mr. Edwin W. Poley, Associate, the President adding that they had been waiting for some years for a successful candidate for this prize. Sir William Tithe was a great lover of Italian architecture, and though he (the President) did not quite sympathise with him on that subject, still the pursuit of the beautiful was always of advantage to the architect. A Medal of Merit and ten guineas were also awarded to Mr. John A. Campbell in the same competition.

The Institute Silver Medal and ten guineas were awarded to Mr. A. W. Anderson for drawings; also the Institute Silver Medal to Mr. A. N. Wilson; a medal of merit to Mr. J. R. Sutton; and certificates of honour to Mr. A. B. Mitchell and Mr. Henry Downs.

The Institute Silver Medal and ten guineas were won by Mr. T. P. Marwick, Associate, for an essay. Mr. Marwick is the first Ashpitel Prizeman in the Obligatory Examination.

Mr. J. T. Wood, F.S.A., next read a paper "On the Temple of Diana at Ephesus," a summary of which, together with a report of the discussion which ensued, will be found on another page.

THE TEMPLE OF DIANA AT EPHEBUS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of this Institute on Monday evening last, Mr. J. T. Wood, F.S.A., read a paper on "The Temple of Diana at Ephesus." He began with a general statement of the difference between Mr. Fergusson's Restoration of the Temple of Diana at Ephesus and his own. So material was the difference between them that he had felt bound to submit to the judgment of the Institute both plans drawn to the same scale, but in no spirit of antagonism. When in 1863 he set himself to unearth this glorious building, which was reckoned one of the Seven Wonders of the World, he had not forgotten to study beforehand the few ancient authorities on the subject, especially Pliny, in whom, considering that the Roman writer never saw it, Mr. Fergusson, strangely enough, so implicitly confided. Clearly we must reject any of the dimensions given by Pliny which were found irreconcilable with the data acquired by excavations. By this rule Pliny's figures for the width of the temple platform were condemned as inexact. The true width was 239 ft. 4½ in. But Pliny's 425 Greek feet for the length was borne out by the excavations. Mr. Wood thus got, he said, ample space for one or more altars, as well as for marshalling such processions as that described in an inscription found in the Great Theatre. Mr. Fergusson suggested an arrangement of the steps in broad and narrow flights, which, Mr. Wood argued, was inadmissible. It was further shown how, in the investigation of these and other details, he was brought into contact with the debris of every one of the three successive temples which had occupied the site. The earliest of the three was that begun towards the middle of the sixth century, before the Christian era, under the architects Chersiphron and his son Metagenes, and to which the Lydian King Croesus so liberally contributed. This temple appeared to have been adorned with sculptured columns, as fragments of archaic bas-reliefs attached to a rounded

surface were found on the site, and were now to be seen in the Archaic Room at the British Museum. A large lion's head, and some other fragments of antique sculpture, found in some foundation piers of a later age, must have come from the earliest of these three temples. The second temple was begun in the early years of the fourth century by the architect Paionios. The last temple was begun in the time of Alexander the Great, and must have been already far advanced when he came to Ephesus, since he proposed that he should be allowed to dedicate it to the goddess in his own name. Mr. Wood said he had ventured to place two altars on the platform at the western end, one for animal sacrifices, and the other for such offerings as the fruits of the earth. In his account of the cultus of the moon-goddess, to whom, as well as to her brother, the sun-god, human victims were anciently sacrificed, Mr. Wood said he was largely indebted to the erudition of Professor Paley, who thought that the great statue must have been hypæthral, because it was an object to let the moon shine straight upon it, and that it would stand close to, and, as it were, preside over the principal altar. Mr. Wood mentioned a suggestion of his own in conversation with Mr. Fergusson as to the Hypæthron, that these openings in the roofs of temples harmonised well with the ancient Greek belief that the gods floated in the air, and would at times descend thereby into their temples. Mr. Fergusson's reply was, "Let them walk in at the door like other people!" Mr. Wood next pointed out the monumental verifications of his views as to the width of the temple itself and to the position he had assigned to the columns. He explained why he had not felt at liberty to make such a restoration of the Temple as would better satisfy the desires of those who, with good reason, imagined that groups of sculptures, bas-reliefs and statues, in addition to the sculptured columns or frieze, were needed to account for the lavish admiration bestowed upon this world's marvel by the ancient writers. He stood in awe of the peril of dwarfing the grandeur of the building. He had, however, ventured to put statues on pedestals against the cella walls. One of the most important points of difference between Mr. Fergusson and himself was in respect of the number of external columns. He accordingly vindicated his own punctuation and rendering of the Plinian text, "One hundred columns, twenty-seven the gifts of kings." This, he contended, was more correct than the removal of the comma and making Pliny say there were "One hundred and twenty-seven columns the gifts of kings," as Mr. Fergusson did. Room had been found for one hundred columns, but not for more, and if there had been one hundred and twenty-seven they could not all have been given by kings. Rich private individuals and communities would give some, and he himself happened to find part of the base of a column, showing that it had been given by a Sardinian lady. The most interesting feature of the Temple must have been the sculptured columns, thirty-six in number. To an account of these, of the Temple volutes and architraves, as also of its cymatium and marble roofs, the remainder of the paper was devoted.

The Chairman (Mr. Ewan Christian, President) was sorry Mr. Fergusson was unable to be present owing to illness, but he had seen an abstract of Mr. Wood's paper, and had sent some observations in reply.

The Hon. Secretary then read the following letter:—

"I regret extremely that I am unable to be present at the meeting of the Institute this evening, as I should have liked much to have had an opportunity of explaining personally why I differ so essentially from Mr. Wood regarding the restoration of the Temple of Diana at Ephesus. It would also, of course, have been advantageous that I should have heard all that he has to say on the subject before attempting a reply; but I have before me an abstract of his paper, prepared for your Proceedings, which is quite sufficient to enable me to understand the principal points of difference between our two restorations. In the first place, I object in toto to his arbitrary insertion of a comma, where none exists, into a singularly plain sentence of Pliny's, but which alters its sense entirely, and so far as I can see, makes it read very like nonsense. As it stands in the text, it simply says, 'There are one hundred and twenty-seven columns' (in the peristyle of the Temple), 'the gift of several kings.' Alexander offered to give the whole, if allowed to dedicate the temple to the goddess in his own name. His offer was rejected, but other

donors, not necessarily kings, as we understand the term, supplied his place, each giving according to his ability. Of course when a sentence seems perfectly inexplicable, or at variance with facts ascertained in excavation, the insertion of commas and stops, or even alterations of the text, are allowable, but only as temporary suggestions to get over what appear to be insuperable difficulties. When, however, it dawned upon me that thrice nine made twenty-seven, and when on protracing them I found that nine pillars, with the usual intercolumniations of 16 ft. 4 in., made up the same dimension that was occupied by the widely-spaced eight columns of the front, the riddle was guessed and the problem solved. When worked out, as shown in the plan published in your Transactions, it was found that not only did every dimension quoted by Pliny come out exactly correct, but every paragraph bearing on the subject in Pliny, Pausanias, Strabo, or any author in ancient times, was verified and confirmed. The only wonder to me is that Mr. Wood did not at once adopt this suggestion, which got him not only out of his translation difficulties, but rendered the temple he had discovered with such infinite labour so much more worthy of the character for magnificence which it bore throughout the ancient world. Instead of this he adheres to a plan in which only one dimension comes out correct, and that not ascertained by excavation, but adopted from Pliny. In the only plan he has yet published it is quoted as 415 ft. 1½ in., as ascertained by excavation; he now adopts 425 Greek feet (430 English), which is the dimension for the length given by Pliny. It is strange that while Mr. Wood will not allow that this author could count the columns, which were then all standing, and their number a matter of notoriety known to all the world, he should admit that he could not settle the question of the temple, a very much more difficult operation, to within 1 ft., though he failed, according to Mr. Wood, to ascertain the breadth, 220 Greek feet, which being about half the other, was certainly an easier operation. Not only did the adoption of 127 columns get over all the difficulties regarding the dimensions quoted by Pliny, but the very much more serious one that all antiquity declared the temple at Ephesus to be the largest as well as the richest in all Asia. Pausanias, for instance, says (Book VII., ch. v.) that it is larger than that at Didyme, whose dimensions are perfectly well known. It had 120 columns 64 ft. in height, while Mr. Wood represents that at Ephesus as possessing only 100 columns, and their height as only 55 ft. 8 in., a fact which, it seems to me, is quite sufficient in itself to settle the question. One of the arguments on which Mr. Wood insists is, that he found a 6 ft. length of the lowest step of the podium in such a position that there is no room for my 127 columns. There may be fifty ways of accounting for such a trifling fact, but that I have suggested in my paper is quite sufficient. Strabo's account of the addition made to the temple after it was finished by Chersiphron, not only suggests, but seems to require, such a buried step. But I do not see that Mr. Wood has turned his attention to this, or attempted to explain the passage otherwise. In fact, the Institute have now before them two plans of this famous temple, one of which professes to explain every dimension handed down from antiquity, and to reconcile them with every discovery Mr. Wood made on the site, and to offer a reasonable explanation of every fact mentioned by any ancient author. The other does not pretend to agree with any passage in any writer of antiquity, except by a forced and most onerous mode of interpretation, nor to agree with any one dimension given, except one which was not ascertained by excavation, while from the smallness of its dimensions it contradicts all history. I cannot quite make out whether Mr. Wood still adheres to his theory that the heavy blocks, carved on two faces, are parts of the frieze of the Temple, or are square pedestals of certain of the pillars, as I suppose; but as the blocks are now arranged in the Ephesian Gallery of the British Museum, any architect can judge for himself, and I shall be excessively surprised if any one agrees with him. In the meanwhile it would assist materially in settling the question if he would let us know where they were found. As there are certainly four, probably five, of them, they must, if parts of the frieze, have been found near the four angles of the Temple. As far as I can make out from his published work, this was not the case. When he puts into tangible form his ideas of the hypæthron, it will be time enough to consider them. Still he does so I can only say, with all due deference to the learning of Professor Paley, that those expressed in this paper appear to me only as examples of a hazy mysticism which I am astonished that any practical architect should adopt. JAMES FERGUSSON."

Mr. Penrose.—I have not seen the excavations on the site of this Temple at Ephesus, but I think we should be extremely thankful to Mr. Wood for the energy he has displayed. I wish he had been able to go nearer to the statement of Pliny and his description than he has shown, in the paper read this evening, that he is disposed to do. In this respect I must hold with Mr. Fergusson. I think Mr. Fergusson's working-out of the 127 columns is remarkably ingenious. Mr. Fergusson claims the change in the design in consequence of the

hill which rises eastward from the Temple. I should be glad to hear from Mr. Wood, from his knowledge of the spot, whether he considers that the hill comes so near the Temple as to make the view of the front of the building comparatively unimportant; or has it a gentle slope which would not materially modify the aspect of the Temple?

Mr. R. P. Pullan.—I was not there when the Temple was thoroughly excavated, but was at Ephesus several times before Mr. Wood made his discoveries. I am glad to find that Mr. Wood is about to publish details of his discoveries, because it is perfectly impossible to make a restoration unless every stone found is measured and the measurements published. I have had some little experience in digging up temples and making restorations of them, and it is my practice to measure every little stone found in every possible place, for a missing link would spoil the whole of the restoration. In Ephesus there were very few remains found, but it is to be hoped some part of the pavement will be found, because the pavement is a great guide as to the position of the columns. Even if half a dozen steps were found it would give some idea of the places of the columns. Mr. Wood has worked hard for years at this exploration, and is deserving of our thanks. If Mr. Fergusson's idea is the right one, then I must say this temple must have been a *lucus templorum* if it were like Mr. Fergusson's design. There is only one point on which I would criticise both Mr. Wood's and Mr. Fergusson's restorations. I have dug up three Ionic temples, and in no case did I find anything like sculpture on the pediment.

A vote of thanks was then passed to Mr. Wood for his paper, and the meetings were adjourned to the first Monday in November.

IN NORTH-EAST HERTS.

THE cave at Royston, being a great rarity, a goodly number of people go into it every year. The St. Alban's Architectural and Archaeological Society visited it recently, in the course of a day spent pleasantly in a look at Royston, and a drive up the hills to Thirfield and over to Anstey. The so-called cave, which resembles in the main a circular-domed water-tank, is about 17 ft. diameter, and the height from the floor to the surface of the street above it is 28 ft. The grated eye, just by the side walk, was pierced through the crown probably at the end of the last century; it did not exist at the time of the discovery in 1742. Then, and till 1790, the only access was by the shaft now to be seen from below. In 1790 a bricklayer employed his workmen during a hard winter in making the inclined way, 72 ft. in length, cut in the chalk, which now affords very comfortable access from the side of a gateway on the opposite side of the Ikenhilde or Icknield-street,—the Icknield Way in fact, part of the very old road from the eastern counties to the south-west. For about a couple of miles east, and four miles west of Royston, it now marks the line of division between Cambridgeshire and Herts. In 1742 the "Mercat House" stood above the cave, and a post was wanted, according to Stukeley's detailed account, "to nail a bench on for the use of the market women." The men came on a stone with a hole in it, then on a shaft about 2 ft. in diameter and 16 ft. deep, and then on a cavity filled with loose earth, of which they cleared out 200 loads. The Rev. George North, Rector of Codicote, went there before the clearance was completed, and reported to the Society of Antiquaries; and Dr. Stukeley that "mixture of simplicity, drollery, absurdity, ingenuity, superstition, and antiquarianism" as Warburton affectionately wrote of him after his death (1765), went down shortly after, found it cleared of earth, went again, made sketches, and the next year his "Origines Roystoniana" was published.

Camden, without naming any authority, had attributed the erection of the old cross which formerly stood at the junction of Ermine-street and the Icknield Way, to Lady Roisia,—thence getting Roysse's Cross, Roysse's Town, Royston. This may have been local tradition or conjecture. At present the erection of the original cross is by the best conjecturers fixed at a time before the Conquest. Stukeley made the Cave,—"the Oratory of Lady Roisia, Foundress of Royston,"—and explained in a fitting way the intention of the sculptures which surround it to a height of 8 ft. from the floor. These sculptures

are in flat relief,—the chalk which holds together fairly having been cut back round them. Many are still in good preservation, probably much the same as they ever were, barring the loss of the colour which was applied to parts, if not to the whole. A very careful examination of them all was made about thirty years ago by Mr. Beldam, the modern authority on the subject; and vestiges of red, blue, and yellow were visible in various places;—the relief of the figures had been assisted by a darker pigment. They are not to the same scale, nor apparently connected in subject, nor arranged according to any scheme. They are dotted about on the wall,—no doubt not done all at once,—perhaps done by different people, with different degrees of skill, none very skillful. Stukeley's "imagination fongueuse, qui lui faisait commettre les erreurs les plus fantastiques," led him to a comparison between the Bayeux tapestry and the Cave, and to the following climax:—

"And as Montfaucon's tapestry is indubitably the noblest monument of English antiquity abroad, so is our Roiston cave the noblest monument of English antiquity that is in England, or that has been discovered in our time."

We see by means of the Stukeley papers, now being edited by the Rev. W. C. Lukin for the Surtees Society, that the Doctor had in August, 1744, a private suspicion that his tract had been a little too effusive. At that date he wrote to S. Gale:—

"The Doctor [Knight] told me that it was one Parkyn who is writing against Lady Roisia. As I only write to please and to amuse myself as well as others, and did not bestir more pains than are proper in such matters, I shall not discompose myself to answer such a sorry trifler, who has nothing else to do than to contradict things of no importance to mankind."

When "An Answer to, or Remarks upon, Dr. Stukeley's Origines Roystoniana" was published the same year by the Rev. Charles Parkin, Stukeley did not take things quite so calmly. Parkin seems to have been irritated by Stukeley's assuming a sort of property in the Cave, making too much of it, and interpreting the sculptures in too secular a way; also generally by a desire to take the other side. Stukeley, like a true champion, made Roisia's cause his own, and fought fiercely in her honour. The rebellion of 1745 stopped the publication, but in 1746, 135 closely-printed pages came forth "in defence of Lady Roisia de Vere against the calumny of Mr. Parkin." Not that Parkin had spoken worse of Dr. Stukeley's lady than to say that she had probably nothing to do with the oratory, and could not have been buried there as asserted, it being on record that she was buried elsewhere. Since 1746 no one has contended that Lady Roisia executed the sculptures personally. E. Smalwell, writing from Lynn [Parkin was a Norfolk man] in March, 1745, reported to the Doctor after investigation, as to the character of "Perkins, that impostor and usurper." Such loyal support of a friend is beyond praise. The Rev. G. Burton, reporting in 1747, was more moderate, only finding "Parkins a designing, wicked, and faithless wretch." The varied nomenclature of the wretch is evidently no wreaking of vengeance on his name; that refinement is mainly a modern improvement due to more orthography, which has made loose spelling a crime or an intentional insult. Mr. Lukin remarks in his preface on Stukeley's pleasant freedom from all irksome rules, his words take the form convenient at the moment. Parkin was, no doubt, a very worthy person. Blomefield, in his preface to the "Norfolk," thanks "the Reverend Mr. Charles Parkyn, Rector of Oxburgh, for pains and great assistance, which can never be sufficiently repaid." Before the completion of his third volume Blomefield died, and Parkin carried the great work to completion. The Surtees Society's publication gives us an unexpected and slightly unfair glimpse behind the scenes. Masters was working at his history of Corpus Christi College, Cambridge; and the Druid Chyndonax, as Stukeley proudly called himself, supplied authentic notes to assist in the writing of a memoir of a distinguished member of the college:—

"He published the account of Lady Roisia's sepulchral cell lately described at Roiston. 1745,—one Mr. Parkyn took it into his head to make an awkward answer (as he calls it) to Dr. Stukeley's account being at unkindness treatment of the Doctor, and an unconnected, old account of that antiquity of his own. The Doctor answered it, but on account of the rebellion deferred the publication till 1746."

A pensive smile must come upon the face of the reader, who observes how this was "boiled

down" for the actual publication in 1753. In the interval (1748) Parkin had published his "Reply to the peevish, weak, and malevolent Objections brought by Dr. Stukeley. . . . Royston proved to be an old Saxon Town, and the History of the Lady Roisia shown to be a meer Fable and Figment." The concluding allusion in Masters is jaunty:—"Mr. Parkin replied in 1748, but I don't find that the Doctor has taken any further notice of him." The Rev. Dr. Griffith, of Sandridge, touched but lightly on these instances of self-sacrifice,—bent upon making examples for us and assisting in the formation of our opinions. Addressing the visitors in the Oratory, he stated that he was disposed to adopt several of the conclusions of Mr. Beldam. The first shafts may have been sunk in the times before the Romans; it may then have been used as a Roman sepulchre. Being enlarged to its present size,—most of the carvings were done in the reigns of Henry II. and Richard I. There was a William de Magnaville, the favourite son of Stukeley's Lady Roisia, who was with Richard in Palestine, and who may have had something to do with the selection of subjects. It may have been an oratory before that time, perhaps attached to a hermitage. After the Reformation somebody felt satisfaction in filling it up with remains of the Priory buildings;—in the course of, perhaps, 200 years after the filling up all remembrance of it had been lost. We would add that there were rivalries in those days also; and that, unless this one was poorly appreciated, discoveries of other caves may yet be in store;—some contemporary notice of this cave may also be unearthed some day, to the gratification of all those who are only moderately satisfied with possibilities and conjectures, however ingenious.

In Royston Church, which was next visited, there are three Early English windows on each side of the chancel, of rare beauty and richness, sadly mutilated as the result of after-changes; well-moulded piers in the arcades, the remains of an Early Perpendicular screen used up in the pulpit and desk, and some brasses. The Rev. H. Fowler read a careful and most interesting paper, from which we make a few extracts:—

"This church is in Hertfordshire, in the ancient Hundred of Odsey, not many yards from the old British track of the Icknield Way, which at this point is identical with Melbourn-street, and passes along on the line of Baldock-street. It crosses the Roman military road of Ermine-street at the point where the ancient cross stood, and is the boundary line between Herts and Cambridge. Previously to the institution of the vicarage in 1540, we are told that the town was situated in five parishes. The town of Buntingford, about eight miles south, is in several at the present time. I am not sure whether those at Royston all met at the ancient cross. Leland says:—'There touches, as I learned in that town, jurisdiction of London, Ely, and Lincoln dioceses.' In early Saxon times the cave, with perhaps a cross above it, may have marked a point in the boundary between the Mercian and East Saxon kingdoms. . . .

The oldest extant charter,—that of Richard I., dated Nov. 10, 1189,—confirms:—'To the monastery of St. Thomas the Martyr apud crucem Robesia and to the canons there serving God, the site of the monastery and its appurtenances, which Eustace de Moro [quory, March, Isle of Ely], the founder [c. 1180], and Ralph de Rowcester [Rochester], and other faithful men have reasonably granted to them.' Little is known of Eustace. . . . It is probable that there was always a close connexion between the oratory at the cross and the priory. The fame of the Hermitage might, indeed, have had something to do with the selection of the site of Eustace's monastery. . . .

The length of the choir, of two bays only, would be about 30 ft.; thus, with the return stalls, there would be accommodation for between twenty and thirty canons. The monastery belonged to the Augustinians. There were three other religious houses of this order in Herts, all small; and 175 in the whole of England. . . .

It appears that the inhabitants of Royston had the right or privilege of worshipping in the western portion of the church of the canons. Leland writing reg. H. VIII., states, "in the town is but one Chirche, the Este part whereof servid for the Priory of Chanons. The west ende servid for a Chapel for the townes." We have seen something like this arrangement at St. Alban's and at Dunstable,—though in these cases it was an aisle of the nave or a chapel

annexed to it which was so used. At Dunster, Somerset, it was decided in 1499, by the Abbot of Glastonbury, that the monastic choir should be resigned to the sole use of the monks, and that the parishioners should use the nave. At Sherborne Abbey, the parochial church of All Hallows was attached to the west end of the conventual church, the easternmost bay being a vestibule common to the two churches.

Clutterbuck and Cussans both state that a large arch, now covered up by the casing of flint, formerly existed on the western face of the tower; good evidence from the building that the church extended thence westward. Leland's statement runs, 'Now all the tounse is allottid to one parochie and that ys kept in theeste ende of the priory and the west ende is pulled down.' At Dunstable the eastern portion was pulled down or allowed to fall into decay. Waltham is another similar instance. At Hoxham, the nave has been taken down, only a slip being left as an abutment to the tower, and the eastern part of the church has been retained as at Royston; and there are plenty of other cases in which a church, converted from conventual to parochial uses, has lost a limb. I conclude that the original priory church consisted of a choir with aisles, a sacristy or chancel, central tower,—all which we see; and transepts and nave, which have disappeared . . .

The site of the Priory was granted after the Dissolution to Robert Chester, of Barkway,—a member of a family which seems to have been prominent in the county for about two centuries,—from the middle of the sixteenth to the middle of the eighteenth century. The fabric of the church was reserved to the king. The Act of Parliament by which the vicarage was constituted (out of five parishes as mentioned above) in 1540 states,—'The church, of which priory the poore inhabitants of the said towne have bought to their great charges, to thintente to have the same their parish church, and therein to have daily masse,' &c. We are reminded by the wording of the Act that reformation in doctrine and ritual had not yet taken place. This was just after the passing of the statute of the VI. Articles, 31 H. VIII. (1539); repealed 1547; and the vicar was required to celebrate daily mass.

With regard to the monastic buildings,—they stretched along the south side of the church, extending probably nearly the whole of its length. They may have remained for some time after the Dissolution. When pulled down they were available for use in the large residence, called the Priory House, built by Sir Robert Chester. It is described in the report of the Commissioners of Queen Elizabeth as a large irregular mansion, about 35 yards long by 30 yards wide, having an outer and an inner court, and sixteen rooms on the ground-floor, including the kitchen. The queen thought of making a stay here, in a progress through the country in July, 1578, but the account given of the house was not sufficiently inviting. Dr. Stukeley tells us that in 1742 a fine kitchen was still standing, and various ruinous parts. The old wall of the precinct still remains, I believe almost entire, and encloses beautiful grounds. The modern house belonging to Lord Dacre is said to be on the site of the Priory barn. It was in the old Priory House that James I. was the guest of Robert Chester, son of the Sir Robert Chester,—in April, 1603, on his way from Scotland,—when he was so delighted with Royston that he determined to build the hunting-box, part of which remains in Kneesworth-street.

Of the hunting-box from which James set out so often for "shooting the dotterel and hunting the hare" very little now remains. Kneesworth-street was formerly Arnyng (Ermine) Street, it was so in 1610 when a survey was made of the late dissolved Priory and the whole parish of Royston. The few moulded beams and an underlighted panelled room, grained dark walnut, are regarded with little admiration by the occupiers. The exterior is now neat brick with red gauged arches and strings,—work which might belong to the last century, or equally well to 1812, when the property passed into private hands. This Palace (so-called) is in Cambridgeshire. James went out with the hounds about three times a week. It has been suggested that there was mischief meant, in pointedly mentioning the dotterel and the hare as the favourite prey of his Majesty. The dotterel was credited with much stupidity, getting his name from *dote*, at a time when that word was used not only for

foolish fondness, but for folly without the fondness. The ape-like movements of this long-legged wader, a kind of plover, are, no doubt, diverting; but to a king fond of his "kingcraft," its simple manners, its want of fear of man owing to ignorance of his ways, would be, if possible, still more diverting. Drayton, on the sports to be made out of the gestures and simplicity, will be called to mind:—

"The dotterel, which we think a very dainty dish,—
Whose taking makes such sport, as no man more can wish.
For as you creep, or cower, or lie, or stoop, or go,
So, marking you with care, the spish bird doth do;
And acting everything, doth never mark the net,
Till he be in the snare which men for him have set."

Charles I. was much at Royston in his early youth, but does not seem to have made much stay at this favourite resort of his father's after his accession. On the 24th June, 1647, he was at Royston, when brought from Newmarket in the custody of General Fairfax. This was the last occasion of his being there. The estate came to the Crown at the Restoration, and was finally parted with in 1812.

From the hills about Thelfield the prospect over the flat land of Cambridgeshire and Beds to the north and west is extensive. Ely in a straight line is about thirty miles off, and Cambridge as near as possible half way along such a line. These hills are the division of the waters. The Cam rises about six miles north-west of Royston, near Guilden Morden, the parish containing the manor or grange of Odsey, from which the Hundred takes its name. Any one following the Rib, from its junction with the Lea between Hertford and Ware, will pass,—

"To Withihall, to Buckland, and to Barkway both,
Where is the head and vein of utmost Ouse;
Of this surpassing cleere and goodly stream,—
The greatest branch that feedeth christall Lee."

The Little Quin, which joins the little Rib at Braughing, comes down from Anstey. Thus the water from the northern slopes of the hills reaches the Wash, and that from the southern the Thames. Thelfield is Tharfield in local speech, and sometimes in print, as the rector, the Rev. J. G. Hale, stated in the course of a paper, well illustrated by old maps, books, documents, and views, read in the large rectory room, erected for use while the new church was building. The rectory, the residence of so many notable men, stands close by, a very comfortable structure in good grounds, with some remains at the kitchen end of an old house, multilined windows, part of a circular turret, &c. The new church is pointed to as a piece of lasting work, done for posterity; some bits of the old church were preserved and worked in, and the inscribed beams and other fragments, not yet put into the new building, will no doubt go there shortly. The bells are at present in a wooden shed built round a large tree, as the church tower is only projected at present. No one doubts the insecurity of the old church; well-known views and photographs make that pretty clear, without comments. For the loss of some of its least-liked features, it is permitted nowadays to feel a slight regret. The chancel had, it is true, a flat plaster ceiling, with an oval centre and floral wreaths round; but it was a memorial by "an inconsolable husband to an incomparable wife" that is, by Francis Turner, who was instituted here in 1664, and lost his wife in 1677, aged 28. He was one of the seven bishops of 1688, deprived as a non-juror in 1690, and was buried here in 1700, "without any memorial except the word 'Expergiacar' engraved on a stone over the vault." Clutterbuck (1827) did not seemingly note the existence of the stone. Mr. Hale mentioned his distinguished predecessors in his paper: "Bishops held the living with their sees,—deacons and archdeacons, canons residentiary from Durham to Exeter, Masters of the Temple, and heads of colleges."

After a drive of about six miles the party went up the moated castle mound at Anstey, reaching a carefully-kept bit of green sward, said to be a quarter of an acre in area, secluded from the world by the green leaves of trees planted on the tall slopes. The first castle was built in the eleventh century. In the thirteenth Nicholas de Anstie was ordered by Henry III. to demolish so much of the building as had been raised in wars carried on against his father. There had been trouble from it: the small mounds on the north may mark the site of the buildings which were pulled down. The rest remained until 1400. Now there is no trace of building above ground, though digging has revealed a bit of foundation.

Canon Davys gave an address on the mound, and afterwards read a pleasant paper in the church situate just to the south,—a cruciform church, with central tower and short spire. Tower-arches of the Transition and a very early font remain. Materials from the castle may have been used elsewhere,—for instance, in the fine Early English windows in the chancel,—very nicely treated. The nave arcade is well moulded, small quatrefoil windows are packed into the spandrels between flat-pointed arches, a method of obtaining a tallish arcade and a clearstory in a wall of very moderate total height, more to be commended for its good intention than for its beauty as it stands. The buttresses round on plan on the lower stage, the fine hagiostopes from the transepts, the beautiful monument in the south transept, and the late stall-work should all be well noted.

In returning to Royston a glance was given at the church at Barkway, and at one or two houses in the taste just now so well relished, "and so home."

It is with sincere regret that we record the death on Sunday, June 1st, at the early age of forty-two, of Mr. Ridgway Lloyd, who was buried on the 6th under the shadow of the north aisle of the Abbey Church at St. Alban's, in the history of which he had taken so special an interest. Much sympathy was expressed at a business meeting held during the excursion on the castle mound at Anstey; but the fatal termination of the illness was, of course, quite unlooked for. He became one of the Honorary Secretaries of the Society in 1870. His archaeological studies,—pursued constantly and with ardour in the intervals of very active practice as a medical man,—had borne fruit and promised much more. Out of a number of papers and separate publications the following may be specially mentioned:—

"Campanology," *Inscriptions on Church Bells*, &c. 1872.

"An Architectural and Historical Account of the Shrines of St. Alban and St. Amphibalus in St. Alban's Abbey." St. Alban's: Langley. 1872.

"The Altars, Monuments, and Tombs in St. Alban's Abbey, A.D. 1422. Translated from the original Latin, with Notes." St. Alban's: Langley. 1873.

"The Paintings on the Choir Ceiling of St. Alban's Abbey Church." St. Alban's: Randall. 1876. (Also, with Additions in "The Sacristy" (New Series, No. III., 1881).)

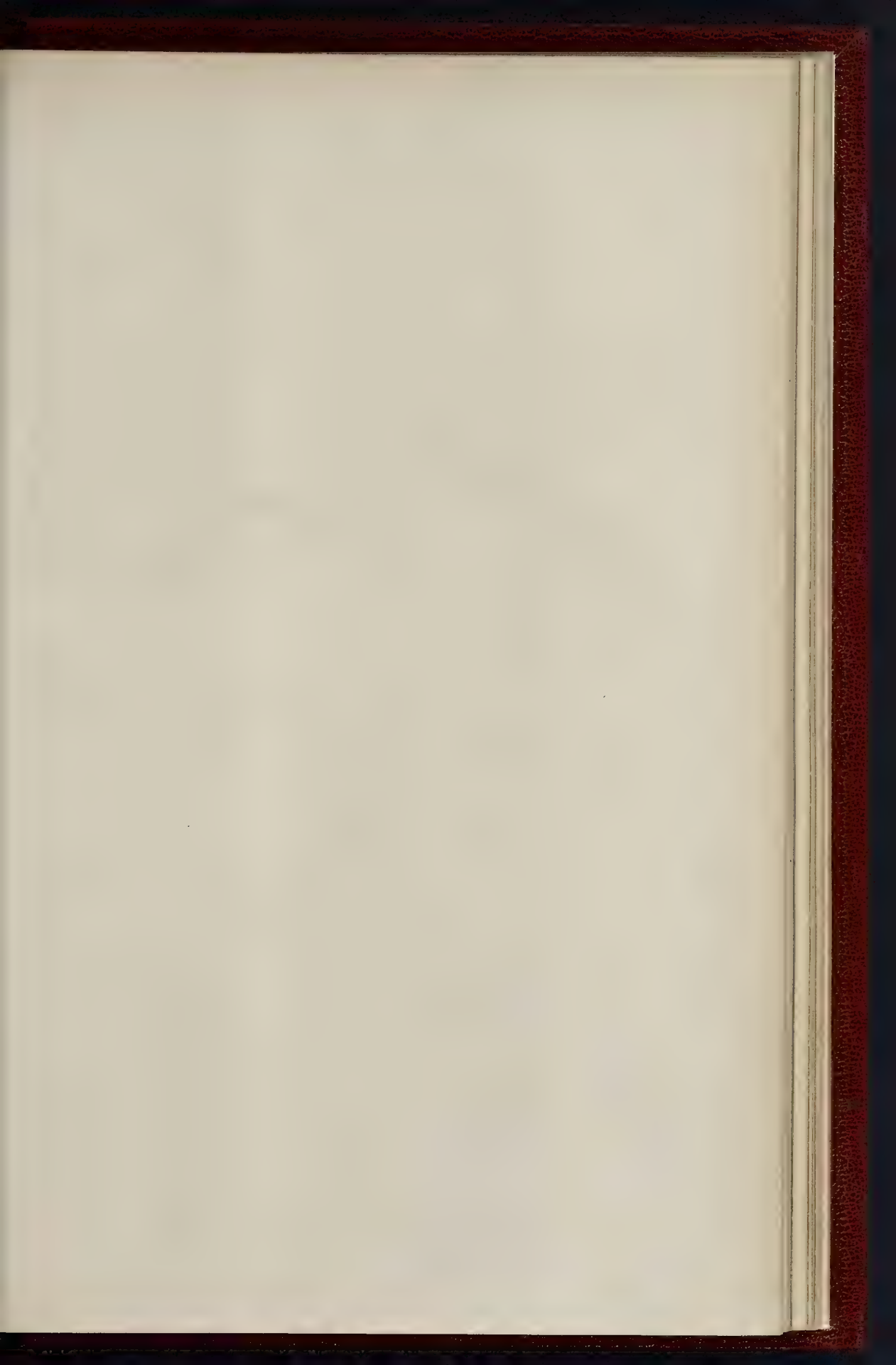
"A Medieval Pilgrimage to the Shrine of St. Alban." ("The Antiquary," vol. ii., No. 12, December, 1880.)

"Marford Bridge." 1881.

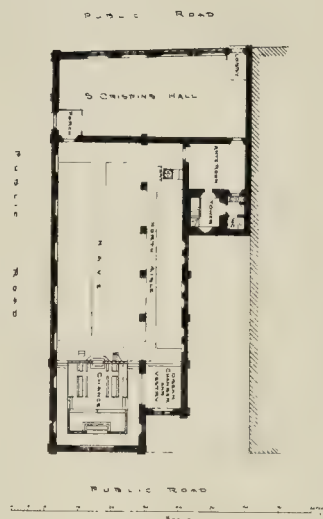
"The Wall Paintings in St. Alban's Abbey." Read before the Bedfordshire Archaeological Society. (*Archaeological Journal*, 1882.)

SCREEN IN CHOIR, CHARTRES.

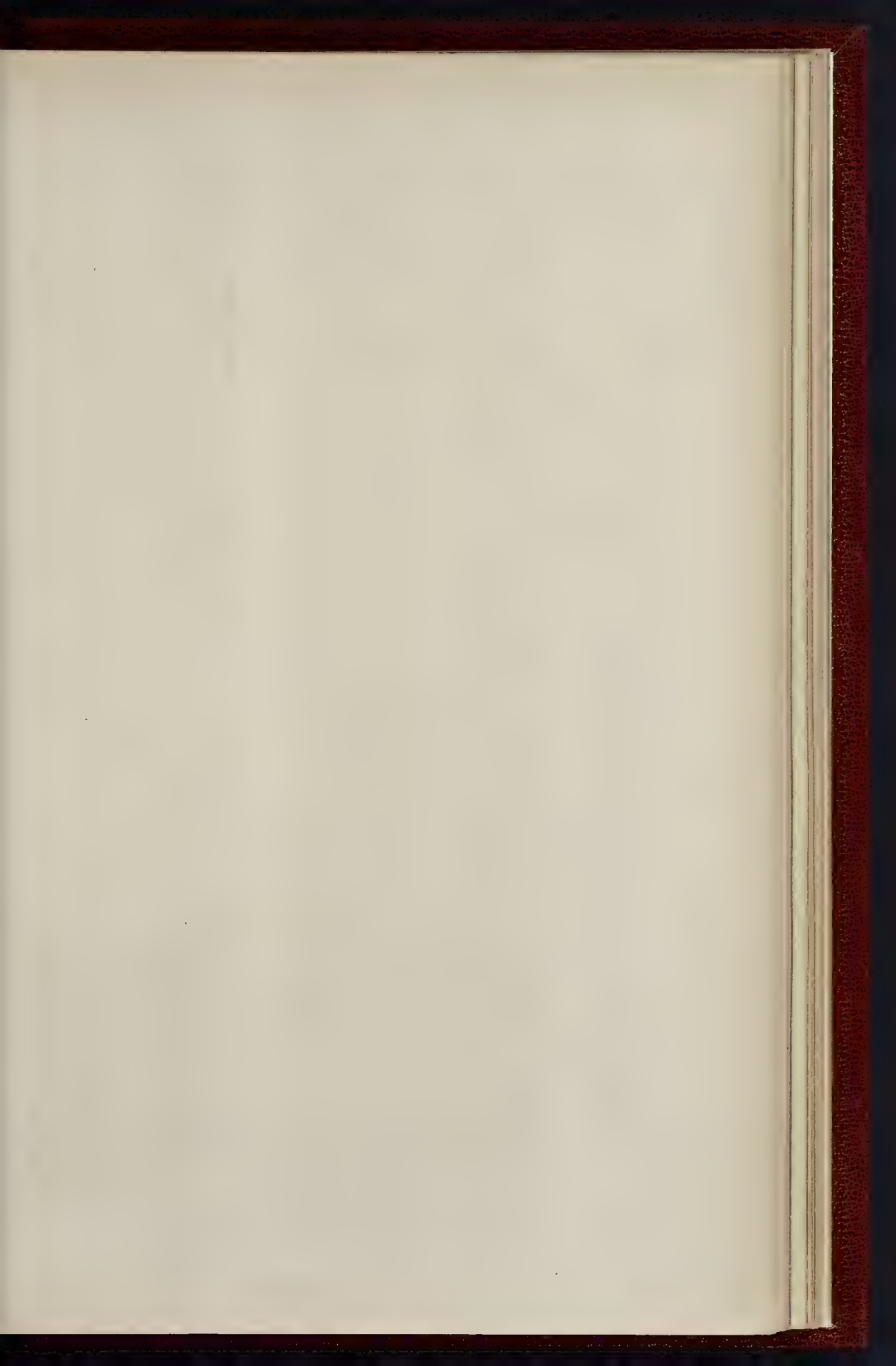
The illustration of this, as will be perceived, represents the view in the apsidal aisle at the eastern termination, showing the aisle side of the screen which separates the aisle from the choir. The sculptures run all round the semicircle, in no chronological order, however, and with an odd mingling of Biblical and imaginary subjects. In our view the two on the right hand are readily recognisable as the "Transfiguration" and the "Woman taken in Adultery." It is not very easy to say what the third one represents, but it is a curious incident in it that it includes the sculptured representation of a Classic church with a dome and peristyle and a segmental-arched head over the doorway, an incident very unusual in even Late Gothic sculpture. Another curious point about the general design is that it seems to get earlier in style as it rises, for the basement story of the screen, with its round arcading and panels with enriched moulding, seems to have fairly merged, if not into Classic, at least into the most debased Gothic; then comes a more Gothic-looking ornament over it, and the upper portion is Late Flamboyant. It is curious to see in the capital of the large pier behind the trace of the Classic capital, and then to see in the panelling of the screen the approach of the Classic element again, after all that has intervened. The scheme of the design is very effective, with the sculptures standing out against deep shadow, and the figures of modern historical bishops and saints placed, as it were, on another plane in the design, and marking its main division into bays. The contrast between the solid grandeur of the older Romanesque work and the lace-like fragility of the Late Gothic work, is as striking here as at Gloucester and elsewhere in our own cathedrals.



Mission Church of Saint CRISPIN.
Northampton. & Promoted by the efforts
of 500 Working Men. ARCHT. ARTHUR ARTHUR.

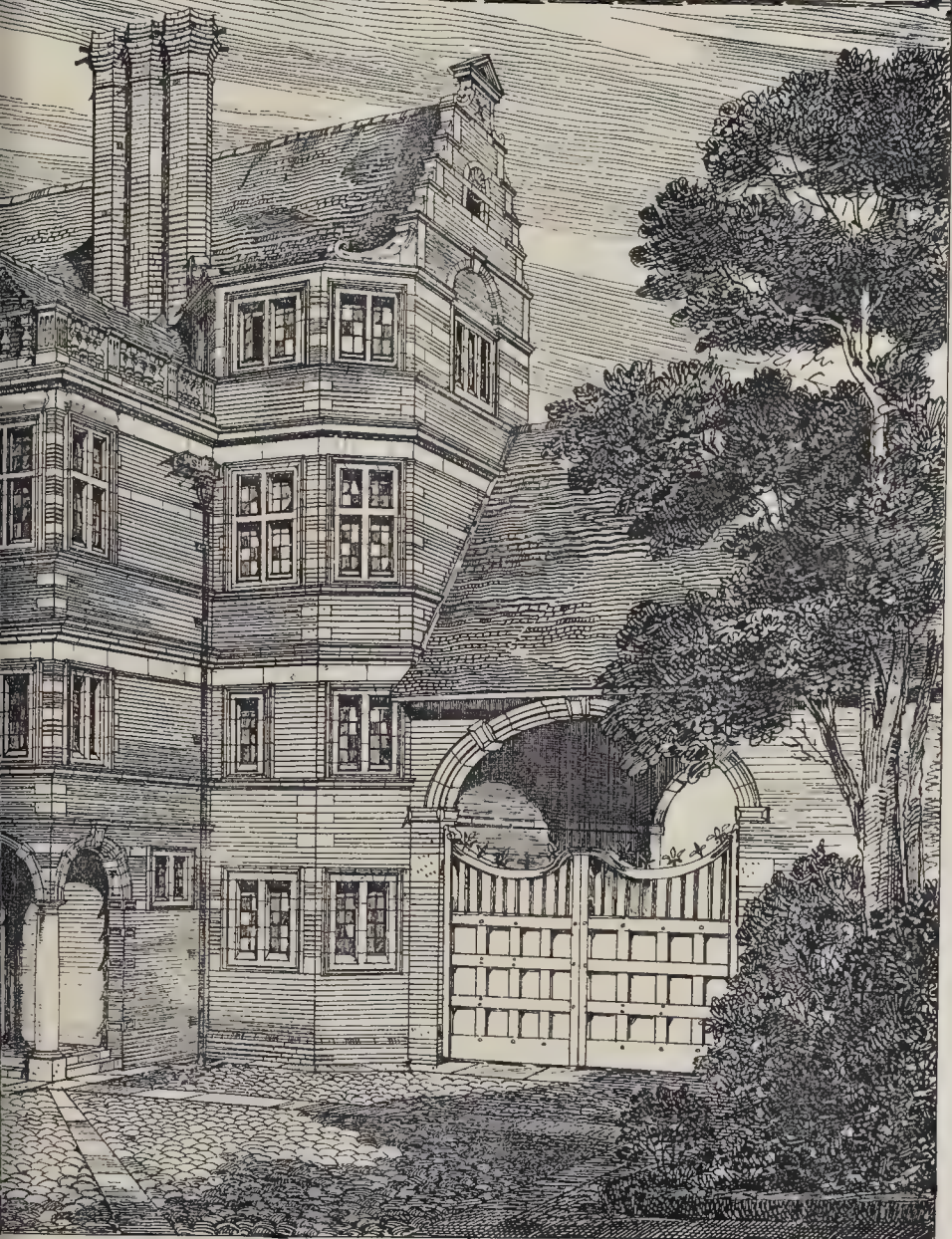
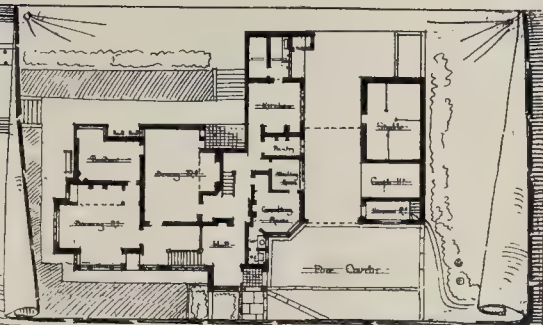


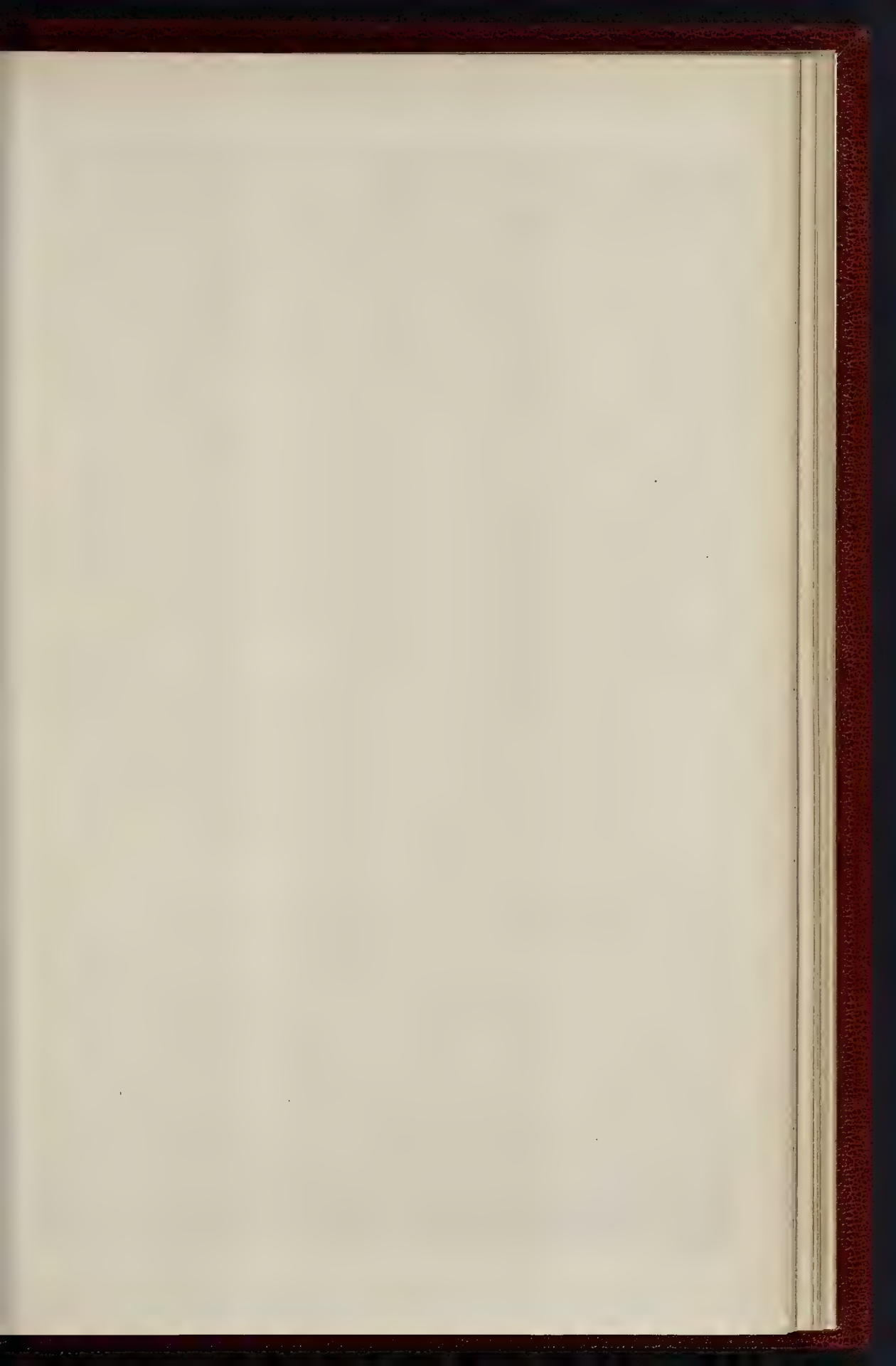
Architects: Messrs. Arthur & Arthur, Northampton.



Lodge, Harrow-on-the-Hill.

Edwin M. A. Architects.





THE BUILDER, JUNE 13, 1894



THE PHOTOGRAPH BY G. L. LONDON

CHARTRES CATHEDRAL: SCREEN ENCIRCLING EASTERN APSE.



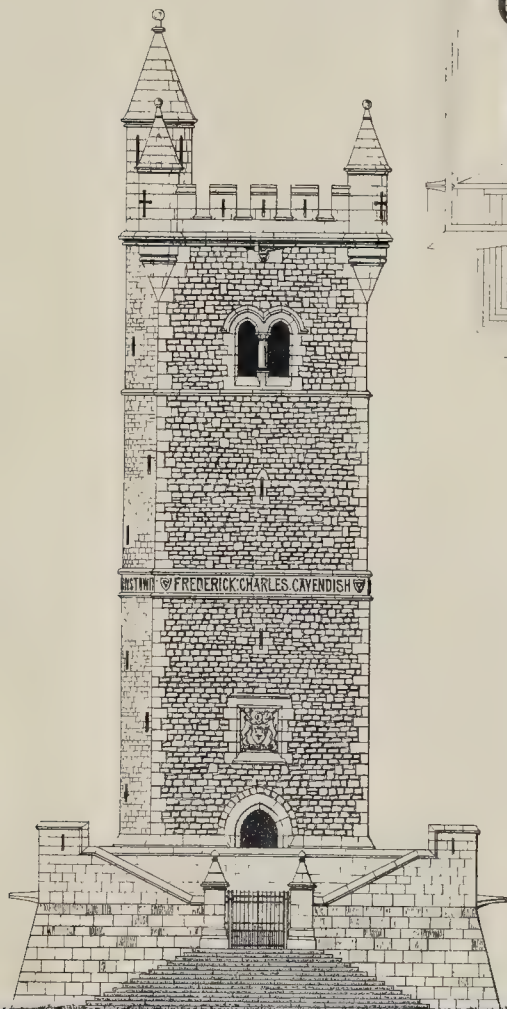
1/4 PHOTO SPRAGUE & CO. LONDON

SCULPTURE AT THE ROYAL ACADEMY.

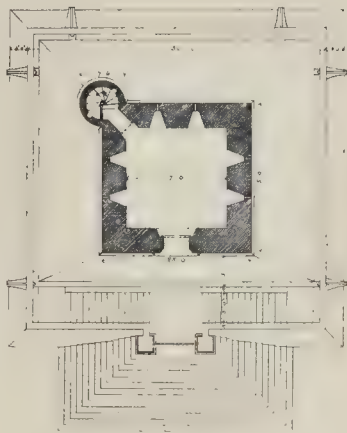
No. 4.—"YOUTH," BY MR. W. CALDER MARSHALL, R.A.

— MEMORIAL TO THE LATE LORD FREDERICK CAVENDISH —

— DESIGNED TO BE ERECTED ON THE SOUTH NAB NEAR BOLTON ABBEY —



— ELEVATION OF TOWER —



— PLAN OF TOWER, TERRACE AND STEPS —

THOS. WORTHINGTON, FRIDA
JOHN G. ELWOOD, ARCHA. ARCHT.
110 KING ST., MANCHESTER.
OCT. 1883.

MISSION CHURCH OF ST. CRISPIN,
NORTHAMPTON.

This church, with the buildings attached, is situated in the parish of St. Sepulchre, Northampton, so well known as being one of the few rural churches in the kingdom. The mission church which we this week illustrate is the outcome of the extended effort of the Rev. F. S. Thornton, Vicar, and a committee, composed of 300 working men, not only shoemakers but of various other trades, who have all taken a great interest in the work. The church itself consists of a nave and a chancel, measuring together 91 ft. long by 25 ft. wide, and with aisle, sacristy, and organ chamber. Across the western portion of the site is built St. Crispin's Hall, to be used for schools and various mission purposes. Connected with the hall and the aisle of the church is an ante-room, which will serve the double purpose of a retiring-room from the hall and for a choir vestry. Provision is made in the design for a tower and spire, the ground stage of which is at present erected, but this forms a means of access to the basement below the ante-room, where will be placed a Haden's heating-apparatus, that will warm the church and hall together or separately, and it also will contain coppers for boiling water for teas, &c. From the exterior door of the tower is reached a small yard, provided with a arinal and closet. The height of the side walls of the church is 18 ft. to the wall-plate and 35 ft. to the ridge. The whole of the exterior walls of the Church will be built of rich, hard brown Northamptonshire stone, and Westwood Bath stone dressings. The lower portion of the interior will be finished in fine chopped faced stone, and the upper portion plastered for decorative colouring. The roof will be covered with strawberry-coloured Broseley tiles, and the junction of the nave and chancel will be marked on the exterior by a tall fleche, and in the interior by an open wood screen. Tiles and wood blocks will be used for the interior floors. Accommodation will be provided for 350 persons, exclusive of the choir, and at the present time considerable progress has been made with the buildings, which are to be opened during the present year. The style of the church is a simple treatment of Gothic with some leanings towards Early French detail, in recognition of St. Crispin's connexion with that country. The architect is Mr. M. H. Holding, A.R.I.B.A., of 1, Market-square, Northampton, and the contractors for the whole of the work Messrs. Reynolds & Son, also of the same town.

MANOR LODGE, HARROW-ON-THE-
HILL.

MANOR LODGE is situated on the top of Harrow Hill. It is being executed in brick with terracotta dressings, from Messrs. Doulton & Co., Lambeth.

The photo-lithograph is taken from the drawing in this year's Academy. The contractor for the brickwork is Mr. Turner, of Watford. Mr. E. S. Prior is the architect.

SCULPTURE AT THE ROYAL ACADEMY.

NO. IV.—"YOUTH."

BY MR. W. CALDER MARSHALL, R.A.

This is a life-size figure standing against the north wall of the "lecture-room" in the present Academy exhibition. The sculptor of "Sabrina," which we can remember for so many years back, still delights in subjects representing youthfulness of physique and feeling. The modelling of the contours is very delicate, and the position of the figure graceful and well balanced.

MEMORIAL TO THE LATE LORD
FREDERICK CAVENTISH.

We publish this week the design selected for the memorial tower to the late Lord Frederick Cavendish, which it was intended to build on the South Nab in Wharfedale, near Bolton Abbey, on the moors above Barden Tower.

It will be remembered that in the autumn of last year the committee adopted the design of Mr. Thos. Worthington, F.R.I.B.A., of Manchester.

The working drawings and specification have since been prepared by Messrs. Worthington & Elgood, and estimates obtained from several

contractors, but just as it was on the point of settlement a memorial was addressed to his Grace the Duke of Devonshire, in the form of a protest from certain artists and others against any monument being erected in Wharfedale, which they imagined might interfere with the contour of the lines of the landscape.

We understand that no definite course of action has yet been determined on by the committee.

LIVERPOOL OPINIONS ON THE MAN-
CHESTER CANAL SCHEME.

The following is a portion of a letter from Sir W. Forwood, which appeared recently in the *Liverpool Daily Post*, and may be of interest at the present moment, as representing the view which those who have large interests in Liverpool take of the matter:—

"Our opposition is not a commercial opposition; we have no fear of the competition of the Canal, but we have the gravest apprehension of the injury which the proposed works in the estuary will cause to our bar and to the approaches to our docks. Therefore the great weight of the opponents' evidence has been directed to prove this."

Our commercial evidences has been simply to combat the estimate of the benefits which the promoters state Lancashire will derive from the construction of the Canal; and we think we abundantly proved how utterly insignificant and contemptible these would be when compared with the damage which will be done to our port by the proposed works.

Mr. Leader Williams and Mr. Abernethy, the engineers to the Ship Canal, both stated, without any qualification, that the bar was maintained by the scour of water on the ebb tide, and that the reduction of the tidal capacity of the estuary would be of serious consequence to the bar.

The estuary is like a bottle, the neck representing the Crosby Channel, terminated by the bar; the bottle, which is ten miles long by three to four miles wide, is filled by the incoming tide. Directly the tide turns, this large reservoir of water empties itself by rushing violently through the neck at a speed of five or six knots an hour, scouring away in its progress the deposits of silt and sand, and so keeping the bar clear and preventing it silting up. Without this rush of water the ebb tide would probably find its way out, meandering quietly through a number of shallow gullies which it would form in the sandbanks, and which would not be navigable except by small vessels.

It has been estimated that a spring tide comes in laden with 100,000 tons of sand held in suspension. At slack water, which takes place at the top of high water, a very large portion of this is deposited on the banks; and the upper estuary, that is, the portion of the river above Garston, would quickly silt up if it were not for another silent force of nature known as 'fretting.' The channel above Garston oscillates or wriggles about from one side of the estuary to the other, and in doing so it erodes and undermines its sides, which tumble in, and the sand thus dislodged is swept out by the ebb tide. This wriggling motion of the channel keeps the whole of the sand in the upper estuary in a sort of perpetual motion, and prevents accretion; by this means the tidal capacity of the estuary is maintained.

Manchester proposes to form a channel through this estuary of eleven miles in length, to be constructed of training walls of stone. These walls will have two serious effects,—they will fix or stereotype the channel, its wriggling motion and fretting action will be stopped, there will be nothing to stir up the sand deposited at the top of high water, and the result will be rapid accretion, and in the end reclamation. Then the direct action of the training walls will be here, as it has been everywhere else,—on the Seine, Lune, Ribble, &c.,—accretion; the walls arrest the tide, and the sand held in suspension is deposited.

The action I have described will undoubtedly take place; Mr. Stevenson, who has done more estuary work in all the other engineers together, says so. Mr. Eads, the great engineer of the Mississippi bar and estuary, says:—"It is not a matter of opinion, but of knowledge." The tidal capacity of the estuary will be gradually reduced, and as it is reduced our bar will shoal, and banks accumulate at our dock entrances."

We may add to this the following from a private letter of the manager of a Liverpool shipping firm, which we have permission to publish:—

"No sensible commercial man in our city is in the smallest degree moved by a fear that the construction of the canal would do any harm to Liverpool in a business sense. We know a great deal better than that. In the first place, steamers of any size would not go to the expense and risk of going up, when they might be discharging in the Liverpool Docks; and again, the effect, if it be ever made, which I still regard as doubtful, would probably be to the advantage of our port, as it would tend to a reduction or re-adjustment of port charges, by which cargo might be re-attracted here which is going to

other places, such as Fleetwood, where dues and charges are lighter. I look upon the scheme as an engineering enterprise, and have no hesitation in saying that the dividend which the promoters will obtain powers to pay the shareholders on the subscribed capital during the progress of the works, and the 'five to eight years' will be the only dividend they will ever get out of it. What we object to is the risk to the estuary of the Mersey by the proposed works. We are decidedly in danger of damaging our deep-water channel by the process they contemplate. You may or may not know that there is now 4 ft. less water on the bar than seventeen years ago, so that with our steamers getting larger and deeper—this is clearly no time for running any risk of cutting the scour over the bar. Moreover, take Bristol as an example; the Avon is, at least, as good and navigable as any Manchester ship canal they can make, and much shorter, and yet they are extending the dock works at the mouth of the Avon to avoid having to navigate the river, and bringing goods up by train."

Once more, is it logical to compare the proposed Manchester scheme with the Suez Canal? The Suez Canal is only (let us say) halfway between here and Bombay. Goods going out or coming home from the latter place would be 90 to 100 days by sailing vessel, and some 50 or 60 at least by steamer; via the Canal they go in 25 to 30, a very vast difference. Arrived at that point of the voyage, only half the journey has been accomplished; arrived in Liverpool for Manchester, the goods are practically at home, and a decent competition will gradually reduce the forwarding on to a proper level, without expending 5,000,000 in making a canal up which but few large steamers would care to go! One Manchester paper alone had the sense to look at the estuary question, and show that the damage to the Liverpool bar would be a far greater injury to Manchester than the canal could be a boon."

HEALTH EXHIBITION CONFERENCES.

THE DWELLINGS OF THE POOR.

The second* of the series of Conferences on the above subject under the auspices of the Mansion House Council was held on Thursday, the 5th inst., at the International Health Exhibition. The Archbishop of Canterbury presided.

Mr. James Hole read a paper on "Suburban Dwellings and Cheap Railway Fares." He stated that the increase of the metropolitan population was about 50,000 annually, and that all the efforts of benevolence in the past twenty years would not provide the accommodation sufficient for one year's increase. The exigencies of space only permitted of the block system for the growth of the population. A better solution of the question was the single dwelling outside London, where the tenant could have a few yards of garden, and cultivate the home feeling such as he could not experience in buildings constructed with the aspect of a barrack or workhouse.

In these the sense of comfort and beauty was ignored, and a city composed of a large aggregation of such buildings would be a mournful spectacle indeed. Mr. Hole next referred to what had been done by the Artisans', Labourers', and General Dwellings Company, and especially at Noel Park, near Hornsey, where the rentals ranged from 6s. to 11s. 6d. per week. One great benefit to the poor was that, on the estates of this company, public-houses were not permitted. What was being done by this company should be done all round London in connexion with the main lines of communication, but differing on the following points from the methods of the Artisans' Dwellings Company (Limited). To meet the growth of population, model villages should be created around the circumference of the metropolis. To do this the land should be secured before it was too late; power being given to take it at a fair valuation. Secondly, the railways should be induced to afford adequate facilities at reasonable rates. The so-called workmen's trains did not meet the necessities of the case, and were not convenient for the railway companies themselves. To save the companies trouble, the ticket might be combined with the rent. The third and most important difference was that the dwellers in these model villages should be encouraged to become the owners of their own dwellings. The Artisans' Dwellings Company had abandoned this part of their scheme, and had now become simply an investment for capital. To carry out his suggestions he proposed the creation of a paid Government Dwellings Trust, with the necessary powers to carry out working-class model towns, the funds of which should be derived in the first place from the issue of debentures; secondly, by the con-

* For a report of the first Conference see last week's *Builder*, p. 819.

tributions of the working classes in the repayment of the mortgage; and, lastly, if these were not found adequate, by a loan from the Government.

Miss Lidgett next read a paper on "The Treatment of the London Poor." The writer spoke from experience of the dreadful condition of the dwellings of the poor and of the almost hopeless task of improving them. To any one trying to grapple with this state of things a striking feature was the want of hope to all who were most immediately concerned. The landlord who had unfortunately invested in this low class of property complained that if he repaired anything it was soon ill-used and broken, while the sanitary inspector seemed to have lost all sense both of sight and smell, which he only recovered on finding an improving landlord, on whom he duly served his notices. All the way round they seemed to be entangled in a system of broken contracts. Miss Lidgett then referred to the labours of Mr. Ruskin and Miss Octavia Hill to improve the dwellings of the poor, to the efforts made to teach the people how to keep them clean, and how to pay for them honestly. This was not a mere matter of bricks and mortar, of plaster and whitewash, that could be ordered or inspected by public authority, but was a work, especially in the matter of rent-collecting, that for the most part should be done by ladies. In the future she hoped that dwellings for large numbers of people would be so constructed as to remove some of the special occasions of evil common in tenement houses, and that they would be kept at such an average standard of decency as not to require continued setting in order. When a court had once become a home of lawlessness nothing short of the efforts she had indicated would reclaim it, and nothing remained but to pull it down and scatter the inhabitants, who could not even then be received into improved dwellings. Many must fall out of the ranks, and strong hands were required to help them to their place again.

Mr. H. D. Harrod read the third paper, on "The Creation of a Building Fund." All the very excellent work of the Sanitary Aid Committees and kindred societies and workers, could at best be looked upon as a mere partial effort to meet the exigencies of the case. The question must ultimately be dealt with in a systematic and comprehensive manner. There were commercial and philanthropic sides to the problem, which it was desirable to keep apart, for though they had been successfully united by Miss Octavia Hill, he had great doubt as to their harmonious blending on a large scale. A commercial company was hampered by its desire to make a dividend, and a large Public Trust was preferable in many ways. According to Mr. Shaw Lefevre's figures, taken as a basis, land purchased by arbitration without the compensation given under the Lands Clauses Act would cost 8s. per foot or 17,424s. per acre. Dealing with 42 acres, of which one-half would be covered, the other half being left for roads and open spaces, the cost would be about 2,500,000l. The rents charged should be 2s. 6d. per room, or 4s. for two, and on this basis the income would amount to 148,512l. Allowing two-fifths for expenses and repairs, the net income would be 89,108l., or sufficient to pay 4 per cent. on nearly the whole capital, and leaving only a small outlay to be made from the Trust Funds. If the State would lend half the amount required at 3 or 3½ per cent., there would be no difficulty. A scheme, such as he had indicated, would provide for 47,140 persons, or about double the number provided for by the Artisans' Dwellings Companies. The clearances would be effected and the buildings erected gradually, and it would be the aim of the trustees to provide evicted tenants with immediate accommodation. All the houses would undoubtedly have to be rebuilt sooner or later, and the sooner the better. He had no desire to see the Trust swamping private enterprise in the same direction, and some of the funds might be profitably employed in assisting private individuals or small companies at a moderate rate of interest.

The Archbishop of Canterbury, in opening the discussion, said that every day showed public attention was being directed to a matter to which many earnest labourers had been trying to call attention for the last forty years. He felt sure that some great good would result from the present agitation. Long ages ago the idea of a Greek or Roman city was that it should be compactly built, with very little knowledge indeed of sanitation, but with the proviso that

all round about the walls there should be a great area of common land. It was too much to hope for great rings of land around the villages and towns of England, but the heirs of those to whom lands belonged might put the people in possession of things which were quite as good. The old city of Vienna at the present day had around it a great stretch of green meadow lands, beyond which the modern city had been compelled to establish itself. Something approaching that, on a gigantic scale, would be the great centre of London, circled by towns built with some idea of sanitation, and surrounded by their own common lands. It had been well suggested that great things might be done by enabling the working classes to become the owners of their houses, but they knew as a practical people that such could never completely be the case. It was not good for human beings to be in the hands of the middleman. He was not so chimerical as to wish to see the whole of the land inhabited by the poor covered by model blocks. The artisans did not like living in these large buildings, preferring rather houses or cottages which could be made habitable. The poor liked to make their own homes, and the English people, above all others, liked to show character in everything about them. All honour was due to those who in the first instance had attempted to deal with the subject.

The Rev. R. C. Billing (Vicar of Spitalfields), hoped none would be misled by the statistics published as to the accommodation provided for the poor who were displaced by so-called improvements. He would like to see a legal definition of over-crowding, and he contended that a certain amount of cubic feet of air should be allowed to every human being in the metropolis. All houses let out in tenements should be under inspection.

Rev. G. S. Reaney considered that the law, as regarded sanitation, should be much more stringent. Neither private enterprise, which had led to the present state of things, nor benevolence, was able to cope with the difficulty; what was required was Government interference.

Rev. H. Solly mentioned that the open space in the centre of Shaftesbury Park had been built over because the enterprise looked to its five per cent. rather than to philanthropy. He did not think the question would be solved by the workmen going to a great distance from their work; the work should rather follow the workmen.

Mr. A. Parker, Mr. Cooper, and others, addressed the meeting, and the Conference adjourned.

DIFFICULTIES OF SANITARY ADMINISTRATION IN THE METROPOLIS.

The Conference resumed its sitting on Friday, the 6th inst., when the chair was occupied by Cardinal Manning.

Mr. Shirley F. Murphy, M.R.C.S., Medical Officer of Health of St. Pancras, read a paper entitled "Some Difficulties of Sanitary Administration in the Metropolis." He referred to the small share that a consideration for health had in the London Government of the present day. In some parts of the metropolis people were still dying nearly at the rate at which people died in the large towns a century ago. Recognising this fact, then, was it too much to ask that thought for health should be one of their chief considerations? With regard to over-crowding, up to the present time the thought that had controlled the arrangement of houses upon a site was chiefly the convenience of the traffic rather than the health requirements of the inhabitants. It was not until 1855 that London insisted upon the preservation of any open space at the back or side of the houses, while it was not till 1862 that the height of a building was held to have any relation to the need for ventilation, and even then only to buildings about to be erected in new streets of less than 50 ft. in width. To existing streets this did not apply, and high unventilated houses were permitted on all sides. Much difficulty had arisen from an imperfect recognition of the fact that the manner of construction of the house affected the health of the inhabitants. No adequate provision was made for those who were unable to afford the means of occupying a whole house. Even where houses were specially provided for the poor, they could not always claim to meet the requirements of health, and the so-called model lodging-houses,

he believed, would be condemned by a more enlightened public opinion. London had no Sanitary Authorities to deal with such questions. At present they appeared to exist rather for the removal of nuisances than for the prevention of disease. The difficulties of District Boards were often very great in dealing even with matters over which they were entitled to exercise complete control. London was already many years behind several towns in respect to house drainage, although as far back as 1855 the District Boards had full powers to insist upon the drains being made "in such direction, manner, and form, and of such materials and workmanship, and with such branches thereto, and other connected works and apparatus and water-supply as the Board should order." In practice it became almost impossible to insist upon one kind of apparatus on one side of a street, which was, perhaps, in another district. It was natural that any one authority, before modifying its procedure, should ascertain what its neighbours were doing, and it was evident that at the time it would find them taking no action in the matter. The authority therefore, finding its position would be exceptional, declined to proceed further. He left them to judge how much probability there was of the thirty-nine different authorities in the metropolis departing from the various methods of their own creation, and adopting a uniform and improved practice. The fault was not that of the local authorities, but of a system, and nothing but the alteration of that system would remedy the evil. At the present time no sanitary administration deserving the name could be said to exist in the greatest city in the world. The local sanitary authorities had no jurisdiction over many subjects of vital importance to the public health, and the authorities upon whom these duties devolved were not primarily concerned in the prevention of disease. Surely it was time that London, with her vast population, should demand a sanitary administration worthy of herself.

Mr. B. A. Whitelegge, M.D., read a paper on the same subject, in the course of which he said that in the laws bearing upon sanitation in the metropolis there were many important omissions. At the same time it was none the less incumbent upon the authorities to exercise the powers conferred upon them, many of the present evils being attributable to their neglect in doing so. There should be repeated inspection of tenement houses, and it was absurd to allot to one man a district with a population of 50,000 or 60,000 people. The sanitary authority had vested in it the responsibility of taking the initiative in active measures, but in many instances it was reluctant to do so. Much might be done by individual and collective action in the way of organising public opinion. The poor should be educated as to the importance of healthy houses and surroundings. The attention of the authorities should also be directed to all unhealthy conditions which could be found, and the evils carefully remedied. The thirty committees in connexion with the Mansion House Council had inquired into over 500 cases, the utmost secrecy being observed as to the quarters from which information was received.

SUGGESTIONS TO THE ROYAL COMMISSION.

Mr. C. M. Sawell read a third paper, entitled "Suggestions to the Royal Commission on the Dwellings of the Poor." This paper extended far beyond the time allowed, and was towards the end received with some impatience. He suggested that no immediate transformation in the condition of the poor could be expected, their character needing improvement in the first instance. The housing of the poor he considered had become a practical monopoly, and exorbitant rents were charged for the vilest accommodation. The system of leases had a tendency to accentuate the evils complained of, and he suggested that Draconic powers should be given to municipalities to acquire property without having to pay any excessive compensation. Mr. Sawell then dealt generally with several matters, such as the licensing laws, the inspection of lodging-houses, Government loans to assist reconstruction, and reduced rates on improved dwellings.

Dr. Godfrey explained a scheme with which he was connected for enabling workmen to purchase their own houses out of rent. He contended that his system would allow the labouring man to put his finger into the money ring, and to turn his industry to the best account.

Dr. A. Carpenter (St. Thomas's Hospital)

referred to the antagonism existing between local self-government and centralisation. It was a mistake to trust too much to detail in connexion with sanitary or legislative matters; and the great thing was to get the people educated to such a level that they might see what was necessary to be done. It was a mistake to expect Parliament to do everything. Rev. Mr. Hillocks entered upon the subject of the treatment of the London poor.

Rev. George M. Murphy (London School Board) thought it would be well if the Mansion-House Committee would convene a meeting of *bona-fide* working men and hear what their view was on this question. In all he had heard to-day it would almost seem as if no building societies were in existence. He believed there was no hope of any practical good being done for the working people unless it were done through themselves.

Mr. Hunter, a working man, here remarked, that although the class he represented desired the help and sympathy of the well-to-do, they would not be treated as mere machines. The working classes could teach the better classes a good deal on the subject of building societies, having solved the problem for themselves.

The Rev. Septimus Buss (vicar of Shore-ditch) considered that the law had full power even in its present condition, to deal efficiently with sanitary matters. The building of houses should be supervised by some new department of State, which might be made self-supporting.

Rev. G. W. McCree thought the condition of the poor would not be much improved unless the independence of the Sanitary Inspector were indicated. One restry with which he was acquainted contained sixteen publicans and sixteen house-farmers. Such men should not be the superiors of the Sanitary Inspector, and should have no power to remove him for doing his duty.

The Chairman (Cardinal Manning) said that Dr. Goddard's scheme seemed to be somewhat similar to a scheme of Labourers' Dwellings in Leeds, which had been in operation for forty years. This scheme had created 7,000 freehold houses, now held by workmen. When he saw a large number of working men intent on becoming freeholders he cordially supported their efforts. The large blocks erected of late years had not housed the poorer of the artisan classes and unskilled labourers, while they had housed the better class of artisans and even clerks. There was only one block he knew of, and that on the other side of the river, which the poor working man could enter. He had given long attention to this question, but he confessed that the more he studied it, the more he found difficulties which checked present action. The Mansion House Council was working on excellent lines. It had been stated that Royal Commissioners were to offer "shelves," and he could only hope that the present one might not come under that category. The Commissioners might draw up a report which would satisfy contending interests, but legislative action was also necessary. The people must not be slack, and if public spirit were brought into play there would be found a dynamic force which would put the statutes into operation.

Rev. Mark Wilks proposed, and Mr. J. Hamer seconded, a vote of thanks to the Chairman, and the meeting terminated.

DOMESTIC SANITARY ARRANGEMENTS OF THE METROPOLITAN POOR.

The first of another series of conferences, organised by a committee appointed by the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, was held on Monday afternoon in the Conference Room at the International Health Exhibition. Dr. T. Orme Dufield, president of the first-mentioned Society, occupied the chair, and having explained the origin of the Conference and the arrangements for the week, called on

Dr. Tripe, who read a paper on "The Domestic Sanitary Arrangements of the London Poor." After some introductory remarks, Dr. Tripe said the most important of the sanitary arrangements of the poor was the water supply and water-supply apparatus. In some London parishes the supply was almost entirely derived from what was called the constant service, such as that of the East London Waterworks Company, whilst in others only a comparatively small proportion was so given. A constant was much preferable to an intermittent supply, as by a trifling alteration of the pipes water could

be drawn from the main instead of from a cistern. In many poor houses there was not a cistern when the supply was constant. He strongly urged the necessity of a cistern in all cases. He found that the best way of obtaining a supply of good water was to have a length of pipe connected with the supply-pipe before it reached the cistern, with a screw-down tap placed over the sink, so that water could then be drawn from the main instead of from the cistern. This arrangement had been extensively carried out in the Hackney district amongst the poor. It was much to be regretted that the power of the vestries and district Boards of the metropolis were not sufficient to enforce a proper water supply for drinking and domestic purposes, as well as for flushing closets. Power should be given to compel owners to disassociate the drinking-water from that used for other purposes. When the water-supply was on the constant system this could be done at a trifling expense, and when it was not on the constant system, by the intervention of a flushing-box between the cistern and the closet. This was not, however, sufficient, as the cistern was often placed in or above the closet, forming part of its roof, a most objectionable arrangement, as the cistern could not be readily cleaned out, and was exposed to frost; and if there were not a water-closet service-box or flushing-cistern the water might be contaminated by effluvia from the pan, which was often very dirty. When an intermittent was changed to a constant supply the size of the ferrule in the main, which was usually very small, should be increased so as to admit of a full flow of water being obtained from the draw-off tap as quickly as could be done under the old system from the cistern. The direct connexion so often found to exist between the sink-waste and the house-drain was most injurious, as when the cover of the bell-trap was left off or broken a current of sewer-gas could, and often did, pass into the room. He scarcely knew of a greater source of discomfort from such sink-wastes. The heads of the rainwater-pipes were, especially in poor houses, often placed near windows, so that sewer-gas could make its way into bed and living rooms without being suspected. Diphtheria, often fatal, occurred apparently from this cause, and he had met with typhoid fever in rooms so situated. He was in the habit of having rainwater-pipes so placed cut off from the drains and made to discharge the rainwater over or into a yard-gully. The drains of the houses occupied by the poor, especially when the houses were old, were very often structurally defective, being often made of bricks with open joints, from which sewer-gas and rats could escape. A very objectionable, but also a very common, plan was for several houses to be drained through an outlet common to many houses, to save carrying the drain under houses. With regard to brick drains under or near houses, he held a strong opinion as to the necessity of pipe-drains being substituted for them. Dust-bins were very often—indeed usually—a source of discomfort and he believed sometimes of disease. The best kind of dust-bin with which he was acquainted was made of iron one-twelfth of an inch thick, well riveted together, with strong hinges to the lid, and without a bottom, so that the bin could be lifted off and the dust, &c., be easily removed. These bins, which would hold about a fortnight's dust, &c., for a small house, were by no means costly, and they were not easily destroyed or injured. The arrangements for the removal of dust and house refuse were generally deficient.

THE IMPROVEMENT OF THE SANITARY ARRANGEMENTS OF METROPOLITAN HOUSES.

Mr. Ernest Turner, F.R.I.B.A., in commencing his paper on this subject, said he was afraid that in dealing with the matter of house-room for the poor they did not always formulate with sufficient accuracy their notions of the class for whom they were catering. Hence the work which had been so far done in that direction, excellent as it was, had not really had much practical bearing on that particular problem. The artisan had had his accommodation immensely improved, but the artisan was not, unless by aid of the gin-bottle he took pains to make himself so, what could properly be called poor. The real problem before them was the sanitary housing, not of the artisan, but of the labourer. The labourer and his family had to live in one room, and it was no use endeavouring to persuade either him or themselves that he

could or would occupy more. From 3s. 6d. to 4s. a week was all he could pay, and more than he could afford, and for that amount not more than one room was to be had. Certainly what were known as common lodging-houses were in these days of systematic inspection by far the most sanitary of any dwellings of the poor. It might be a question, too, how far the serious prejudice which undoubtedly existed in the minds of the poor against the huge new blocks of model buildings might not, sooner or later, wear out, as the kindred prejudice against what were known as "flats" had already pretty nearly worn out among the wealthy classes. But, be that as it might, there could be no question as to the pure and unadulterated idiocy of the plan upon which the British labourers' lath-and-plaster castle was at present arranged. It never seemed to occur to any one who built a street of houses to construct them on any other plan than such as he would adopt were each house to be occupied by a single family, although he knew perfectly well that every house would be occupied and was intended by himself to be occupied, by nearly as many different families as it contained rooms. At least, one would think, these tenements might be built double-fronted, so that one passage might serve for two. In a street of houses there would in this manner be effected a trifling saving of, say 200 ft. of frontage. That was to say, a space sufficient to build about a dozen houses more, or rather not to build them, for no more bricks, mortar, or labour would be required than at present. He would perhaps be told that this would be no advantage to the labourer-tenant, but only to the landlord. But this would be a mistaken view. The great difficulty for the poor man was cost; the great factor in cost was shortness of space. The man who could make five houses where there were only four previously, conferred as great a boon on the houseless as was conferred on the hungry by him who worked a similar increase with ears of corn. Another excellent economy was that of putting the wash-house on the top, which both saved space and conduced to dryness, ventilation, and other sanitary desiderata. Mr. Turner then drew attention to a set of plans of what he described as a really admirable block of buildings, recently erected at Westminster by a most uncharacteristic member of a class too generally known as the common enemy of mankind, the "speculative builder." These blocks were admirably planned, substantially built, and thoroughly "sanitized" throughout. The partitions were solid, the skirtings of cement, the floors and staircases fire-proof, the waste-pipes disconnected from the drains, the soil-pipe outside the building and thoroughly ventilated, the drains properly laid, with access and disconnecting chambers; and they were paying more than 7 per cent. Now of all the odd things that they would think of applying for the purpose of developing fire-proof qualities, perhaps the oddest would seem to be sulphur. But it was a chemical, scientific, and practical fact that Portland cement, when mixed with a certain proportion of sulphur, would stand both fire and water to any reasonable extent without turning a hair. Another excellent plan for obviating the danger of fire arising from the use of laths, was that patented by Mr. Hitchens, and which consisted of plaster screwed up in slabs and faced with a setting-coat. The whole front of the pair of sanitary and insanitary houses shown at the present exhibition, was constructed in this way. Having enumerated a long list of defects to be found in any house not built within the last twenty years, Mr. Turner said, it was a delusion to suppose that if once they began to meddle with an old house they would end in bringing it about their ears altogether. An old house was often better built than a new one. One thing, at all events, they could always do; they could always "disconnect" the drains, and in doing it they would cut off the chief danger to health at the cost of a very few pounds. All waste-pipes should be arranged to discharge in the open air. The old-fashioned and poisonous fittings could be exchanged for modern appliances; soil-pipes could be ventilated by carrying them up to the roof; and cisterns removed to an accessible position, properly covered, systematically cleaned, and cut off from communication with drains, and so forth. Even the aesthetic side of the question need not be altogether neglected.

Mr. Rogers Field agreed with Dr. Tripe that

the cistern should always be placed where it was accessible to the householder; that should be insisted upon by the tenant. As regarded flushing, he suggested that there should be an arrangement by which the operation could be performed at one touch. He went further than Mr. Turner, for he believed that the numerous defects he had mentioned might be found in houses built ten years ago. In London, building was going on at the rate of twenty houses per day, and the question was whether they were being built with those defects. In the thirty-nine sanitary districts into which London was divided there were no proper sanitary arrangements, or if they existed they were not enforced. Stringent by-laws like those which were carried out by Local Boards in the country were required.

Professor Corfield expressed his perfect concurrence in the views set forth in the two papers which had been read. As regarded the dust question, it was the duty of the sanitary authorities to remove the dust and refuse from the bins, and that was the only way in which it could be effectually collected.

Dr. Carpenter observed that continuous and regular inspection was required in order to see that proper sanitary arrangements were carried out. The dust should be removed by the local authority. He suggested that it would be far cheaper and better for the public health if the 500,000 fires used in London for cooking purposes were got rid of, and gas substituted. He would advise all those interested in this work to pay a visit to the Parkes Museum.

Dr. Bartlett said he found a difficulty in getting rid of the dust at his house near Grosvenor-square, so that they would understand the position of the poor. As regarded their dwellings, the poor required lodging in commodious houses at rents they could pay, from 2s. to 2s. 6d. per week.

Mr. Robins remarked that the two men who passed examinations on sanitary requirements most successfully came from Mr. Waterhouse's offices. What was required was for medical men of high standing to state the principles, and the architects would then take care that the buildings were erected with a due regard to sanitary conditions.

Captain Douglas Galton was of opinion that the difficulty of getting dust and refuse removed, and of the circulation of pure air, was the cause of much of the disease in the densely-populated portion of London. There was nothing so necessary to insure sanitary progress as the education of the people in sanitary matters.

Dr. Bernays remarked that the impurity of the water was to be attributed to the bad condition of the cisterns. They ought to be thankful they had such a good water supply in London.

Mr. John Slater observed that it was utterly impossible to carry out the best system of drainage in London; but they must do the best possible under the circumstances. It was necessary in many cases to carry the drain-pipes under the houses, but these pipes could be made innocuous.

After some remarks from Mr. T. Manson, Dr. Morgan, Mr. T. Blashall, and Mr. Liggins,

The Chairman briefly summed up the discussion, observing that there were latent sanitary powers existing which should be brought into play by the authorities.

The proceedings terminated with a vote of thanks to the Chairman.

A report of Tuesday's Conference will be found in our Supplement.

ASSOCIATION OF PUBLIC SANITARY INSPECTORS. ANNUAL DINNER.

THE first annual dinner of this Association was held in the Venetian Saloon of the Holborn Restaurant on Saturday evening last, Mr. Edwin Chadwick, C.B., President of the Association, in the chair, supported by a large number of the members and friends of the Association.

The Chairman, in proposing the health of "The Queen," referred to the example set by Her Majesty to the rest of her subjects in regard to matters which the Association had at heart. One of the first things Her Majesty did, as soon as the affairs of state permitted, was to direct a close sanitary inspection of all the cottages on her own estate at Osborne, and that any action which might be shown to be necessary should

be taken. As a result it was found that there was a sickness and death-rate by one-third less than the death-rate prevalent elsewhere. From that result he was able to declare that if Her Majesty's example were generally followed it would be for her subjects of the wage-classes as if there were a jubilee,—no sickness and no deaths,—every third year.

In proposing the next toast, "His Royal Highness the Prince of Wales and the rest of the Royal Family," the Chairman noted with regret how largely the Royal Family had suffered by diseases which sanitarians knew to be preventable. In his interest in sanitation H.R.H. the Prince of Wales was a true son of his great father, the illustrious Prince Consort, whose prominent and sole contribution for the attention of nations at the first International Exhibition was a model cottage, of accepted principles of construction, some of which, particularly as regarded damp-proof and washable walls, had yet to be realised in practice. At Sandringham the Prince of Wales had set the distinguished example of renewing all the cottages on his estate, and had taken care to see that all the cottagers were provided with an ample supply of pure, soft water. The Prince of Wales had also been the foremost to support the Commission of Inquiry into the condition of the houses of the poor, the result of whose labours would, it was to be hoped, take effect in practical sanitary measures.

In proposing "The Army, Navy, and Volunteers," the Chairman took occasion to note what sanitation had done for the army, and how much more might yet be done for it by the same beneficent agency. Heretofore, whilst the losses by the sword had been as 1, the losses by disease,—for the most part preventable,—had been as 3. By the work of the Army Sanitary Commission the death-rate of the home army had been reduced from 18 to 8 per thousand, and, by that diminution upwards of 4,000 beds in army hospitals, which would have been necessary under the old conditions of service, had been saved. The fact was that the Herbert Hospital, which was constructed on the scale of the old death and sickness rate, had been half-emptied. On the loss of our first army in the Crimea, owing to the break-down of the curative service and to the entire absence there of a specially organised sanitary service, he (the Chairman), by the help of Lord Shaftesbury, induced Lord Palmerston to send out a special as one of their staff, a sanitary inspector who had done much good work in Liverpool, and who took with him competent assistants. The result of the sanitary service of that Commission was that our second Crimean army was declared by the Minister of War to have been brought back in a better state of health than it had ever enjoyed at home. By the writing of papers and by personal representations he (the Chairman) had succeeded in getting some (though only rudimentary) provision made for the application of the sanitary experiences in the Crimea to the protection of the army in India. The old death-rate there was 67 in 1,000, but this had been very materially reduced, so that during the last decade there had been a saving of 40,000 of force in sickness and deaths, and more than five millions in money. But, as they know, the saving in force and money might be largely augmented at home and in India, and grounds might be shown for Parliamentary action for the maintenance as well as the advancement of sanitary science, with a reflex effect for the protection of the civil as well as the military population. Germany,—probably at the instance of the Crown Prince and Princess,—had been in advance of our administration in availing itself of the experience of sanitary science gained in the Crimea, for whilst our administration lagged at eight in a thousand, Germany had reduced its army death-rate to three in a thousand, as against France,—still more lagged in sanitation,—which had a death-rate of 10 in a thousand. Germany, with its army of 1,800,000 men saved, by its attention to sanitation, some 18,000 deaths every year. If we took the German army at 1,000,000 in time of peace, this attention to sanitation saved, beyond our lagged rate of 8 per thousand, 14,000 beds, or the contents of about twenty-two Herbert Hospitals. Or, against the higher French death-rate of 10 in a thousand, it saved about 24,000 beds, about equivalent to the provision of twenty-six hospitals of the size of Netley. He dwelt on these examples of the application of sanitary principles to the aug-

mentation of military force and economy, as they might serve to indicate the possible future of their application under good administration to the civil community. As to the Royal Navy, it, with its death-rate of 44 in a thousand from sickness, was in advance of the Army, but it had more yet to do. Dr. Johnson characterised a ship as a prison, with the addition of the danger of being drowned. He (the chairman) saw no reason why the death-rate of the Royal Navy should not be brought up to the death-rate of a prison, viz., to 3 in 1,000. In view of these actualities and possibilities, it was not pleasant to contemplate the death-rate of the commercial marine,—18 in 1,000,—and a double death-rate from disease, including scurvy, for want of proper sanitary inspection. In conclusion, he begged to couple with the toast the name of Captain Douglas Galton, whose services in the cause of army and general hygiene were well known.

Captain Douglas Galton, in responding, said that one reason why all Englishmen were so appreciative of the services of the Army and Navy, was that they knew that during war those forces were engaged in a perpetual struggle against difficulties. And that was the reason why we appreciated the deeds performed by that ante-type of General Gordon, the Chevalier Bayard. But there were other chivalrous struggles, besides those of armed warfare, going on daily. There were struggles against disease, struggles against mortality, which were being carried on by an army of sanitary inspectors,—men who had the welfare of the country at heart as much as the soldiers, and who certainly did quite as much for the good of the country.

Dr. B. W. Richardson, F.R.S., in an eloquent speech, proposed "The Association," the formation of which was, he said, the natural outcome of a felt want,—an absolute necessity,—and all old sanitarians welcomed its advent and had great hopes for its future. The Association was likely to become a great national institution, if the members were true to themselves, and to the duties they were called upon to perform. Their work necessitated some knowledge of a wide range of scientific principles. To do it well they must be, to some extent, chemists, mechanics, physiologists, and statisticians. If they as a body performed their work well their services would be welcomed by the medical profession, without any feeling of jealousy. The Association was to be congratulated in having the wisdom to ask their chairman of that evening to become their President, and they were still more to be congratulated on their good fortune in having obtained his services, for Mr. Chadwick was undoubtedly the greatest sanitarian of this or any other time. Although he was now eighty-four years of age, there he was presiding over them and encouraging them in their good work of conserving the health of the people. In eloquent terms Dr. Richardson briefly passed in review the principal services which Mr. Chadwick had rendered to the community, more especially in connexion with the cause of sanitation, during an active career extending over nearly sixty years. His Report upon the Condition of the Labouring Classes formed a standard volume, without studying which no one could claim to properly understand the subject. Though his name and the services he had rendered could never be forgotten, his services had certainly not received the recognition they merited in high quarters. Surely when honours were plentifully poured out on those whose services had involved the destruction of life, they were entitled to expect that the services of those who were the conservers of life should be, at least occasionally, considered and rewarded by due recognition. In conclusion, Dr. Richardson coupled with the toast the name of the President. The toast was enthusiastically received.

Mr. Chadwick, in reply, thanked Dr. Richardson for his appreciative words, and the assembly for the way in which they had received the toast. He said he quoted with satisfaction the declaration made a short time since (after years of delay and obscurity) by the leading journal,—which especially studied and followed public opinion,—viz., that "Sanitary science is the glory of modern times. It is the favourite pursuit of the present day. None is felt to be more needed and is more neglected for all practical purposes. Former generations perished in venial ignorance of all sanitary laws." Now, to retrieve that neglect one of the first steps to be taken was to show the cost of preventable

disease, and the economy resulting from the adoption of sanitary measures. Taking the case of the metropolis, he confidently estimated from what had been done by sanitation in other urban districts, and from what had been done by the same agency in some parts of London itself,—that by the adoption of proper means a reduction might be made in the present death-rate to the extent of five in the thousand. That would effect a saving, for the four millions of the inner ring of the population, of about 20,000 lives annually, and a saving in money (now spent in funerals and lost by inability to work through sickness) of 700,000*l.* per annum. This sum capitalised at thirty years' purchase would give 21,000,000*l.*, or 50*l.* per house,—enough, under a competent administration, to pay for the execution of the chief primary works required for the prevention of disease. All over the kingdom, the losses from preventable disease under the heads stated were not less than 25,000,000*l.* per annum, or three times the amount of the poor-rates. During the last decade, as the Registrar-General had shown, there had been an important reduction of the death-rate, and a saving of nearly 400,000 lives, which must have been attended by a saving of upwards of four millions of money in England and Wales, and that saving must have been in great part due to the services of the 1,700 inspectors. Of the great body of those inspectors, he was able to state that they were desirous of securities being taken for the maintenance of the efficiency and respectability of the service. It was due to them that they should all be placed in the position now accorded to the majority of the officers under the Local Government Board,—viz., that their continuance in office should be permanent during good behaviour, and that they should not be subject to removal at the hands of those members of local authorities whose private interests as property-owners were likely to be affected by the conscientious work of a competent sanitary inspector.

Mr. William Rains, vice-chairman of the Council, proposed "The Visitors," coupled with the names of Sir Richard Owen, K.C.B., and Dr. Alfred Carpenter.

Sir Richard Owen, in the course of an interesting speech, gave some personal reminiscences of his work as a sanitarian forty years ago,—work to which he said he was introduced by their president,—more particularly in connexion with the town of Lancaster. As one result of the work in which he and other gentlemen had interested themselves at that time, Lancaster had received a good supply of soft water, supplied by gravitation, in lieu of the hard water previously obtained by pumping, and the health of the town had been improved. The engineer for those works was a gentleman well known as a sanitarian, viz., Sir Robert Rawlinson.

Dr. Carpenter expressed his high appreciation of the work of the sanitary inspectors, and dwelt on some of the ways in which their work was hindered by members of local authorities. The earnest discharge of their duties must be its own reward, for they would receive little thanks from those for whom they laboured. That this was so was plain from the fact that their president was still Mr. Chadwick.

Lord Fortescue, who was also called upon to respond for the visitors, referred to Mr. Chadwick's labours in the cause of sanitary reform, remarking that anything which he (the speaker) might have been able to do in connexion with sanitary legislation was due to the advice and help of Mr. Chadwick.

Mr. E. C. Robins, in a few well-chosen words, proposed "The Executive," on whose behalf Mr. George B. Jerram, chairman of the Council, and Mr. S. C. Legg, hon. sec., replied, Mr. Jerram stating that although the Association had been in existence for barely a twelvemonth, it already numbered 230 members, composed of metropolitan inspectors and urban and rural inspectors in all parts of the country.

Mr. Jerram proposed "The Press," thanking it for the services which it had rendered to the Association, and coupling with the toast the name of the representative of the *Builder*, who in responding incidentally referred, amidst much applause, to the services which had been rendered to the cause of sanitary progress for a period of nearly forty years by the late editor of this journal, Mr. George Godwin, now one of the Royal Commission on the Housing of the Poor.

The only remaining toast was "The Ladies," proposed in felicitous terms by Dr. Richardson.

THE ENLARGEMENT OF THE EXCHANGE AT HAMBURG.

This work is now approaching completion, and according to the local press, the new part of the building will be opened for public use as soon as the dividing walls are broken through which separate it from the older portion of the edifice. The enlargement was decided upon by the municipality on April 20th, 1881, after the Commission entrusted with the examination of the plans had selected those of Messrs. Hansen & Meerwein, making a few alterations as to the width of the Exchange Room. After the Senate had confirmed these decisions, the execution of the work was placed in the hands of the above-mentioned architects.

The foundation was commenced on the 9th of July, and was completed by the end of the year, consisting of a concrete layer about 6 ft. 6 in. in depth. The excavations were difficult to carry out, and special interest attached to them from the fact that various portions of the old walls of Hamburg were brought to light during the progress of the work. During the year 1882 the building operations progressed to the stage of the ground-floor, being completed before frost set in. More progress would have been made, but that the sandstone was not delivered as rapidly as should have been the case. In the course of 1883 the exterior and a great part of the interior were finished.

The façades are similar to those of the old exchange, being in the Italian Renaissance style, and designed on the model of the Sansovino library at Venice. The material used was Oberkirchen sandstone, known for its weather-resisting properties; the quantity employed being about 50,000 cubic feet. The portals are ornamented with figures typical of industry, agriculture, mining, postal and telegraphic communication, &c., these sculptures having been entrusted to Herr E. Pfeiffer, of Hamburg.

On the ground-floor are the Exchange Room of about 12,000 square feet in size, the telegraph office, thirteen offices, lavatory, &c. It had originally been intended to have offices on the first floor, but this portion of the new building will now be occupied by the Chamber of Commerce. It is also in contemplation to devote a certain amount of space to an exhibition by local artists. In the basement there is, amongst other offices, a large restaurant. It is also projected to carry out some improvements in the exterior of the older portion of the building.

GERMAN SANDSTONE.

The *Cologne Gazette* calls attention to the increased development of the sandstone industry in the Eifel district, more particularly in the Kyllthal, between Cologne and Treves. The Kyllthal sandstone would seem to have gained a wide-spread reputation for grinding purposes, and in the Westphalian centres of the cutlery industry no other description is used. Belgium is almost exclusively supplied from this source, and quantities of a certain importance are sent to France, Switzerland, and Austria. There are about 1,000 persons occupied in the quarries of Kyllburg, Denborn, Neidenbach, and Philippsheim.

Since the opening of the railway from Cologne to Treves in 1871 the red sandstone of the Eifel district has been extensively used for building purposes; its employment in that manner by the Rhénish Railway Company having done much to facilitate its general adoption. In addition to other advantages, it is not affected by the weather, and preserves its beautiful red colour for many centuries. Thus the Foundation Church at Kyllburg is built of this material, and although the edifice dates from the commencement of the twelfth century, there is not a single stone affected, and the edges of the stonework of the spire are as sharp as when newly erected.

The sandstone for the eight armorial bears at the Berlin Rathhaus was delivered from Kyllburg in sixteen blocks, each of seven tons weight.

It is stated that one rock has now been laid free which is of more than 175,000 cubic feet in capacity.

ARTISTIC PROGRESS IN SWITZERLAND.

A MEETING of the Swiss Art Society was lately held at Zofingen, with the special purpose of discussing the establishment of an art gallery and college of art. After a careful examination the proposal was agreed to and the following general ideas were adopted for submission to the Federal Council in order to guide that body in the organisation of the scheme.

1. The Federal Art Exhibition should take place every three years. The annual contributions of the Federal Council in the intervening years (at least 4,000*l.*) should be applied to the artistic decoration of public buildings, the erection of national monuments, and the support of the exhibitions organised by the Swiss Art Society.

2. The exhibitions of the Swiss Art Society should be held in the same manner as hitherto, and an annual contribution of 600*l.* should be contributed by the Federal Council.

3. The Federal Exhibition or *Salon* should be held alternately in those cities which possess suitable accommodation and the necessary attendants, &c.

4. The choice of one-third of the members of the College of Art should be left to the Swiss Art Society.

"THE MYSTERIES OF COLOUR."

SIR,—Mr. Storey will not regret that my criticism afforded him an opportunity of adding an explanation which was necessary to the proper understanding of his views on the subject of the "primary" colours as considered from their artistic rather than the scientific aspect. I am unable, however, to accept his explanation as satisfactory. Pigments possess many properties besides those of colour, and which are not dependent on colour, and when mixed together they do not produce the uniform results which Mr. Storey's theory claims for them. Thus some blues and yellows produce pure greens, while others, quite as intense and beautiful, produce only olives or greys; and the same holds good of purples, resulting from the mixture of reds and blues. It is an error, therefore, to speak of yellow and blue (as mere colours) as producing green when we only mean that two substances, say a salt of lead (chrome yellow), and a salt of cobalt (ultramarine), when mixed together give off a green colour. The scientific explanation of this phenomenon is that the salt of lead absorbs the red and yellow rays, and the salt of cobalt the blue and violet rays of the spectrum, and thus the green rays are liberated and become visible. If the pigments were so intimately mixed as to produce a colour from the mere combination of their tints, the result would be grey (white), because, being complementary colours, they would neutralise each other, just as two rays of coloured light do. The media in which pigments are mixed, and many other conditions besides their varying powers of absorbing the colours of the spectrum, complicate the result, but all these conditions admit of scientific explanation on the Young theory of colours, and on no other. There is no subject of everyday knowledge on which such gross ignorance exists as on that of colours, and a "school of colour" devoted to the study of the science,—not the art,—of chromatics, and its bearing on the decorative arts in their hundred and one different forms, would be of a more useful and practical character, and more likely to receive support and encouragement from patrons and students than one of a technical kind suggested by Mr. Storey. . . . C. ROBERTS.

London Streets.—In the paper on "Wood Pavement in the Metropolis," by Mr. George H. Stayton, C.E., to which we referred last week, it is stated that the aggregate length of the streets of London is 1,966 miles, of which, excluding 248 miles in course of formation, 1,718 miles were thus maintained by various authorities, namely:—

	Miles.
Macadam	573
Granite	280
Wood	53
Asphalte	134
Flints or Gravel	768

The existing area of wood pavement is 980,533 square yards, and its estimated cost 600,000*l.* Not more than 4.38 per cent. was east of the city or south of the Thames.

THE NEW ADMIRALTY AND WAR OFFICES.

THE HORSE GUARDS STOP THE WAY.

SIR,—There has been some discussion in the *Builder* upon the subject of the designs for the new War Office and Admiralty. There is, however, something to be said upon the subject of the site, by the selection of which it would seem that a large sum of money is proposed to be spent in the purchase of property which is not required (at least at present) for the purpose, and which property now lets, or is worth a large annual sum. It is situated in Spring-gardens and Spring-gardens-terrace, and mews in the rear of both, and the Crown are the ground-landlords of most of it.

Between the proposed site and the Treasury Buildings (which may be called the Home Office block) there are Dover House and the Horse Guards. Why are not the new buildings commenced at the end of the present Government Offices, and these two properties included in the site? There would then, I think, be room (if wished) for a house for the First Lord of the Admiralty without touching Spring-gardens, and the line of Government Offices would be continuous. A reference to the Office of Works map will show the frontages to Whitehall and the Park.

It was said when the site was proposed that it was not intended to touch the Horse Guards. Why not? That edifice is not ancient, and it is not handsome, and it is not necessary for the safety of the British Constitution that the two Horse Guards should sit on horseback in their boxes facing Whitehall from ten till four (or thereabouts) daily, and it seems a strange thing that they should stop a great public improvement. But so it appears to be, as their rooms and stables occupy a great portion of the Horse Guards site. They could, however, mount guard as before, but on foot, as they do at the St. James's Park side. Buckingham Palace or St. James's Palace would be fitting places for their mounting guard on horseback, if thought to be absolutely necessary; but this, perhaps, might be dispensed with altogether.

The Horse Guards site could be built upon, and still called the Horse Guards, and the War Office could be part of it. The view of the parade-ground and the drive through could exist all the same, but the buildings overlooking the Park would be as high as the Home Office block, and the large space now uncovered, or covered with stables, would have offices erected on them. There is a large house, No. 18, Spring-gardens, in which Sir John Shaw Lefevre lived, which could be utilised for the officials at the Horse Guards while the new buildings are being erected.

The course suggested will not prevent the Government Offices being continued to Spring-gardens hereafter if necessary, but it will prevent a large sum being needlessly wasted now, and a large number of houses used as offices (which are much wanted in the neighbourhood) being pulled down without their being required.

If any M.P. will kindly give the question and the map a little study, he will soon no doubt be able to convince himself of the reasonableness of the proposition, and also of the fact that the Horse Guards' sentries stop the way at a probable cost to the country of many thousands a year. He can then ask the Commissioner of Works "Why the new Admiralty and War Office cannot be commenced next to the Home Office block, so as to form a continuous line of offices, and save a large sum of money to the country."

A RATEPAYER.

DARLINGTON SCHOOLS COMPETITION.

SIR,—As an unsuccessful competitor in this, permit me to express the astonishment with which I read the intimation in your last issue that the School Board, which had refused to call in an umpire, had selected the design by the son of one of its own members. Further, I notice in newspaper reports that Mr. Brooks, son, took part in the decision, and voted for his son's design.

I make no suggestion that Mr. Brooks, sen., know that "Hope" was by his own son, but I am assured that it was a notorious fact in Darlington long before the decision was made known. A COMPETITOR.

ENGINEERS' FORMULA.

SIR,—Can any engineer assist me in the following? Two points are taken at an equal distance above the ground, the distance between each being 17 ft. From the first point a body is allowed to fall by the action of gravity. How far will it have fallen when it is moving with the greatest angular velocity as seen from the second point? The above data is required for constructing some machinery.

ENGINEER.

"THE STUDENT'S GUIDE."

SIR,—In the review of this work in the *Builder* for May 31 [p. 805], it is stated that "on Plate III. are 'framed chimney-grounds.'" I beg to say that in the new edition the illustration referred to has been removed from the plate, and the term "chimney-grounds" has been struck out of the text. The reviewer must have confounded the new edition with the former ones, in which "chimney-grounds" appear on Plate III.

E. WYNDHAM TARR.

MEETINGS.

SATURDAY, JUNE 14.

International Health Exhibition Conference.—Dr. A. Wynter Blyth and Mr. Wm. Essie on the "Disposal of the Dead: Cremation." 2 p.m.

St. Paul's Ecclesiastical Society.—Visits to the Churches of St. Paul and St. Andrew, and to the Church and Remains of the Archbishop's Palace at Oxford. Train from Holborn Viaduct, 2.40.

Edinburgh Architectural Association.—Annual Excursion to Jedburgh, Kelso, and neighbourhood. 10 p.m.

MONDAY, JUNE 18.

London and Middlesex Archaeological Society.—(1) Mr. John Smith on "Arms and Armour." (2) Mr. Thomas Milbourn on "Medieval London at the Health Exhibition: Historical Associations." 8 p.m.

International Health Exhibition.—Lecture by Professor J. P. Sheldon, F.R.S., on "The English Dairy." 5.30 p.m.

Royal Asiatic Society.—(1) Professor Lacouperie "On Three Embassies from Indo-China to the Middle Kingdom about B.C. 1100, and the Way thither." (2) Dr. Duka "On the Tibetan MSS. of Cosma de Koros, given by Dr. Dr. S. Malan to the Hungarian Academy of Sciences." 4 p.m.

TUESDAY, JUNE 17.

International Health Exhibition.—Lecture by Mr. J. F. Hodgkiss on "Anglo-Saxon Dress, Food, and Houses." 5.30 p.m.

Institute of British Carriage Manufacturers (Westminster Town-hall).—Mr. W. T. Sheldon on "The Art of the Carriage-axe Manufacturer." 7.30 p.m.

Royal Meteorological Society.—Commemorative Dinner at the Holborn Restaurant. 6.30 p.m.

WEDNESDAY, JUNE 18.

Builders' Foremen and Clerks of Works Institution.—Half-yearly Meeting. 8 p.m.

Royal Meteorological Society.—Mr. R. H. Scott on "The Equinoctial Gales.—Do they occur in the British Isles?" Surgeon-Major Black on "The Climate of the Delta of Egypt in 1784-1872, during the French and British Campaigns"; and two other papers. 7 p.m.

THURSDAY, JUNE 19.

Society of Antiquaries.—(1) Major Cooper-Cooper, F.S.A., on Some Clay Bars and Pottery from Bedfordshire. (2) Edwin Freshfield, V.P., on "The Palace of the Greek Emperors of Sicily at Nympha." 8.30 p.m.

Chemical Society.—8 p.m.

Miscellanea.

British Archaeological Association.

The closing meeting of this association for the present session was held on the 4th inst. Mr. Thos. Morgan, F.S.A., in the chair. Mr. J. W. Grover, F.S.A., read a description of a tumulus still existing in the grounds of one of the modern houses in Cedars-road, Clapham-common, which is shown on old maps prior to the district being built over. It is called Mount Nod, but there is no evidence to show if it is of comparatively modern or prehistoric date. The old house of Sir Dennis Gordon, where Popsy died, stood close to the spot. A discussion ensued, in which Messrs. Compton, Kershaw, Brook, and others took part, reference being made to the old Huguenot Cemetery, Mount Nod, at Wandsworth, nearly two miles away, being called by the same name, apparently from the fields, so called, extending to these. The position is an enclosed one, commanding a view over the Thames Valley. Excavations will probably be made. Mr. Roach Smith, F.S.A., contributed a paper, read by Mr. W. de Gray Birch, F.S.A., on Old Winchester, in which he showed that the so-called Roman camp is in reality an ancient British Oppidum of considerable size. Mr. Loftus Brock, F.S.A., read a paper on an ancient chapel of thirteenth century date, which still exists at the entry into Dover, close to the Maison Dieu, hidden behind the modern houses of Biggin-street, and hitherto unnoticed. It is used as a blacksmith's shop and for various other purposes. The Reverend Prebendary Scarth forwarded a paper, read by Mr. Birch, on an ancient harpsichord which formerly belonged to Tasso. It was at Sorrento, and is dated 1564. It is decorated with paintings of Apollo and the Muses, and is in fair condition. The connection between the harpsichord and other similar instruments with the piano of modern times was referred to and discussed. The progress of the arrangements for the Congress at Tenby were detailed. The meeting will commence on Sept. 2, ending on the 11th, the Bishop of St. David's being president.

Infectious Diseases Hospital for Oxford. The Oxford Local Board have accepted a tender for the erection of an Infectious Diseases Hospital, from the plans of Mr. W. H. White, M. Inst. C.E., their surveyor. There will be two detached pavilions, each providing for twelve beds, a special ward pavilion for two beds, an administrative block, laundry, ambulance-house, mortuary, and disinfecting-house. The buildings and grounds will be inclosed by a wall 7 ft. in height. The site, five acres in extent, adjoins the road from Oxford to Abingdon, about a mile from Oxford.

Clacton-on-Sea.—This new watering-place seems to be rising in popular favour, if we may judge from the report of the Clacton-on-Sea Land and Building Company, submitted to the half-yearly general meeting held on the 28th ult. The directors state that the past winter has been very favourable to building operations, and considerable activity in this respect has prevailed at Clacton-on-Sea. Several houses and shops have been erected, and the demand for premises for occupation or purchase is reported to be very good. Amongst the new buildings may be mentioned the Convalescent Home for the county of Essex, erected by the Perry Wallington Memorial Committee. The selection of Clacton-on-Sea for the establishment of this institution is regarded as a gratifying proof of the health-giving nature of its climate. Since the last annual meeting the directors have purchased a further quantity of land at Clacton-on-Sea, situated in the centre of the place and ripe for immediate building. A portion of this land will be offered for sale in plots on the 30th inst., as will be seen by an advertisement in our columns.

The Sunday Society.—A party of members of the Sunday Society visited Apsley House on Sunday last. The Waterloo Gallery, Museum, and other rooms, with their historical collections, were thrown open. Amongst those present were Sir Arthur Hobhouse, Rev. Wm. Rogers, and the hon. sec., Mr. Mark H. Judge. On the motion of the Rev. Wm. Rogers, a most cordial vote of thanks was passed to his Grace the Duke of Wellington for thus opening his house to the members of the Society. The Society has prepared a memorial to the Executive Council of the International Health Exhibition, praying that the Exhibition be opened on at least one Sunday afternoon in each month. "This," they urge, "would not only make the Exhibition available to the thousands who now on Sundays visit the Kew Museums, the Hampton Court Galleries, and the Painted Hall at Greenwich, but would prove a boon to thousands besides who cannot afford the expense attending a visit to the exhibitions located in the distant suburbs named."

Building Improvements in Cheapside.—The Land and House Investment Society having purchased the lease for eighty years of the premises in Cheapside between Wood-street and Gutter-lane, are at present erecting a pile of new buildings on the site. A portion of the block nearest to Wood-street has just been completed. The ground-floor is intended for shops, and the upper portion of the premises for offices and chambers. The elevation is faced with Portland stone, and is carried to a height of nearly 60 ft. One of the principal features in the facade consists of massive three-light oriel windows on the second floor, the carving and moulding of the stone work being rich and elaborate. The elevation is surmounted by gables and dormers. The company themselves intend to occupy a part of the finished premises. Messrs. Ford & Hesketh, of Aldermanbury, are the architects, and Mr. W. Brass, of Old-street, is the contractor.

Society of Arts.—The Albert Medal of the Society of Arts, instituted in 1862 as a memorial of his Royal Highness the Prince Consort, and given annually "for distinguished merit in promoting arts, manufactures, or commerce," has been awarded by the Council of the Society, with the approval of his Royal Highness the Prince of Wales, the President, to Captain James Buchanan Eads, "the distinguished American engineer, whose works have been of such great service in improving the water communications of North America, and have thereby rendered valuable aid to the commerce of the world."

New Colossal Group.—According to the *Tägliche Rundschau* a group has just been completed at Frankfurt-on-Main by Professor Gustav Kaupter, of the Städel Institute, which has been receiving much attention in artistic circles. It has occupied the artist for three years, and is entitled "Perseus and Andromeda." The moment selected for illustration is that at which the hero of the story has killed the dragon and is carrying off Andromeda. The group is about 8 ft. in height.

Darlington Free Library.—The corner stone of this new building was laid on the 4th inst. by Sir J. W. Pease, the building being the gift to the town of the late Mr. E. Pease. The architect is Mr. G. G. Hoskins, of Darlington, and the cost of the building will be between 7,000l. and 8,000l.

Soft v. Hard Water.—At a meeting of the Society of Engineers, held on Monday, the 9th inst., at the Westminster Town-hall, Mr. Arthur Rigg, President, in the chair, a paper was read by Mr. J. C. Fell, on "Soft v. Hard Water for Manufacturing Purposes." The author commenced by giving the chemical distinctions between hard and soft water, and the practical distinction between temporary and permanent hardness, and explained what salts held in solution constituted the hardness. The author then proceeded to point out the loss of economy resulting from the use of too hard water in steam boilers, and in the bleaching and brewing trades, and its injurious effect upon animal and vegetable life. The evils of hard water having been described, the author gave the various softening processes in use, and their comparative advantages, instancing Prof. Clarke's chemical process and Mr. Porter's improvements thereupon, Mr. Maignen's anti-calcare process, and Mr. Field's Electrical Scale Preventer. The paper was elucidated by a series of experiments.

Value of Land in Westminster.—Last week Messrs. Horne, Son, & Everfield offered for sale, at the Auction Mart, the freehold site of building land in Westminster, adjoining the new Town-hall, belonging to the Guardians of St. George's Union. The property covers an area of nearly 34,000 superficial feet, and has a frontage of 155 ft. to Carton-street and a back frontage of 110 ft. to St. Ermin's-hill. The auctioneer pointed out that there would shortly be a direct thoroughfare between Victoria-street and the new Town-hall, which would greatly increase the value of the land now submitted for sale, while its close proximity to St. James's Park was also in its favour. There was a large attendance at the sale, with an active and spirited competition for the property, which was ultimately sold for 25,000*l.*, being at the rate of about 15s. per foot.

Dairy Show, Agricultural Hall.—This is fixed for October 7th to 10th inclusive, the last day for entries being Monday, August 25th. The show will include designs for a dairy homestead on a farm of 180 acres, comprising a ground plan of the house, and plans, sections, and elevations of farm buildings; total cost not to exceed 2,500*l.* Further particulars about this and the general exhibits may be obtained from Mr. F. Morrison, secretary, 191, Fleet-street. As the day fixed for last entries allows a good period before this exhibition shall be in order when opened, which exhibitions at the Agricultural Hall very seldom are.

An Electric Railway in Switzerland.—It is proposed to construct an electric railway between the Hôtel des Alpes at Chillon and the Hôtel de Mont Fleury at Montreux. The difference in altitude of these two points is about 180 metres. Preliminary experiments have already been made. An electric motor placed on the car drives a cog-wheel; this wheel gears into a central cogged rail, and in this way the car is made to traverse the ascent. Conductors placed alongside the central rail convey the current of the generator, which is driven by a five-horse-power locomotive. It is intended to drive the dynamo by water-power for the future.—*Electrician.*

Examination of Local Surveyors and Inspectors of Nuisances.—At an examination held by the Sanitary Institute of Great Britain, on June 5th and 6th, twenty-three candidates presented themselves. The Institute's certificate of competency to discharge the duties of local surveyors was awarded to W. H. Radford, J. B. Wilson, Charles Gibby, and W. Tattersall; and to discharge the duties of inspectors of nuisances, R. Gibbs, G. W. Jobbins, Kenneth Cameron, T. S. Ainsie, T. Turner, R. Jeffery, J. Parker, J. Mallinson, W. A. Shafrake, W. C. Beck, T. Haslam, P. T. Poulson, J. Whyte, A. Sutcliffe, and J. J. Easton.

St. Botolph, Aldgate, Church Restoration Fund.—What may be called a Medieval Bazaar in aid of this fund is to be opened at the Cannon-street Hotel, on the 17th inst., by the Lord Mayor. "St. Buttolf's Fayre," as it is called on the quaintly-worded programme, will include "Ye famous Streete of Aldgate in the antique Ward of Portoken." The bazaar will remain open on the 18th and 19th.

New Warehouse and Factory, Warwick.—The contractor for these works, referred to on p. 843 of last week's *Builder*, was Mr. O. Richardson, of Albert-road, Peckham-rye, at Messrs. "Richardson & Son."

Metal Industry of Greece.—Since the year 1862, considerable attention has been paid to the above industry, which had been brought to a high degree of progress in Ancient Greece. More than 1,000 workpeople are now engaged in connexion with the metal trade, and the capital employed is about 3,000,000*l.* sterling. Saurium, the most important seat of the industry, has only commenced its existence as a populated centre since 1863, and it numbers at present 16,000 inhabitants. There are also, throughout Greece, mines of argentiferous lead, zinc, and iron; quarries of ochre and carbonate of magnesia likewise exist, but are not being worked, on account of the necessary capital not being available for the purpose.—*Society of Arts Journal.*

Ryton-on-Tyne.—The Thorp schools, which were erected by the late Archdeacon Thorp, are about to be enlarged, and new porches and latrines added, whilst the playgrounds are to be thoroughly drained to bring the schools more into harmony with modern sanitary requirements. Mr. J. J. Lish, Newcastle-upon-Tyne, is the architect for the works. The same architect is also engaged in carrying out alterations to the Greenside schools, which the Vicar and managers intend to enlarge and supply with better sanitary arrangements.

Value of Cement Works.—A sale which took place at the Auction Mart last week shows Robins & Co.'s Cement Works in Belgravia to be an exceedingly valuable property. Messrs. Rogers, Chapman, & Co. submitted for sale 100,201 shares in the company, 10*l.* per share only having been paid, or 1,000*l.* altogether as the nominal value of the property, for which there was an active demand at high premium rates. The shares realised an aggregate sum of 7,623*l.*, amounting to a premium value of nearly 800 per cent.

Winchester.—The selected design for the memorial proposed to be erected at Winchester to commemorate the celebration of the 700th anniversary of the mayoralty of that city was prepared by Mr. J. B. Colson, of Winchester, and submitted in competition (by invitation) by a design by Mr. C. R. Pink, of Winchester and London. The cost will be about 350*l.*

Institution of Civil Engineers for Ireland.—Mr. F. Browne read before this Society, on the 4th ult., a useful and practical paper on "The New Masonry Gas-holder Tank of the Alliance and Dublin Consumers' Gas Company." Those who may have to construct or advise about such a structure will find it worth while to refer to Mr. Browne's paper.

Surveyorship, Toxteth Park Local Board.—The name of the late engineer to this Board was J. A. Hall, not "Hale," as stated in the paragraph on p. 843 of our last number.

TENDERS.

For alterations and additions to St. Marylebone parish church, Mr. F. H. A. Hardcastle:—

Trollope	£12,225 0 0
Hall, Biddall, & Co.	11,948 0 0
Wall Bros.	11,679 0 0
Asby Bros.	11,443 0 0
Corder	11,353 0 0

For the erection of house, cow-sheds, &c., at farm premises in the parish of Brinklow, for the Rectory of Holy Trinity Church Estate. Mr. Herbert W. Chastaway, architect, Trinity Churchyard, Coventry:—

R. Lord, Coventry	£579 3 0
Hallam & Co., Coventry	670 0 0
R. Wootton, Coventry	550 13 0
J. Woodcock, Coventry	511 0 0
T. Mayo, Coventry	500 0 0
Blakenham & Son, Coventry	483 17 0
C. Garlick, Coventry	453 0 0
A. Lester, Coventry (accepted)	426 0 0
T. Wright, Foleshill	383 4 6

For alterations and additions to the Railway Tavern, Streatham Common, for Mr. T. E. Cross, Mr. S. B. Grosvenor, architect, 23, Southampton-buildings, Chancery-lane:—

Johns	£424 0 0
Gould & Brand	390 0 0
Canning & Mullins	367 0 0
Pickersill	378 0 0
Older Bros.	357 4 1
John Anley	348 0 0
Langmad & Way	334 0 0

* Accepted conditionally.

For pulling down and rebuilding Nos. 200 and 201, Sloane-street. Mr. F. W. Hamilton, architect. Quantities by Mr. C. W. Brooks:—

Kirk & Randall	£4,370 0 0
Turtle & Appleton	4,263 0 0
Oldrey	4,100 0 0
Wall Bros.	3,967 0 0
Chas. Wall, Coventry	3,950 0 0
Lucas & Son	3,769 0 0
Craske	3,547 0 0

For a detached house in De Pary's-avenue, Bedford, for Mr. F. G. Marks. Mr. John Day, architect, Bedford:—

Kimberley, Banbury	£1,238 0 0
Watts & Lester, Bedford	1,130 0 0
Curly & Son, Bedford	1,002 0 0
Potter, Bedford	1,068 13 0
Foster, Bedford	1,053 0 0
Smith, Bedford	1,029 0 0
Warton & Walker, Bedford	1,010 0 0

* Accepted.

For a detached house in De Pary's-avenue, Bedford, for Mr. A. G. Shelton. Mr. John Day, architect:—

Knigh & Heston, Bedford	£830 0 0
Corry & Son, Bedford	856 0 0
Lilley, Bedford	847 10 0

For additions to shop and premises, High-street, St. Peter's, Bedford, for Mr. Rose, organist. Mr. John Day, architect:—

Foster, Bedford	£399 0 0
Potter, Bedford	395 0 0
Adams, Bedford	385 0 0
Smith, Bedford (accepted)	387 7 0

For a third nave or north aisle to St. Paul's Church, Bedford. Mr. John Day, Diocesan Surveyor, Bedford:—

G. Haynes, Bedford	£3,500 0 0
Foster, Bedford	3,249 0 0
Miskin, St. Alban's	3,250 0 0
Bell & Sons, Cambridge	3,230 0 0
Corriss & Geymer, North Walsham	3,150 0 0
Osborne, St. Neot's	2,828 0 0
Franklin, Deddington, Oxon	2,765 0 0
Claridge, Banbury	2,721 0 0
Kimberley, Banbury	2,685 0 0

For rebuilding No. 34, King-street, Cheapside. Mr. Richard Creed, architect, No. 45, Great Marlborough-street:—

E. Lawrence & Sons	£3,695 0 0
G. H. & A. Bywaters	2,685 0 0
Wm. Bras	2,660 0 0
Wm. Bangs & Co.	2,590 0 0
Ptman & Fotheringham	2,577 0 0
Collis & Sons	2,470 0 0
B. E. Nightingale	2,363 0 0

For the erection of four houses in Redman's-road, Mile-end, for Mr. Henry Hymans. Mr. C. A. Legg, architect, Mile-end:—

Houses.		Boundary Walls, &c.	
M. A. Palmer & Sons	£2,245	425	
Heasle & Son	2,245	87	
J. Walker	2,153	80	
J. Parfit	2,159	69	
S. Barnett	2,141	118	
J. R. Hunt	2,121	80	
J. Croft	1,889	87	
M. Calnan & Co.	1,871	93	

For the erection of new church of St. Bede, Liverpool. Messrs. J. E. K. Cutts & A. H. Mackmurdo, architects:—

W. Tomkinson & Son	£8,585 0 0
Jones & Sons	8,507 0 0
J. Henshaw	8,312 10 0
J. Leslie	6,263 0 0
W. Thornton & Sons	6,232 0 0
T. Urmon	6,019 11 6
Hughes & Stirling	6,045 0 0
Brown & Backhouse	6,011 0 0
S. Webster	5,983 0 0

For additions to mansion at Badgemore, near Henley, Oxon, for Mr. Richard Ovey. Mr. John Norton, architect. Quantities by Mr. S. J. Thacker:—

Holland & Hansen	£17,376 0 0
Aldin & Plattner	16,678 0 0
Lawson & Sons	15,284 0 0
Peto Bros.	14,223 0 0
Boyes	14,140 0 0

For St. Andrew's Home and Club, Westminster. Mr. E. Gregg, architect. Mr. S. Young, surveyor:—

Hall, Biddall, & Co.	£8,985 0 0
Asby Bros.	8,543 0 0
L. H. & R. Roberts	8,327 0 0
Peto Bros.	6,176 0 0
Bywaters	5,921 0 0

For the erection of new foundry, pattern-shop, and additions to offices, &c., in Tabard-street, for Messrs. J. Dewrance & Co. Messrs. Geo. Landwone & Harris, architects:—

Hags & Hill	£5,260 0 0
Dove	5,190 0 0
Greenwood	5,180 0 0
Kirk & Randall	5,073 0 0
Bider	4,930 0 0
Wall	4,872 0 0
Shepherd	4,868 0 0
Lea	4,729 0 0
Chappell	4,591 0 0
Corder	4,585 0 0
Hall	4,540 0 0
Colls	4,594 0 0
Canning & Mullins	4,485 0 0
Bird	4,335 0 0
Tarrant & Son	4,200 0 0

For fishing-box and boat-house to be erected at Docket Point, near Chertsey. Mr. C. Welch, architect and surveyor, London-street, Chertsey:—

Fishing-box.		Boat-house.	
H. G. Neumy, Chertsey	£1,650 0 0	£189 15 0	
B. E. Nightingale, Lambeth	149 0 0	218 0 0	
J. Martin, Addlestone	885 0 0	150 0 0	
Oades & Son, Egham	837 0 0	137 0 0	
S. Woods, Weybridge	815 0 0	149 0 0	
B. J. Hunt, Chertsey	799 0 0	135 0 0	

* Accepted.

For house at Bosahan, Menage, Cornwall, for Mr. A. Pendarvis Vivian, M.P. Mr. Ewan Christian, architect :—

	In Douling	In Penryn
Stone
Gravite
Kellway	£27,701 0 0	£23,547 0 0
Lethbridge & May	23,800 0 0	27,000 0 0
M. & J. Clements	24,440 8 6	26,907 0 0
Paranore & Son	23,137 0 0	25,103 0 0
Blowey	22,700 0 0	24,500 0 0
Gleanland	22,547 0 0	24,997 0 0
W. Sharnur	22,444 0 0	25,378 0 0
W. Bone	22,350 0 0	25,250 0 0
Estcourt	21,331 0 0	24,696 0 0
W. Dart	21,631 12 8	24,556 12 6
Oliver & Sons	21,631 0 0	24,483 18 0
Berry	20,801 0 0	22,240 0 0
Foster & Dickson	20,351 0 0	22,883 0 0
Finch & Son	19,288 0 0	23,354 0 0
Clark	17,773 0 0	19,823 0 0

For rebuilding a dwelling-house and shop, for Mr. Owens, in the Roman-road, North Bow. Mr. Charles E. Jackson, architect :—

C. Collins	£214 0 0
G. Hardy	43 0 0
J. Evans	470 0 0
R. Brooks & Son	427 0 0
C. Everard (accepted)	409 0 0

For the erection of new business premises, Market-place, 8, King-street, South Shields, for Mr. Thos. Crofton. Mr. Henry Grieves, architect. Quantities by Mr. G. D. Irwin, Sunderland :—

Alex. Thompson, Gateshead	£2,010 13 11
John Elliott, North Shields	1,728 0 0
Wm. M. Hudson, South Shields	1,587 19 9
John L. Miller, Gateshead	1,481 6 6

* Accepted.

For new shop, alterations, and additions to property, Wellington-street, South Shields, for Mr. H. T. Daucad. Mr. Henry Grieves, architect, Fowler-street, South Shields :—

John Moore, South Shields	£235 0 0
Haggerston & Ormsby, South Shields	325 0 0
Geo. W. Weddell, South Shields	313 0 0

* Accepted.

For the erection of a detached residence in Shepherd's Hill-road, Hornsey, for Mr. W. Love. Mr. John Hamilton, architect :—

Boyes	£1,608 0 0
Hayworth	1,545 0 0
Scott	1,495 0 0
Calver	1,467 0 0
H. Harper	1,418 0 0
Harris & Wardrop	1,393 0 0
Sharnur	1,339 0 0
Harris	1,339 0 0
Woolveridge Bros. Clayton	1,315 9 0

* Accepted.

For the erection of a mission church and vestry, in the parish of St. Michael and All Angels, Maidstone. Mr. H. Beasted, architect :—

Walls & Clements	£234 0 0
Froud, jun.	837 0 0
Atard	793 0 0
Elmore	770 0 0
Vaughan (accepted)	747 0 0

(All of Maidstone)

For five cottages, Tottenham. Mr. Francis G. Lee, architect :—

Wilkinson, Finsbury Park	£1,493 0 0
Beward, Bermondsey	1,445 0 0
Mullinson, Shepherd-bush	1,433 10 0
Baxter, Upton	1,248 0 0
Webb & Rosser, Hammersmith	1,175 0 0
Dickson, Battersea	1,167 0 0
W. J. Wheeler, Richmond	1,050 0 0
Lanzell, Tottenham	890 0 0
Manning, Barnes	950 0 0
Sanders, Dulwich	950 0 0
Bullock, Kennington	945 0 0
Wyman, Edmonton (accepted)	893 0 0

For making-up roadway and paving the footways of Falsaff-yard Tabard-street, for the Vestry of St. George the Martyr, Southwark. Mr. A. M. Hiscocks, engineer and surveyor :—

Treharne	£246 0 0
Beavers	223 0 0
Mowlem & Co.	192 0 0
Rock Asphalt Company	175 0 0
Wheeler & Hundle	174 0 0
G. Butler (accepted)	163 0 0

For proposed new Board-room at Hampton Wick, for the Local Board. Mr. R. T. Elsmu, architect, Surveyor to the Board. Quantities supplied by the architect :—

East Bros, Kingston	£218 5 0
Wheatley & Sons, East Molesey	808 0 0
T. J. Messom, Trickham	691 0 0
J. Spinks & Sons, Hampton Wick	678 0 0
C. & F. Adkins, Surbiton	677 0 0
J. H. Jarvis, Surbiton Hill	649 0 0
Babbs Bros, Surbiton Hill	645 0 0
W. R. Woods, Hampton Wick	635 0 0
T. Brunsden & Co., Brentford	633 0 0
Harris, Teddington	633 0 0
C. T. Bartlett, Teddington	625 0 0
W. Brown, Kingston	613 15 0
E. Wells, Kingston	607 0 0
C. E. Oldridge & Sons, Norbiton	599 10 0
John Piller, Teddington	580 0 0
Thos. Hiscock, Hounslow	530 0 0
C. Bonell, Teddington (accepted)	540 0 0

For the restoration of the tower and south aisles of St. Matthew's Church, Ipswich. Mr. Bishop, architect, Ipswich :—

R. S. Smith, Ipswich	£1,377 7 0
G. Kenney, Ipswich	1,174 10 0
T. Thwaites, Ipswich	1,165 0 0
B. Tooley, Ipswich (accepted)	1,075 0 0

For the completion of "Branksomdene," Honor Oak, for Mr. E. P. Trenchard. Mr. Herbert D. Appleton, architect, Wool Exchange :—

H. L. Holloway	£235 0 0
M. Redman	635 0 0

For alterations and additions to the Marquis of Granby Tavern, Drury-lane, for Messrs. Barclay, Perkins, & Co. Mr. E. Pollard, architect :—

Forrest	£253 0 0
Langmead & Way	244 0 0
Beale (accepted)	226 0 0

Grand Hotel, Brighton. — In the list of tenders for works here (published on p. 844), Messrs. James Smith & Sons' tender should have been marked "accepted."

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

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And Farleigh Down.
BANDELL, SAUNDERS, & CO., Limited,
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50,000 feet cube in stock.
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INTERNATIONAL HEALTH EXHIBITION

Supplements to The Builder.

No. 5. JUNE 14, 1884.

AMBULANCE.—GROUP IIIA.

BY A SURGEON.



AMONG the most pertinent and original exhibits at the Health Exhibition at South Kensington are the aids to the sick and wounded in war and in peace, which are grouped at one end of the Queen's Gate Annex, adjoining "Belgium." A very

few years ago ambulance for popular use was unknown, and it is to the benevolent employment of civil aids in the Franco-German and subsequent wars that we owe the adoption of the contrivances for succouring the wounded in war to rescuing the sick and injured following peaceful occupations. In the catalogue a distinction is drawn between the aids for the sick and wounded in war and those for the sick and injured in peace, but the difference is one rather of degree than of kind, as, the conditions of their employment being similar, the apparatus are necessarily of similar construction. Completely equipped ambulances for use in war are exhibited by the British and Belgian Army Medical Departments, and deserve examination for the practical and serviceable character of the appliances and the ingenuity of their disposal. For civil purposes such ambulances are not needed, as stores of surgical instruments and drugs are to be found in every hospital and private surgery, but they are suggestive of the great extent of such requirements and the newest and most economic forms they assume. Indeed, in mining districts and where large excavations are going on, as in the construction of docks and railways, the complete army ambulance might well take the place of the temporary and often incompletely equipped local surgery.

The aids for the sick and injured in peace are well seen on the Stand (1,064) of the St. John's Ambulance Association, and the adjoining one (1,063) occupied by the carriages exhibited by Mr. John Furley, who conjointly have been the pioneers of the movement. The means of removing the sick and injured from the scene of accident or from the home to the hospital, are necessarily limited, and the variations observed in the numerous exhibits are intended to meet unusual and accidental conditions of position, space, &c. For removing the patient in the recumbent position there are numerous stretchers which may be carried by hand, on two or more wheels, or in spring vans; and for removing them in the sitting position there are chairs with handles, innumerable modifications of the Bath chair, and of ordinary vans and carriages. Of the common stretcher, examples are found in the stalls of the Army Ambulance (1,045) and the St. John's Ambulance Association (1,064 and 1,066), some of the latter modified for use in mines, sewers, and confined spaces. Thus the handles of one are made telescopic, and another is fitted with a jacket to secure the patient to the stretcher in order that he may be removed in the upright position. The strong folding police stretcher, which runs on a pair of wheels with springs, like a hand barrow, and furnished with a cover, appears to us the most generally useful of all these appliances for civil purposes, where the roads are tolerably good and the distance to be traversed is not great. The room required for housing this and other stretchers is considerable, and when this is a consideration the Ashantee pocket hammocks, exhibited by Seydel & Co. (1,062), might be used as a substitute. Indeed, we are surprised that the lightness, cheapness, and portableness of these hammocks has not recommended their use to the police and ambulance associations. The weight

of one of them is about 2 lb., and it can be carried in the coat-pocket, and its cost is only a few shillings. For carrying invalids in the sitting position there are several chairs, with handles in front and behind, one of the most convenient and economical of which is exhibited by J. Ward (1,034) as a "carrying chair, made portable for travelling." When folded up it occupies little more space than an ordinary camp-stool, and we think it should not only form a part of the impedimenta of the travelling invalid, but also an item of the furniture of every household. Other chairs of a similar, but more expensive and luxurious form, are exhibited by Carter (1,029), McIlroy (1,030), and other firms.

Of invalid chairs, couches, and beds (one of which, exhibited by Leveson & Sons (1,027), is priced at fifty guineas and called an invalid ambulance), there is a most ample supply,—enough, we think, to meet every whim of the valetudinarian, and even suggest new ones to his already too fertile brain. These vehicles are forms of house furniture, and hardly come within the meaning of ambulance appliances, and we therefore pass them over in this article. We were glad to learn from one of the exhibitors that that once very familiar piece of furniture, the spinal couch, has fallen much in price lately because there is little demand for it. It is satisfactory to learn on such good authority that improved medical knowledge and more rational physical occupations of girls are so rapidly abolishing that great *opprobrium medicum*, the so-called spinal complaint.

Examples of ambulance-vans, omnibuses, and carriages are exhibited by Mr. Furley (1,063), the Metropolitan Asylums Board (1,047), and J. Offord (1,041), all of which are adapted for the removal of either sick or surgical cases. The van exhibited by the Asylums Board being intended specially for the removal of infectious cases, is well coated with varnish inside, but otherwise contains no special arrangement for being disinfected. The whole of these vehicles, not excepting Mr. Furley's village ambulance-carriage, appear to us to be unnecessarily elaborate and expensively got up, and we are at a loss to know why a light van, constructed on the lines of the army ambulance-wagon, has not been adopted. The great expense of providing such carriages must necessarily limit and often preclude their use altogether; and when it is borne in mind that their chief use is for the conveyance of the poorer classes, the refinements of the coachbuilder's art might well be dispensed with. It is the natural tendency of exhibitions of the kind now being held at South Kensington to favour the production of showy things rather than really useful ones; but the serious work to which ambulance is devoted, and the yet uncertain position which the movement has attained in popular favour, ought to have prevented the exhibitors in this section from falling into the errors which are so common, but which are more excusable in other parts of the Exhibition.

SANITARY HOUSE CONSTRUCTION, DAMP-PROOF AND FIRE-PROOF BUILDING MATERIALS, &c.

For the remainder of our notes of the exhibits in Class XXVIII., we will deal first with those relating to damp-proof and fire-proof construction and materials irrespective of the numbering of the stands, as those exhibits are more germane to the subjects of our heading. The Boulmikon Felt Company, of Paternoster-square, E.C., and Manchester (Stand 822), show a large assortment of felts for various uses, including woollen underfelt, paper carpet underfelt, cotton backed untear-

able felt, and a waterproof felt. The untearable material is stated to be damp-proof, and it can be taken up and relaid several times. The waterproof or "Lotus" material is put forward as a speciality for laying on stone and damp floors, and also for roofing and damp courses. The patent stair-pade will certainly be found serviceable for making the treads noiseless, and saving the carpeting from too rapid wear. *En passant*, we may observe that felt of most kinds has recently been much improved in its manufacture, and as applied to roofing and damp-courses, when well manufactured it is proving a very valuable material within certain limits of duration. Messrs. Engert & Rolfe, Barchester-street, E.C. (Stand 823) display a number of exhibits kindred to the foregoing, including asphalt and felt for roofing and lining roofs; inodorous bitumen felt for roofs, damp walls, and iron houses; hair felt for roof lining, protecting water-pipes from frost, deadening sound; and fibrous asphalt anti-damp course. These goods appear to be of excellent manufacture, and we have little doubt from an experience of the use of felt that a portion of those put forward will fully answer expectations. Messrs. Frederick Jones & Co., Perren-street, N.W. (Stand 827), present specimens of a rather newly introduced material entitled "Silicate Cotton." This substance is a mineral fibre manufactured from blast furnace slag, and it is otherwise named "slag wool." There are models on view showing its application for fire-proofing and sound-proofing, and for preventing the transmission of heat or cold. Our experience of this new material is too short to enable us to say to what extent it is fire-proof, sound-proof, heat-proof, and vermin-proof. The material is put forward as applicable to ceilings and floorings with either wooden joists or iron girders, and also for covering steam boilers and pipes, hot and cold water pipes, cisterns, refrigerator chambers, &c. If silicate cotton is successful even in a tithe of these cases of application, it must prove highly serviceable. Messrs. Clark, Bunnett, & Co., Rathbone-place, Oxford-street (Stand 824), have some very valuable exhibits in respect to fire-proof construction, accompanied by drawings and sections of buildings in London where they have carried out work on their system. We have spoken more than once on former occasions of the merits of the fire-proof construction as carried out by the exhibitors. There is on view in the present instance parts of a solid floor on the floor-board surface, and again a combination of concrete and wood. The plank flooring and its fixing, the interior body of concrete, the girder work in all parts, in disposition and arrangement are exceedingly well and practically carried out. The underneath finishing of the fire-proof flooring is in selenitic plaster. Sections are given of the "Ligno" concrete floors 6 in., 7 in., and 8 in. thick. Accepting, as we said at the outset, "fire-proof" as a relative term, Messrs. Clark, Bunnett, & Co.'s construction may be counted upon as one of a reliable character. Mr. William White, Abergavenny (Stand 890), exhibits his very favourably-received and largely used "Hygeian Rock Building Composition" specimens of walling and water-tanks constructed with its aid, impervious walling, and an improved method of building walls to render them damp-proof, and to increase their strength. A portion of a brick wall *in situ* is shown, in which the courses are treated with this composition; and as a test of its strength a weight is suspended of such a trying character as might be reasonably supposed to crack or tear the brickwork asunder. But it remains stable under the

severe test. The advantages in using this composition are that by its aid walls one brick thick can be substituted for walls two bricks thick, the former being as strong, if not stronger, than two-brick walls constructed in the ordinary way. The composition is also applicable in the construction of reservoirs and tanks, swimming-baths, gas-holders, sea-walls, dock-walls, and silos for ensilage. The composition may be safely pronounced a good damp-proof material, and in every way worthy of extended use. On the score of cost, too, there will be a saving in the use of this composition.

The Patent Durable-Roofing Felt Company, Stamford-street, Blackfriars (Stand 834), display an assortment of their durable roofing felt for covering roofs, for preventing damp in walls, for resisting fire, and a sanitary disinfectant. These exhibits do not materially differ in manufacture from some felts already noticed, but we may say that those on view are apparently of a good description. The Reed Lathing Company, Great Tower-street, E.C. (Stand 833), present a webbing of reed in substitution of laths as a basis for plaster work. Partitions and ceilings formed of the material are shown in different stages of preparation. The advantages claimed for this system of plastering are durability, material economy, rapid fixing and deadening of sound, and freedom from cracks. The plaster work, as far as we examined it, looks fair enough, but we see no novelty in the use of the reeds, which have been used in different parts of England for several centuries as a basis for plaster work. Under a strong fire we fear this plaster construction (when subjected to the action of water in fire extinction, and the chemical changes developed under such conditions) would rapidly succumb. But the use of reeds in ordinary cases may prove economical. Messrs. Francis & Co., Vauxhall, S.E. (Stand 831), show excellent specimens of their Portland and Parisian cements and plaster-of-Paris, together with a testing machine. A block of Portland cement, section 14 in., is shown between the jaws of the machine, tested to 1,500 lb. A small model of a house, with concrete walls, finished off with Portland cement, is on view. This cement can be used for bases, mouldings, columns, slabs, &c. There are also presented specimens of cement concrete, made of 12 ballast to 1 cement; 9 ballast to ditto, and 6 ballast to ditto. All the exhibits are excellent, and of a satisfactory kind. Mr. William H. Bateman, Cannon-street, E.C. (Stand 828), has on view specimens of wood prepared by Sir William Burnett's process, also canvas and fire hose subjected to the same process, with specimens of Sir William's improved system of wood-brick flooring. A model of an apparatus used in this process for preserving timber is also on view. There are so many processes before the public for preserving timber by the application of chemical agents, and for preventing the ravages of dry rot and wood-boring insects, that it is impossible to say which is the best method. Circumstances must govern the application of a number of processes, for what is suitable under some conditions of the employment of timber will not be found to answer under other conditions.

Among the few other remaining exhibits in Class XXVII., some have already been incidentally noticed in articles on Sanitary House Decoration, and the remainder are in course of notices under other classes of exhibits. It may be said here, however, that the exhibits of Phillip's Patent Lock-Jaw Tile Company (Stand 837), the Bracknell Pottery, Brick, and Tile Company (Stand 838), the Wortley Fire Clay Company (Stand 842), Messrs. W. Ingham & Sons, Bucklersbury, E.C. (Stand 840), and a couple of new exhibitors of similar wares, that their goods in roofing tiles, bricks, and terra cotta objects are up to the usual standards. Besides glazed stoneware for various purposes, the last-named firm exhibits some good vitrified red bricks for sewers, capable of resisting the destructive action of sewer gases.

We have now exhausted all the exhibits calling for notice in Class XXVIII., and it may be seen that they are for the most part of an important character. In those relating to damp and fire-proof construction some advance has been made, but much yet remains to be accomplished in these departments of the building art before exhibitors, builders, or the general public can feel satisfied that the limits of healthy and secure construction have been reached.

INDIA.

The Indian exhibits, which occupy a space at the west end of the Central Gallery, are, as might be expected, principally of a decorative and artistic description, the sanitary and healthful aspect being but indirectly represented by means of condiments, tea, tobacco, &c.; but this is illustrated in a commensurate manner, and gives a good idea of the importance of this branch of the general supply, and in one instance the two classes are shown by one exhibitor, viz., Mr. Wm. Bowden, 15c, Hogarth-road, Kensington, who draws attention to a method, which seems useful, of packing tea in small quantities in tinful packets. The tinful, which is of a soft and pliable nature, is sealed by applying a hot iron where the edges overlap, the use of solder being done away with, and, as it has been shown that muriate of zinc occurs in ordinary soldering, and is an active poison, one apprehension is removed. A novelty is also shown in some Zanzibar mats of a large size, made from palm fibre of a diagonal texture close-woven by hand: the colouring is good, being both sides alike, and the stripes running transversely to the length of the mat. Some smaller mats of Cingalese fibre are of finer texture, light colour, and good quality, and very little known here. Another comparative novelty is a Cingalese reed curtain, which consists of short lengths of a species of bamboo strung together longitudinally by a fine cord, each length being separated by a glass bead, which gives a free movement and prevents chafing; the pattern is formed by having the pieces of bamboo of a different colour, so that horizontal lines, or diamond shapes, &c., of various sizes, can be obtained; although these stripes hang vertically and allow a free passage of air, they can be looped up like an ordinary curtain, and for a hot climate must be very serviceable. Some good specimens of modern Benares ware, Mooltan pottery, and rich silk embroidery, and various hand-printed and woven hangings, are also to be seen, although there is not much space to display them to advantage. Upwards of seventy specimens of wheat are on view from the different provinces of India, showing a great difference of size and shape of the grain, and it is also the intention of Mr. Bowden to show specimens of rice, which, by the way, appears to have been overlooked by all the exhibitors, and this is greatly to be wondered at, considering the important part this cereal takes in the products of so vast an area.

A very large space is allotted to Messrs. Vincent, Robinson, & Co., who fill the floor space, walls, and even the roof, with good and in some cases unusually large carpets and rugs of good quality and exceptional range of colour, and in addition to these are a few old specimens of brasswork, which are somewhat rare.

Some specimens indigo are shown by Messrs. Lebzén & Co., who bring examples, and give values, of the different kinds from Java, India, and Guatemala, but in this, as in other instances in this section, it would be of greater interest if further description were attached.

Mr. Alfred Irtman, 17, Ebury-street, Piccadilly, has a few specimens of Tussock (or Tusser) and corah silks: it is from this latter that the French make their "foulard," which is so popular among the feminine community. Also are to be seen a few specimens of modern Indian pottery, in which a European tendency of colour and form becomes visible; but a few plates are exempt from this, and one or two in particular partake more of the Rhodian character. A few curiosities are also added, amongst which are some silver Swami cigar mouth-pieces (the Swami is one of their gods which figures on every convenient and inconvenient space), brass spice-boxes with the inevitable peacock, and sundry curios of a like description.

The Indian Tea Districts Association give a large diagram of Ansell's patent tea-sorter, which is an ingenious machine for winnowing and separating the various qualities of teas, capable of dressing 500 lb. per hour. Near this is Davidson's tea-drying apparatus (the "Sirocco"), but this is apparently so self-contained that no action is visible, and to all intents and purposes might be a large stove; here, again, some description might be appended to lead visitors to take an interest in a process which at present passes unnoticed. Tobacco is represented by some very good-looking specimens of cigars and Manila cheroots, sent by John Mark, of St. Anne's-square, Manchester,

and M. R. Jurando & Co., but whether these, in a "Health" point of view, are exhibited as incitements or as warnings, we will not undertake to say.

The "Empress of India" is well worked in wool and floss silk, in a way which redeems the ordinary weakness of work in this material, some portions being very well managed; and as it has taken gold medals at Calcutta, Melbourne, Sydney, and Adelaide, it has presumably found favour. Mr. Warde, who shows this, has also some ordinary modern sandal and other wood fairings requiring no comment.

Mr. T. Wardle, of Leek, Staffordshire, shows some silk skeins of good quality, and in this case are some pieces of silk printed and woven with Indian material and dyes; these "tusser" cloths (from the Hindu "tusuru," or shuttle) are evidently from the South Kensington Museum, although not stated as such. They are, of course, selected specimens, and very delicate in pattern and colour.

The Upper Assam Tea Company show many varieties of tea, and call attention to the rapid advance in favour of the products of this and the neighbouring districts. It appears that within the past fifty years upwards of a quarter of a million acres of jungle have been cleared by our countrymen and planted with tea, employing over a quarter of a million people in the cultivation. Some small tea-plants are shown, varying somewhat in character,—one looking like a small laurel, more especially as it has a white edge like the variegated description so general; another has a serrated edge, and would be scarcely distinguishable from many of our indigenous plants. As an example of the importance which this industry has assumed, it is stated that the consumption of tea in 1883 in the United Kingdom was 170 million pounds, of which over one-third was Indian. Some of the seeds are shown, which are of the same size, shape, and colour of small chocolate drops.

One of the most interesting collections has been brought together by Messrs. Procter & Co., 428, Oxford-street, who have erected a special pavilion in keeping with their exhibits, which are of a comprehensive character, including textiles, pottery, jewellery, woodwork, musical instruments, &c., some of which are of considerable rarity. The native cleverness in their particular branch of metal work is shown in their plates and vessels and in strange juxtaposition of metals, such as silver hammered into iron and zinc, and gold into steel, in their weapons. Among the fabrics are some embroidered pardals or cotton cloths, and printed sarees of rich and strong deep colours, which make very satisfactory decorative hangings, and Benares kincobs of gold embroidery on silk, Decca and brocaded muslins from Jaipur, all of which attract attention, which seems to be divided between these and a somewhat extensive selection of native jewellery and precious stones, some of which are uncut and unmounted, and show great variety in disposition. The pieces of blackwood furniture from Bombay and Ahmedabad are good specimens, and show a more florid treatment than many similar objects, the inevitable gods being omitted, and giving place to foliage and flowers. Those who take the trouble to carefully examine this section of the Exhibition, and ask a few questions of the attendants, will find much more to interest them than is apparent at first sight, as the various objects are so spaced that they are not always fully extended or easily got at.

SANITARY FITTINGS.

To conclude our notice of the exhibits in the Eastern Annex.

Stand 542 is occupied by Messrs. George Farmiloe & Sons, of St. John-street, Smithfield, who exhibit the "Eos" water-closet, which is made in one piece of earthenware, and is, as we have pointed out on a previous occasion, a very simple and effective appliance. Messrs. Farmiloe & Sons also show their water-waste preventing cistern, for which it is claimed that it gives a full flush and after-flush without the aid of a syphon, and that it is suitable for either valve or hopper closets. The Du Bois American drawn-lead traps and bends for soil-pipes, sink and bath wastes, &c., are shown in a variety of forms at this stand, and the exhibitors also show samples of lead pipe made by them at the Island Leadmills, Limehouse, together with a good assortment of plumbers' brasswork.

Mr. John Parker, of Woodstock (Stand 544), shows his dry-earth and ash-closets, which exhibits some improvements. A urine separator

is now fitted to out-door closets; this carries the liquid away to a drain or pit, leaving the solid matter dry. This closet is fitted with seat-action, so arranged as to provide for the admission of the requisite supply of ashes to the receptacle each time the closet is used.

Stand 545 is occupied by Messrs. Lawson & Doukin, architects, Bournemouth, who exhibit what they claim to be "the only combination earth and water-closet." At the time of our visit, however, it was evidently out of order, or had not been properly fixed, and as the stand was without an attendant, or any written or printed description of the apparatus, we are not prepared to express any opinion upon the merits of the contrivance, which apparently provides for the separation of the liquids.

Messrs. G. T. Blandell & Co. (Stand No. 547), show their improved double-valve water-closet, which is suitable for use either in buildings or on board ship. It is claimed that the shape of the pan (of hopper form) is such as to prevent any lodgment of matter after the handle actuating the top valve has been raised. The after-flush is effected without any special apparatus, but the supply-pipe is of large diameter and carried entirely round the top of the pan, and the water retained in the pipe after the valve is closed is stated to be sufficient to seal the top valve. In addition to the top valve there is a second one below, which is always closed before the top one is opened, so that any direct communication between the soil-pipe and the closet is cut off. The axes of the valves work through stuffing-boxes. The motions of the upper, lower, and water-supply valves are effected by one lever. Provision can be made for running a ventilating pipe into the space between the two valves.

On Stand 548 is a half-sized working model of Mr. J. Conyers Morrell's patent self-acting cinder-sifting ash-closet, exhibited by the Sanitary Appliance Company, of Manchester. The closet makes use of household ashes for sanitary purposes by separating the dust from the cinders, a quantity of ash-dust being delivered over the soil on each use of the closet; the sifted cinders fall at the rear.

Mr. H. C. Symons (Stand 555), of George-street, Blackfriars-road, shows two or three applications of a patent taken out by him (No. 651 of 1883) for raising, lowering, and holding weights. He applies this invention to a water-waste preventing cistern and to the ordinary cottage-valve or other water-closet apparatus. An essential part of the invention consists of a belt or cord with a motor or operating weight attached to one end and an adjusting weight on the other end, the belt or cord being coiled on a stud or axle and the descent of the motor-weight retarded, partly by friction and partly by the adjusting weight. The motor-weight can thus be lowered automatically and timed in its descent by the combined action of the belt and adjusting weight. Various other arrangements are possible, but from what we have said it will be seen that the invention is applicable to a variety of purposes, the automatic closing of valves connected with water-closet flushing apparatus being among the number. The patentee's brake-closing valve cistern deserves the attention of visitors, as also does his apparatus for connexion with water-closet valves. The invention is applicable to any form of valve-closet, but the exhibitor stands somewhat in his own light by exhibiting it attached to one of the now generally and deservedly condemned pan-closets,—condemned, we may say for the information of non-technical readers because the huge iron "container" into which the basin fits and into which the "pan" empties, is a retainer of filth. Nevertheless the invention seems to be well worth attention on its own merits; but, unfortunately, the stand allotted to the exhibitor is exceedingly small, and he is placed at a further disadvantage in not being able to show his appliances in action with the use of water. It is thus impossible for visitors to fully judge of the value of the invention, and we think it might be possible to assign to the exhibitor a better position, especially as several more suitable positions are even yet unoccupied.

Stand 566 is occupied by the Domestic Engineering and Sanitary Appliances Company, who have on view some very useful fittings, including the Oxford wash-out closet and rustless slop-tray.

We have now dealt with the whole of the sanitary fittings in the Eastern Annex, but there are others scattered about in various

parts of the Exhibition, notably in that portion of the East Central Gallery, where the baths, &c., are on exhibition. This portion of the Exhibition will be noticed in our next.

HEALTH EXHIBITION CONFERENCES.

(Continued from p. 874 of the present Number.)

The meeting held on Tuesday afternoon was under the presidency of Captain Douglas Galton, C.B., F.R.S.

The first paper read was by Dr. George Wilson, Medical Officer of Health for the Mid-Warwick District, on

DOMESTIC SANITATION IN RURAL DISTRICTS.

Dr. Wilson observed that fortunately for health requirements, he believed that the population was steadily diminishing in the strictly rural parts of the country, otherwise the question of overcrowding, in consequence of the closing of dilapidated cottages, would become much more serious than it was. But when it was considered that a large proportion of the cottages which were still considered habitable only contained one sleeping-room, it must be conceded that decency could not be maintained with a growing family, and that overcrowding was common enough. One great difficulty in dealing with this question was the fact that the wages of the agricultural labourer did not enable him to pay a rental which would be sufficient to encourage private enterprise in building new cottages, even when land could be readily leased or purchased. A comfortable cottage could not be built for less than 100*l.*, and the average rent paid by agricultural labourers would not yield a higher return than three per cent. But many old cottages could be purchased at such a cheap rate that after having been put into habitable repair, they would yield a return of from ten to fifteen per cent., so that if sanitary authorities had the power to purchase and repair old cottages and build new ones in districts where the obligations of landowners were persistently neglected, he thought a vast improvement could be speedily effected without unduly increasing the rates. There ought to be an amendment of the Public Health Act to enable sanitary authorities to enforce by-laws, not only in respect to new houses, but in respect to the kind and situation of closets and the proper construction and disconnection of drains. Next with respect to the water supply, the usefulness of the Public Health (Water) Act was limited, inasmuch as it applied only to rural districts, whereas it should be made applicable to all districts, whether urban or rural, not provided with a public water supply. The disposal of refuse included three very important items in village sanitation, viz., closet accommodation, scavenging, and drainage. The water-closet which was found to answer best in districts where there was no public water supply was the simple pan-closet, with syphon bend and ventilating shaft, and he always recommended that the slop water be used for flushing purposes. Of course, this applied only to outside closets; where the water-closet was inside the house, it should be provided with proper cisternage and other appliances. But even when the closet accommodation was of a kind to satisfy all reasonable sanitary requirements, cleanliness of the surroundings could not be maintained without due attention to scavenging. He was of opinion, however, that for the great majority of villages public scavenging was not only unnecessary, but to insist upon it was unreasonable. But there still remained the serious difficulty of satisfactorily disposing of the slops and refuse water, and in villages of any size this implied a system of drainage of some sort, which would depend in a great degree on local circumstances. But suppose a village was fairly well drained, or required to be well drained, how was the sewage or slop water to be ultimately treated? That also depended much on local circumstances, but in whatever way the slops were ultimately disposed of they required to be conveyed by one or more outlets to a safe distance. In conclusion, Dr. Wilson expressed the opinion that medical officers of health should be trained men and debarred from private practice, while surveyors and sanitary inspectors should hold certificates from the Sanitary Institute or some other examining body as to their fitness to discharge the duties required of them. Extended legal powers were also required for rural districts.

SANITARY HOUSES FOR THE WORKING CLASSES IN URBAN DISTRICTS.

Mr. H. Percy Boulnois, M. Inst. C.E., Borough Engineer of Portsmouth, read a paper on this subject. He described the requirements of a house which could be built at a very moderate cost, suitable for the habitation of the working man and his family, and within his means, and at the same time be as sanitariously perfect as modern science would admit. The site should be clear of all filth; it should not be an old refuse-tip, and if marshy it must be drained. The whole of the site of the house within its walls should be covered with a layer of cement concrete, 6 in. thick, to prevent the ground air rising into it. No basements should be allowed. The external walls of the house should be constructed hollow, by means of two 4 in. walls, with a space of about 2½ in. between, proper damp-courses of asphalt or slate being provided. The house might contain either four or six rooms. In the former case the ground-floor would have parlour and kitchen, the upper floor two bed-rooms; in the latter the kitchen could be built as a tenement wing at the back, with a small bedroom over it. The height of the rooms should be 8 ft., the windows being sash-hung and opening at the top, and if any special means of ventilating the rooms could be introduced which would be beyond the tampering powers of the inmates, so much the better, if it did not make the rooms too cold or draughty. One favourable means of good and cheap ventilation was by a simple construction of the fireplace, the back and sides being made hollow, with air-bricks on the floor-level, the fireplace itself being merely formed by three or four iron bars built in across the front. Great care should be exercised, in laying the floors, that the battens should be close jointed. Open joints were highly unsanitary. The walls of the rooms should be painted or discoloured in bright, cheerful colours. The roof of the house should be flat, covered with cement concrete and a thin coating of genuine mastic asphalt. This flat roof could be approached from the top landing by a flight of easy steps or stairs. Not only did such a roof give a more even temperature to the rooms under it, but it afforded a ready escape for the inmates in case of fire. It was cheaper of construction than an ordinary slated or tiled roof, and it served as a pleasant place for recreation or even as a garden or drying ground. At the back of the house there should be a court-yard paved with asphalt, not the usual nondescript inclosure called a "garden." Plenty of air-space should be provided in front of the house. Upon the back yard should open the doors of the wash-house, the water-closet, &c. No fixed dustbin should be allowed: fixed dustbins, except for large establishments, were a dangerous nuisance, as they were difficult to empty and clean. The water supply for flushing must be ample, and come from a sufficient height, and through a 1½-in. pipe at least. The main sewer should, if possible, be at the back of the house for two important reasons; first, because the drain need not then pass under the house; and secondly, that of economy, as less length of drain was required. If it were unavoidable that the drain should pass under the house, then it must be completely surrounded by good cement concrete. The sink in the scullery or kitchen should be one of the many glazed stoneware patterns to be seen in the Exhibition, not of stone or cement; and the pipe leading from it should empty into a pit covered with a grating and provided with a syphon, or, still better, to a simple form of grease-trap, which could be purchased for a few shillings. The rain-water down-pipes must also empty themselves on to or near open gratings, and must on no account be connected directly with the drain. The water supply should be constant, but if it were unfortunately intermittent then the cistern must be placed in such a position as to be easily seen and cleaned. The above requirements for a sanitary house were perfectly simple and not prohibitive of the strictest economy. A change was, however, required in the present machinery and manner of the inspection of dwellings in course of erection, and until a larger staff of inspectors or sanitary police were employed little real advancement would be made in the sanitation of buildings.

In the course of the discussion which followed, Professor Sir Henry Acland, K.C.B., M.D., after expressing his sense of the value of the papers which had been read, said he quite agreed with an opinion expressed by Dr. Wilson as to the

desirability of instruction being given in Sanitary matters in our Board Schools. It was not by State compulsion that people were to be kept clean, but by the influence of knowledge on personal character.

Sir Robert Rawlinson agreed with Sir Henry Acland that sanitary improvements must be a matter of education and not of State compulsion, and said he must appeal to the ladies, for this was a question on which female knowledge must come to the front. As regarded extravagance, he had sanitary plans and estimates come before him every day of his life. He had to look them over, and he found that, instead of sanitary works being carried out with greater economy or cheapness than formerly, he was staggered at the extravagance shown; he was appalled at the estimated sums for drainage. These Local Boards were independent in a measure in their action. After the central Board had sanctioned a scheme the Local Board had perfect control, and the gentlemen elected to look after the interests of the ratepayers were often either ignorant of their duties or they were careless. The works were left to the contractor; the local surveyor did not attend to his duties, and over and over again the estimates were exceeded one-third, one-half, and sometimes doubled.

Dr. Thursfield (Shropshire) observed that good water was often to be obtained by sinking wells, but frequently no trouble was taken in finding the best sites; easy access was the only thing considered.

Dr. Woodford (Berkshire) spoke of the importance of imparting sanitary instruction to the poorer classes.

Dr. Carpenter remarked that it was perfectly useless to have by-laws for sanitary regulations unless the people could be made to understand the objects for which those regulations were carried out.

Sir Thos. Acland, M.P., said if he had learned anything it was that great progress had been made in the minds of those who were sanitary workers, and that they were looking now to what was the fundamental work to be done, viz., educating the people. He wanted, however, to see a statutory enactment that all officers of health and inspectors of nuisances should have an educational qualification.

Dr. Sanders (Herts) thought the time had come when an amendment of the Public Health Act should be obtained.

Dr. P. Nunn (Bournemouth) was of opinion that one of the practical points to be considered by that Conference was as to whether power could not be obtained to buy land compulsorily on which to erect labourers' cottages.

Dr. Dudfield observed that there were forty medical officers of health in London, and he thought that was sufficient. These officers should be paid adequate salaries to enable them to dispense with private practice. He wished there was power to compel sanitary authorities to do their duty.

The Chairman, in some concluding observations, said he did not see any reason why living in flats should be unhealthy. Much as he had advocated fire-places for purposes of ventilation, he thought some arrangement might be advantageously made by which fire-places could be got rid of in large blocks like the Peabody buildings. He thought that if sanitary officers would exercise the powers they possessed in an intelligent manner there would be very few insanitary houses in England.

At the meeting of the Conference held on Wednesday last, Dr. Bristowe read a paper on "Industrial Diseases." A report of this is deferred.

INTERNATIONAL CONFERENCE ON EDUCATION.

The Executive Council of the International Health Exhibition have determined to hold an International Conference on Education in connexion with the Education Division of the Exhibition: they have appointed a committee of management, who have drawn up the following programme. For convenience of discussion, all papers to be read will be printed beforehand, and they will subsequently be published by the Executive Council.

Persons desirous of attending the Conference are invited to send in their names to Mr. R. Cowper, secretary to the committee of management, International Health Exhibition, South Kensington, to whom any inquiries can be addressed.

The following is the order of subjects to be treated:—

1. *Conditions of Healthy Education.*—Under this head may be included the consideration of the structure, fitting, and equipments of a school; gymnastics and other physical exercises; the right apportionment of time to different subjects of instruction in schools of various classes; the indirect effect of pictorial or other decoration in improving the taste and cultivating the imagination, and in increasing the scholars' interest in their work.

2. *Infant Training and Teaching.*—(a) Kindergarten; (b) Instruction generally. Under this head may be included the right structure of schools and class-rooms for very young children; the apparatus needed for play and for instruction; the exercises, mental or manual, best fitted to awaken the faculties; the distribution of time; pictures, decoration, collections of objects, &c.

3. *Technical Teaching.*—(a) Science; (b) Art; (c) Handicrafts; (d) Agriculture; (e) Domestic Economy. Under this head may be included:—(a) methods of teaching the different branches of physical and of natural science, the equipment of school laboratories, the value of experimental work by pupils, the organisation of evening science classes and of science schools, the connexion between the teaching of pure and applied science; (b) the teaching of drawing and of colouring as a preparation for designing and decorative work; (c) the value of special and general workshop instruction in elementary, higher, and evening schools, the equipment of school workshops; (d) the teaching of agricultural science in elementary, in intermediate, and higher schools, in technical schools, in special colleges, and in the universities, methods of teaching experimental farms; (e) methods of teaching cookery in schools, &c., by book lessons, by demonstrative lectures, and in school kitchens.

4. *Teaching of Music in Schools.*

5. *Museums, Libraries, and other Subsidiary Aids to Instruction in connexion with Schools.*—Under this head may be included the means of establishing and managing school libraries; the promotion, with the help of the scholars or otherwise, of museums of art and science, illustrative of the local fauna, flora, industry, history, archaeology, &c.; school savings banks; botanical and other field excursions; visits to picture-galleries and museums; voluntary evening classes for singing, recitations, &c.; and generally the means of connecting the influence of the school with home life and self-improvement.

6. *Training of Teachers.*—Under this head will be considered the right professional preparation for teachers in (a) Elementary; (b) Intermediate and Higher; (c) Special and Technical Schools. The relative advantages of training in special institutions and in colleges for general education. Normal colleges, their constitution, conditions of admission, programme of studies; apprenticeship; model and practising schools; universities and their relations to the training of teachers; professorships and lectureships on education; examination for diplomas and certificates; legal recognition of such diplomas and certificates; registration of teachers.

7. *Inspection and Examination of Schools.*—(a) By the State; (b) By the Universities; (c) By other Public Bodies.

8. *Organisation of Elementary Education.*

9. *Organisation of Intermediate and Higher Education.*

10. *Organisation of University Education.*

11. *Systems of Public Instruction in Various Countries.*

THE HOUSING OF THE POOR.

SIR,—In your impression of the 17th May [Supplement, p. 735], you refer to my drawings and the omission I have made in not stating the cost per room, although giving other figures in detail. The estimate of 2,250*l.* per block was calculated at 42*l.* per room, being the cost at which I erected a similar three-story building by contract at Bethnal-green twelve months since.

The note on the drawings, and to which you also refer, viz., "That buildings of three or four stories can be built more economically than lofty structures," I admit is a bold assertion to make, but one that can be maintained by figures. The average cost per room in lofty structures, such as the Improved Industrial Dwellings Company, is 50*l.* This extra cost is incurred by the increased thickness of the brickwork to all walls. The required thickness for a three-story building is 14 in. to the lower story and 9 in. above, whereas one of six stories requires 18 in. at the base and 14 in. to all the floors above, with a proportional increase to divisional and other walls. This gives an increase of one-third upon the large item of brickwork alone, in addition to which there is the extra cost of window linings and other matters which would not be required in 9 in. work; also a loss of floor-space, and as it is necessary that these buildings should be erected at the smallest possible cost to allow the rooms to be let at low rentals, attention to detail of this description is of the utmost importance. Taking my return of 5*l.* per cent. upon the outlay for a three-story building, had the height been increased to six stories the cost and return would be as follows:—

Cost.—108 rooms at 50 <i>l.</i>	25,400
Land same as for three-story building.....	2,875
Extra land required upon increased height to admit of equal amount of light and air, 70 ft. by 10 ft., at 3 <i>l.</i> 3 <i>d.</i> per foot.....	113
	28,385
Return.—108 rooms at 2 <i>s.</i> per week.....	10 16 0
Rent from workshop.....	0 6 0
	11 1 0
	52
Per annum.....	574 12 0
Outgoing.—As stated on my drawing at 117 <i>l.</i> 10 <i>s.</i> , but which in this case would be doubled.....	235 0 0
	439 12 0

or 5*l.* per cent. only, or a loss of $\frac{1}{2}$ per cent. upon that of a three-story building. Another fact in favour of my assertion is the case of ordinary small dwelling-houses. A row of six-roomed cottages can be well built at 225*l.* each; but had these six rooms formed part of a lofty building, they would have cost 300*l.*

The object of my drawings is to show the possibility of erecting dwellings for the poor which can be profitably let at small rentals, without (to my mind) the very objectionable piling up of floor upon floor with the consequent inconvenience of lofty staircases, and the dismal and dreary appearance of the areas or courtyards debarring the sun from any chance of ever shining into the lower windows, the necessity of which has been so often pointed out by doctors and others. A room with plenty of daylight is more likely to be kept clean and free from dirt and filth than a dark one.

Another point which I claim in my drawings is the isolation of each block, which gives the sanitary authorities free control of all open spaces, and admits the periodical removal of the contents of the dust receptacle, without passing through the building, and also allows a free circulation of air to every part.

Much more might be said upon this very important subject, but I fear I have already trespassed upon your valuable space.

JOSEPH WALL, A.R.I.B.A.

In the article on "Dress" by "a Medical Man" in our last week's Supplement, some complimentary remarks were made as to boots made on anatomical principles, and which were exhibited in comparison with ordinary boots, and with a model of the foot. By an oversight of our contributor, the name of the author of this meritorious exhibit, Mr. F. Lanagan, was omitted; and as other names were given, we supply his now.

HEALTH EXHIBITION.

MR. RICHARD ANDERSON, F.C.S., author of "Lighting Conductors, their Theory, Nature, and Mode of Application," makes a Specialty of Testing the Efficiency of Lighting Conductors; and of giving Advice as to the best mode of applying the Apparatus for the Protection of Public and Private Buildings.—Leadhall House, 101, Leadhall-street, E.C.

Group III. Class XXII. South Annex. BATTEN'S PATENT SEWER VENTILATORS AND MAN-HOLE COVERS. No. 150, LOZELLS-ROAD, BIRMINGHAM. (See May 31, p. xxii.)

BECK & CO. (LIMITED), 130, GREAT SPILFORD-STREET, SOUTHWARK, S.E. STAINLESS, EASTERN PATENT VALVES, HYDRANTS, METERS, STREET BOXES, ROAD LING, PUMPS, PUMPS FOR HAND AND POWER. Patent Water Waste Preventing Cisterns and Water-Closets. Fire Extinguishing Appliances, &c.

Group III. Class XXV. No. 715, Central Annex. VENTILATORS FOR ROOFS OF HALLS, CHURCHES, SCHOOLS, HOUSES, DRAINS, SEWERS, &c. W. P. BUCHAN, S.E. { 2, Kentrev-street, Glasgow.

SEMI-VITREOUS WHITE and BUFF FACING BRICKS, of pure Terra cotta. GRANITE VITRIFIED FACING BRICKS, Buff and Grey, of pleasing appearance and enormous strength. CANDY & CO., Lim. { No. 11, Queen Victoria-street, W. & C. { No. 11, Queen Victoria-street, W. & C.

THE COALBROOKDALE CO., Lim. SHROPSHIRE AND LONDON (Holborn Viaduct). Stand 577, Class xxiv, &c., East Quadrant.

NO. 714, CENTRAL ANNEX. MEAKIN & CO. Baker-street, W. SASH PULLEYS, SASH FASTENERS, AND NEW PATENT SASH FOR CLEANING.

EAST GALLERY, STAND 660. W. M. WOOLLAMS & CO. Original Manufacturers. ARTISTIC WALL AND CEILING PAPERS free from Arsenic.

NO. 110, HIGH STREET, near MANCHESTER-SQUARE, W. GLAZED BRICKS.

Stand 660, East Central Gallery. The WORTLEY FIRECLAY CO., Eiland-road, Leeds. Only award to English makers at International Medical and Sanitary Exhibition, 1881.

YATES, HAYWOOD, & CO. (Lim.), No. 95, Upper Thames-street, London. PATENT IRON OVERMANTEL, SLOW AND FAST COMBUSTION STOVES.

The Builder.

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Iron Roofs.

LARGE number of excellent drawings and details of various kinds of roofs, principally such as are used for the covering of railway stations, have been brought together by the author of the work* published under the above title. In the preface he states that

"his object has not been to deal with methods adopted for the calculation of strains, which have already been well considered by many practical authors in standard works, but to provide a record of the style of design adopted in some of the best known roofs that have been erected." The task which the author set himself he has performed with great care and ability.

The book consists chiefly of plates, of which there are sixty-five, besides a large number of diagrams interspersed with the letterpress, illustrating the principles upon which various kinds of roofs are constructed. The letterpress does not contain any detailed description or explanation of the plates, which are left to tell their own tale; this they do with sufficient clearness for all the purposes of the experienced architect or engineer, but, for the benefit of students, a somewhat fuller explanation of each plate would have made the work more valuable as a book of reference.

The employment of iron in the construction of the principal of roofs may be almost said to have been introduced by the present generation of engineers, many of whom can remember the time when it was scarcely ever used in those structures except in the form of bolts and straps to hold together the several timbers. It first began to take the place of wood in the parts that were in tension, such as king or queen posts and tie-beams, for which wrought-iron was used, while the heads of the kings or queens were made of cast-iron for the heads of the rafters to frame into. Later on we find cast-iron employed for the struts which were in compression, the same material being also used for shoes to receive the feet of beams. Afterwards, when iron came to be rolled of various sections, it was found convenient to have every part of the roof of wrought or rolled iron, although even in the present day

we find cast-iron sometimes used in parts subject to compression only.

The author remarks "that many of the early iron roofs closely resembled the form of construction adopted for ordinary timber trusses," and an illustration of this is given in the iron roof of the House of Lords, which is a combination of wrought and cast iron. It was, however, soon found that other arrangements of the parts were better suited to the material employed, and the tie-rod, instead of being horizontal throughout, was generally made to slope upwards towards the centre, so as to give a greater clear height to the interior of the building. A strut was placed at the middle of each rafter and at right-angles thereto, a tie-rod being attached to each end of the rafter and the lower end of the strut, so as to form a kind of inverted king-truss, while a horizontal tie between the ends of the struts completed the truss. It is on this principle that most of the iron trussed roofs have been and still are constructed, the number of struts and braces being increased with the increase of span. As an example of a large roof of this description the author gives the details of that over the Exeter station, erected about twenty years ago, the span of which is 132 ft.; the struts in this case are of cast iron. The cost of this roof is stated to have been about 16l. 10s. per square, while that of a similar roof of half the span was only 9l. per square, it being generally found that the cost per square increases with the span.

In curb roofs, which have four instead of two principal rafters to each truss, the same method of stiffening the rafters is adopted, a strut being placed at the middle of each with tie-rods connecting it with the ends of the rafters, and cross-ties connecting the two sides together. An example of this form of roof is given by the author in drawings of that over the North-Eastern station at Leeds, of which the span is 89 ft.

In the illustrations of the Bristol Station roof, we find an adaptation of the above-named principle to a roof having curved rafters. The span here is 125 ft., and the rafters are formed as lattice girders, 2 ft. deep, with a curvature of which the versed-sine is 4 ft.; there is only one strut, which is placed in the centre of each rafter with a tie at each end, and a suspension-rod in the middle holds up the centre of the tie-rod, which rises 10 ft. above the springing. This roof was built on a curve, and the cost was 37l. 16s. per square, measured on plan. Where the span of a roof is very great it is found advantageous to have one continuous rafter in the form of a circular segment, which is stiffened by vertical struts attached at their lower ends to the tie-rod, and between these is fixed diagonal bracing to hold up the tie-rod

and keep the struts in compression. This form of roof is known by the name of the "bowstring" principle, and is seen in that over the New-street Station at Birmingham, of which the span is 212 ft., erected in 1854 at a cost of 17l. 15s. per square. The Cannon-street Station, in London, is another example given by the author, the span of which is 190 ft., built at a cost of 49l. 10s. per square. That over the Charing-cross Station is also on the same principle, with a span of 186 ft., the cost of which was 40l. per square.

The bow-string principle was also adopted in the construction of the Lime-street Station at Liverpool, erected about ten years ago, of which Mr. Walmisley gives the details. In this roof the "boom" is a curved girder of I section 14½ in. deep, having a rise of 42 ft. with a span of 212 ft. The depth at the centre to the tie-rod is 20 ft., and the boom is stiffened by twenty braces forming a series of Vs, each brace consisting of four-angle irons with cast-iron distance-pieces to give them an outward swell in the middle; these are attached to the tie-rod by means of bolts. The cost of this roof was 30l. per square.

A form of principal frequently adopted in station roofs, consists of sloping rafters with a tie-rod across from foot to foot, with vertical struts and diagonal bracing between the rafters and tie. The roof of the Broad-street Station of the North London Railway, erected in 1865, is an example of this type, the span being 95 ft. The station at Preston has a similar roof with a span of 77 ft. In the London Bridge Station of the Brighton Railway, the same principle is employed with a continuous curved rafter, having a span of 88 ft.

A method which is sometimes employed in roofs of considerable span consists in placing horizontal lattice or Warren girders horizontally across from wall to wall, and covering them with a series of "ridge-and-furrow" roofs of small span. This plan was adopted in the Exhibition building at Hyde Park in 1851, and has also been employed for a roof of 114 ft. span over the Bridge-street Station at Glasgow, which is carried on nineteen Warren girders placed 31 ft. 6 in. apart, and having a depth of 12 ft. The cost of this roof and the covering was 22l. 5s. per square. The roof of the Central Station at Glasgow is also on this system, being carried on seventeen lattice girders spanning the whole width of 213 ft. 6 in., having a depth of 20 ft.; these are braced longitudinally with diagonal braces attached to horizontal lattice girders, which carry the gutters. The covering is formed of ten spans of ridge-and-furrow roofs; and the cost was 28l. 17s. 6d. per square. Another roof built in this way is that of the Citadel Station at Carlisle, which is carried on twenty-four girders

* Iron Roofs. By A. T. Walmisley, Assoc.-Mem. Inst. C.E. London: E. & F. N. Spon, 1884.

of single lattice pattern, 15 ft. deep, and of various spans, the longest being 154 ft. In this case the ridge-and-furrow covering runs parallel with the supporting girders.

The class of roof to which modern engineers appear to be most partial is that in which the principal consists of an arched rib of sufficient depth to carry the load of the covering, and formed either with a solid web or with open lattice work. As all arches have a certain amount of horizontal thrust outwards at the springing, it is necessary to secure the feet of the curved rib from overturning the supports, either by placing ties across, as in the bow-string principle, or by giving sufficient solidity to the abutments. Where the supporting walls or piers are carried up to a considerable height it is difficult to give them sufficient strength to resist the thrust of an arched roof of wide span, in which case it is usual to introduce a tie-rod across to secure the ends of the rib from thrusting on the walls. This tie-rod is held up to the rib by light suspension-rods, and no bracing or strutting is required, as the rib itself has sufficient strength to carry the load. An example of this kind of roof is seen in that over the Victoria Station of the London, Chatham, and Dover railway, having a span of 129 ft. The arched rib in this case is formed as a lattice girder, 4 ft. deep, with a rise of 32 ft. in the centre; the tie-rod being held up to it by fifteen suspension-rods, and its centre being 8 ft. 6 in. above the springing line. A similar form of roof is employed to cover the Central Station at Liverpool, where the main ribs are 160 ft. span, with a rise of 40 ft., the tie-rod 14 ft. in the middle. The main ribs are 55 ft. apart, and connected by lattice purlins, which support five intermediate ribs. Another roof of this type is that over the Queen-street Station at Glasgow, having a span of 170 ft. The rise of the ribs is here 44 ft., and of the tie-rods 14 ft. 9 in., the latter being held up to the ribs by six suspension-rods. Each rib is latticed on the Warren principle, and is 4 ft. in depth. The cost of the roof and covering was 21l. per square.

Wherever a good abutment can be obtained for the arched rib, it is usual to dispense with the tie-rods, as in the roof of the Metropolitan Railway Station at High-street, Kensington, which has a clear span of 90 ft., the ribs being elliptical, and formed as solid plate girders, 16 in. deep at the centre, and rising 29 ft. above the springing. This station being in a cutting, no extra expense was incurred in providing sufficient abutment to the arch.

The largest single-span roof on the arch principle that has been erected is that over the St. Pancras Station of the Midland Railway, which the author has illustrated by four plates. Each rib of this roof is in the form of a four-centred or Tudor arch, having a clear span of 240 ft., and a rise at the centre of 96 ft. It springs from the level of the platform, the thrust being chiefly taken by the heavy brick piers on which the feet are secured by means of anchor-plates and strong bolts carried down to the foundations. As an additional precaution to prevent any dangerous thrust on the walls, the main floor girders which carry the platform and rails are made to form a continuous tie between the feet of the rib. The construction of the rib is that of a lattice girder, 6 ft. in depth. There are twenty-five of these main ribs in the roof, placed 29 ft. apart, with trussed purlins between them, which carry the intermediate ribs. The upper part is covered with ridge-and-furrow roofing, which runs parallel to the main ribs. One of the most remarkable features about the erection of this roof was the timber scaffolding employed to raise each rib into its place. This consisted of a travelling stage dividing the span into three parts, the side stages having five and the centre six divisions each, and four divisions in each stage from back to front. The first staging travelled on 123 wheels, 2 ft. 8 in. diameter, running on a beam of timber 18 in. square. The cost of this roof was 31l. 10s. per square.

Another roof of similar type is that over the St. Enoch Station at Glasgow, in which the rib is elliptical, or nearly so, and has a span of 198 ft., with a rise of 80 ft. Each rib is 5 ft. in depth, and is formed as a Warren

girder, being secured at the feet to a base-plate which is carried under the platform for about 13 ft., and is anchored down with strong bolts. There is also a similar roof over the Central Station at Manchester, with a span of 210 ft. and a rise of 85 ft. The roof of the Drill Hall, Derby, is also made on this principle, the ribs, which are 2 ft. deep, springing from the level of the ground, and having a span of 75 ft., with a rise of 30 ft.

The station at York is 234 ft. wide, and is built on a curve in plan. It is covered by four elliptically-arched roofs of unequal span, resting on three rows of iron columns 18 ft. high. The outer walls have strong buttresses to resist the thrust of the arches, of which the widest has a span of 81 ft. with a rise of 27 ft. The covering of the upper part is on the ridge-and-furrow system. Where the springing of an arched rib is raised to a considerable height above the ground, it is necessary to give it as much as possible the stiffness of a horizontal girder, so as to reduce to a minimum the outward thrust. In the roof of the Crystal Palace, at Sydenham, which has a span of 104 ft., this has been done by making the semicircular ribs 8 ft. in depth, and forming them of double lattice work; also any horizontal thrust that might arise is transmitted by means of a cast-iron framework to a system of columns connected by girders and braces, which renders the whole structure perfectly rigid. In the Agricultural Hall at Islington the roof is formed of latticed ribs, having a span of 125 ft., and rise of 51 ft., which rest on a double row of braced columns, forming a base of sufficient width to resist the thrust of the ribs, which is conveyed through the gallery girders to the outer walls. The roof of the Paddington Station of the Great Western Railway, which is 240 ft. wide, is formed in three spans of segmental ribs, the centre one having a span of 102 ft. with a rise of 33 ft. 9 in.; the depth of the ribs increases from the centre towards the springing.

The Middlesbrough station is covered by two unequal spans of curved ribs forming pointed arches, the larger one being struck with a radius of 42 ft., and having a depth of 2 ft.; these ribs are formed of open lattice work.

Iron is frequently employed in the construction of domed roofs over circular or elliptical areas. That over the British Museum reading-room, built in 1857, is circular on plan with a span of 140 ft. and a rise of 106 ft.; and consists of twenty circular iron ribs meeting at the top in a circular ring 40 ft. in diameter. The ribs spring from the top of cast-iron stanchions, and the space between them is filled up with brickwork.

The Albert Hall at Kensington is covered with a domical roof of a different type. This building is elliptical on plan, the length being 219 ft. and the width 185 ft. The roof is formed of thirty half-principals springing from a continuous iron curb laid on the top of the wall, and meeting at the centre in an elliptical ring. Each rib is a girder with curved top and bottom flanges meeting at the end which rests on the wall, and having a depth of 17 ft. 9 in. at the summit, the rise of the lower flange being 33 ft. above the springing. Each half-principal is divided into seven bays by struts with cross bracing between. There are seven rows of latticed purlins fixed all round the roof between the principals.

The largest dome that has ever been built is the wrought-iron roof of the Vienna Exhibition, designed by the late J. Scott Russell, and erected in 1873. This building is circular on plan, with a clear span of 343 ft., the height from the ground to the springing of the roof being 80 ft. The roof is conical, and slopes at an angle of 30 deg. to the horizon. It is constructed of rolled plates riveted together, the lower edge being strengthened by a wrought-iron curb in the form of a continuous box girder. At the top of the cone there is an opening 100 ft. diameter, on which is another curb surmounted by a drum 34 ft. high, on which is another cone of plate-iron supporting a lantern. The entire cone is stiffened with lattice-girders running from curb to curb up the side of the cone, with ring-girders at intervals laid parallel to the curbs. These

girders and rings are placed outside the cone. In this mode of construction there is no outward thrust upon the supports.

In the construction of iron roofs it is very important that great care should be taken in forming the joints of the various parts, as the fracture of a single bolt might endanger the whole structure. The author has given numerous examples, drawn to a large scale, of the modes of connecting the parts of roofs, which will be of great value to the designer of these structures; but we think that some further description of these matters might have added to the utility of his book. The common mode of fixing the ends of the tie-rod to the feet of the rafters is by means of a round bolt passed through both of them; thus in the roof of Bristol Station the tie of a roof, 125 ft. span, depends entirely on the shearing strength of a single pin, $3\frac{1}{2}$ in. diameter; and in that of Exeter Station having a span of 132 ft., it is held by a bolt $3\frac{1}{2}$ in. diameter. In the roof of Swansea Station, with a span of 64 ft. 6 in., the tie is held by a pin only $1\frac{1}{2}$ in. diameter. The end of the tie of the Cannon-street Station is held between two plates by means of key-wedges, so that it can be tightened up if necessary, the plates being secured to the foot of the rafter with fifteen $\frac{1}{2}$ in. bolts; and in the London Bridge Station of the Brighton Railway the same method is adopted, as well as in that of Lime-street, Liverpool. Where the tie-rod is in several lengths, as is the case with all large roofs, the ends are united either by being screwed into sockets, or else by bolts passed through them, the ends being widened out to receive the bolts. The screw-joint has the advantage of allowing the tie to be tightened up when necessary. The ends of struts are fixed to the rafters with bolts or rivets, and are either bolted directly to the tie-rod or else to a plate attached to the screw-socket above mentioned. Suspension-rods are bolted to the web of the rafter and passed through the tie-rod with nut and screw to tighten them up. Braces are generally bolted to the rafter, and also to a plate attached to the tie-rod; but in some large roofs they are fitted with key-wedges or screwed into sockets so as to allow of tightening.

In roofs of large span which have tie-rods, one end is generally laid upon rollers to allow for expansion and contraction by change of temperature. In the roof of Exeter station, of which the span is 132 ft., it was found, however, after some time had elapsed, that the rollers had never moved, and might have been dispensed with. In arched roofs without ties it is impossible to leave one end free, consequently the only way in which they can expand is by rising at the crown.

One great drawback to the use of iron for roofs is its liability to corrosion and decay, especially in the case of wrought iron, so that a few years of neglect might cause the strongest framework to fall to pieces. Numerous methods have been devised for preventing decay, that of galvanising being very largely used; but this process is said to render the iron brittle. The most efficient protection for iron appears to be that of coating it with magnetic oxide by exposing it to a current of highly-heated air. This is known as the Bower-Barff process. Even this protection, however, seems to fail where the metal is subjected to severe strains, which cause the coating to peel off from wrought iron and steel, although it answers very well for cast iron.

Mr. Walmisley is of opinion that "oiling is a very much better protection from the effects of the weather or the action of steam than painting, but care is needed properly to clean off the black scale or oxide formed upon the iron by contact with the air immediately after leaving the rolls."

A process is said to have been recently invented of rendering iron rust-proof without diminishing its strength, by alloying it with other metals, as copper and zinc, which perhaps may revolutionise the whole system of iron working. The discoverer of any efficient process of preserving iron might certainly be regarded as a benefactor of the human race.

RAILWAY SHAREHOLDERS AND
THE NEW RAILWAY REGULATION
BILL.

THE Government Bill for the Regulation of Railways has aroused, as our readers will probably not be surprised to hear, a like amount of uncompromising opposition from the railway interests on the one hand, and from the manufacturers and freighters on the other. A meeting convened by the "Association of Railway Shareholders" was held at the Cannon-street Hotel on the 5th current, Lord Brabourne in the chair, to consider the Bill. It is not clear to what extent the 400,000 Railway Shareholders in England and Wales (as Lord Brabourne estimates the number) are represented by this association. The chairmen of the great railways have not given their support to the organisation, having, indeed, an association of their own. On the other hand, the chairman of the meeting referred, in not the most cordial tone, to "another society of the same name which invariably followed in their wake after they had a large meeting"—the object of which, he believed, was "to obtain the more efficient control of directors by the shareholders." Placed between the two opposing forces of the railway directors, represented by their Chairmen, on the one hand, and of the shareholders who seek to establish a more popular control over the policy of the companies on the other, Lord Brabourne fails to come forward as the authorised spokesman of the railway interest. At the same time, the arguments of the speakers on the occasion deserve attention from their own weight, as well as, to some extent, from that of those who urged them. Lord Brabourne "for four years had not been a party man, because he saw laws brought forward tending to dislocate the rights of property." After referring to the Irish Land Act and the Shipping Bill as illustrations of this position, he moved a resolution to the effect that the Railway Regulation Acts Amendment Bill will unjustly alter the conditions upon the faith of which capital has been subscribed by the public for the construction of railways, unduly depreciate railway property, and deprive shareholders of the protection of the ordinary courts of law which is enjoyed by all other commercial bodies.

All the speakers agreed in deprecating any political feeling in the matter; although the view of the necessity of a firm and resolute defence of the rights of property was distinctly recognised by the meeting. Sir Edmund Beckett attributed to the mutual jealousy of railway managers their failure "to take part, as they ought to do, in a thing of this kind." As to this, it may be desirable to hear the opinion of the managers themselves.

Of the abstract correctness of these views few honest men can make any doubt. But the real point is how far are the speakers justified in their application to the Bill under discussion? Coming to particulars, the main point appears to have been made by Lord Alfred Churchill, in the remark that a superior court of three Commissioners, only one of whom was a lawyer, was not likely to give confidence either to railway companies on the one side or to the public on the other. In this remark there is great justice. Why the interests of the holders of 600 millions worth of shares (to say nothing of loans, debentures, and the like), on the one hand, and of the public, regarded as a travelling and freighting body of persons, on the other, should be withdrawn from the jurisdiction of the educated magistrature of the country, and subjected to that of a sort of amateur court, may well be questioned. Considering the education obtained by counsel in their practice on railway causes, it is quite untenable to assert that it would be difficult to find perfectly competent judges, within the ranks of the legal profession, for an exclusively railway tribunal. To render permanent a railway court of justice, with judges who should be lawyers, and, if necessary, with an engineer for an assessor, would obviate the opposition raised to Parts I., IV., and V. of the Railway Bill; and a measure limited to

this extent would probably command a very large degree of public support.

With regard to Parts II., III., V., and VII. of the Bill it is impossible to admit for a moment that at the present period of the session, and, under all the circumstances, which exert such a pressure on the time at the disposal of Parliament, it is possible adequately to discuss provisions of so much importance. The powers which it is proposed to add to those already exercised by the Board of Trade are justly regarded with apprehension by the railway shareholders. The haste with which the Bill has been drawn up becomes painfully apparent on comparing clauses 21 and 26. The second of these applies to the terminal charges of a canal, the existing provisions of section 16 of the Act of July, 1873 (36 and 37 Victoria, cap. 48). The first of them alters the power of the Railway Commissioners under that clause. A bungle of this nature can, no doubt, be rectified in Committee, but its presence in the Bill as presented to Parliament is not calculated to win support for the measure as a whole. What, however, is of the most importance to the public at large is to be enabled to understand the true import and range of that extension of the powers of the Companies to make charges for "station terminals" which, in a confused and unbusiness-like manner, is half admitted by clause 21, and half remitted to the decision of the next ensuing Parliament.

Under the head of "Station Terminals" the representatives of the English Railway Companies propose to introduce a change in the rules for the charging railway freights which would, if duly carried out, be no less than a revolution in the carrying trade of the country. The claim on the part of the companies was distinctly put into shape by Mr. Grierson, the manager of the Great Western Company, before the Select Committee on Railways (rates and fares), and will be found on page 629 of their Report, part I. Put in plain English, Mr. Grierson asks for the power of charging 3s. a ton on all merchandise carried by Railway Companies "for station accommodation other than loading and unloading," that is to say 1s. 6d. per ton at each end of the line, irrespective of the lengths of journey." Two arguments are urged on behalf of this claim; one is that whatever be the length of haul, or distance for which the merchandise is conveyed, the expenses at the stations will be the same. The other is that the companies have recently laid out such immense sums of money in enlarging and improving their stations that it is just that they should be allowed to make an extra charge on that account.

As to the first argument, it is clear that as matter of distribution of costs, the case is as the companies represent it. It is also clear that there is no novelty in the fact. Such distribution has always existed, and it has been with full knowledge of the fact that, from almost the earliest days of the railway system, every pound of capital has been raised, and every railway Act of Parliament obtained. The main condition on which 800,000,000l. has been found for our railways has been that the charges to be made, both for freight and for passengers, should be rated at so much per mile. And much attention has been given to insure the provision that railway charges shall be alike, both as between different towns, and as paid by different freighters.

How far this general condition, undertaken by the railway companies as public carriers, would be overthrown by the admission of the claim for terminals, is illustrated by a single fact. The average receipts of the English railway companies for every ton of merchandise carried by them in 1873 was 5s. 6d. The addition to this mileage payment of the proposed 3s. for terminal charges would thus be equivalent to raising the whole freight charge of the railway companies throughout the kingdom by 54½ per cent., or from 5s. 6d. to 8s. 6d. per ton.

It is quite true that the managers will reply that they will take care only so far to exercise their new powers (when they have got them), as "the traffic will bear." But the answer to that is, that it is precisely that discretion on

the part of the companies to the exercise of which every freighter is most strongly opposed. For example, it is in evidence that the companies have found that the traffic in foreign cattle and foreign vegetables "will not bear" the charges which they are authorised to make, and which they do make on the transport of English cattle and English vegetables; and accordingly, in order to secure this foreign traffic, they have lowered the charges on the former. This is, in effect, giving a differential rate against the English farmer and the English agriculturist, to which the latter very strongly object, as is natural. From our own point of view such a differential charge is equally opposed to public policy and to the interest of the railway shareholders themselves. That every description of traffic should pay, not only its working charges, but its own share of the interest on capital in proportion to the time during which it occupies its share of the lines and stations, is the elementary principle of railway prosperity. A return to, or rather the adoption, for the first time, of that sound rule, would raise the dividends of the English railways, within a calculable period of time, to from 8 to 10 per cent. per annum. From a table given on page 233 of the Report of the Select Committee on Canals of last Session it appears that, allowing 4½ per cent. interest on capital, the average cost of every ton of merchandise carried for one mile on the English railways is 1-31d., viz., 0-53d. for working expenses, and 0-78d. for interest on money. Any charge that is lower than this must either reduce, as far as its influence extends, the moderate rate of dividend quoted, or be thrown on some other portion of the traffic to make it up. Against this the freighters protest. They demand, and, according to the principle on which all railway legislation has hitherto been conducted, rightfully demand, equality of charge. That one kind of traffic may bear a higher freight than another they all admit. That is so because its actual cost is more. But that the carriers ought to be the sole judges of the distribution of charges every freighter denies, as all our legislation as to common carriers has to this time virtually denied. Hops may cost more or less to carry, per mile, than pottery, or "hollow ware." But whatever is the price at which the South-Eastern Company can carry hops from Dover to London should be the hop dealers contend, an equal charge all round. It should not be one charge for French hops and another for English hops. It may be the case that it really costs the company more per cwt. per mile to carry hops from Canterbury than from Dover, because the charges come to less per mile for a longer than a shorter distance. If the companies wish to have a corresponding change in their tariff legalised, the freighters would not object, provided the change were so effected as to weigh fairly all round. Thus a charge of 3s. per ton comes to 0-36d. per ton per mile for a run of 100 miles, and to 0-72d. per ton per mile for one of 50 miles. Supposing the Parliamentary rate to be 3d. per ton per mile over the whole line, that rate has hitherto covered the fixed charge. If the companies now wish to exact that fixed charge independently in each case, what the freighters say is that an equivalent must be deducted from the cost per mile. They object to a payment of 3d. per mile plus 3s. per ton. They say that if the latter fixed charge is made, the running charge has to be reduced to, say, 2-44d. per ton per mile, or whatever the average length of line may show to be fair; and they say that such charge, if so altered at the request of the railway companies, shall be equally laid on every pocket of hops that they carry.

Of the fairness of this claim on the part of the freighter, and of its accordance with a true national policy, we apprehend that there can be no manner of doubt. Nor do we make any doubt that the adoption of such a hard-and-fast line is not only fair to freighters, and therefore to consumers, but also most advantageous to the railway companies. Taking the figures we gave before, a charge of 2-09d. per ton per mile all round would yield from the merchandise traffic (if there were no deduction for empties) a dividend of 8½ per cent. per

annum on the capital of each company. How far any particular item of transport, such as hops, might cost more or less than that mean of 2'69, is a proper matter for the investigation of the managers of the companies; and any fair determination, on that basis alone, would be cheerfully accepted by the freighters, so that all had fair play. To ask any company to carry anything at a loss is not business. The offer would be, or at all events ought to be, unhesitatingly refused; as when Mr. Robert Stephenson declared that he would be no party to robbing the London and North-Western Railway Company by holding any share in a contract for carrying Clay Cross coal over their line at a halfpenny per ton per mile. But at the same time the shareholders on the one hand, and the freighters on the other, have their rights. The former have the right to say to their manager, "You shall not carry minerals at halfpenny per ton per mile, unless you show us that the 61d. per ton, which we lose in consequence (as below the main cost of 1'31d.), is put upon some other article of transport." The hop merchant has the right to say, "You shall not put three farthings per ton on my hops to make up for the 61d. per ton that you choose to lose on the carriage of minerals." Thus, looking at all interests alike, the rule that each kind of traffic shall pay an equal proportionate profit,—equal, that is to say, to the demands that it makes on the earning powers of the line,—is not only the only fair, but also the only safe, policy, alike for the freighters, the shareholders, and the public. Any traffic that will not bear a charge of 1'31d. per mile should go by water. The adoption of this rule would at once set free the rails for the carriage of so large an increase of swift traffic, that the natural increment of trade, which is at least from 2 to 3 per cent. per annum, would soon raise the dividends of the railway proprietors to 8 or 10 per cent., while, at the same time, some 5 to 10 per cent. would be earned on the capital of the canals.

The other point as to which the claim of the companies for terminals is based, viz., the great outlay on the stations, cannot bear a moment's investigation. That outlay was either wise or unwise. If a wise outlay, it is a paying outlay, and there is an end of it. If an unwise outlay, on what pretext can the companies ask their customers to bear the burden? Mr. Grierson tells us (226, I., 1881) that the cost of the Smithfield Station has been so great that every ton of minerals carried there costs the company 3s. 8'71d. for terminal expense alone. The average gross receipt per ton of minerals on the Great Western Railway in 1878 was 2s. 6d. (the average on all the railways of the United Kingdom being 1s. 10d.). That means, that out of the freight which they charge for minerals, the Great Western Company (as far as the traffic of this nature is concerned) have to pay 3s. 8d. for terminals, plus all working expenses, and rates of interest for occupation of the line. Of course, it will be admitted that the coal that comes to London is charged more than the mean rate of 2s. 6d. per ton. But, on the other hand, a terminal station, of some kind, exists wherever coal is delivered on the railway; and the mean cost of terminal expense at a metropolitan station, a large town station, and a small town station (taking, as instances, London, Bath, and Evesham), is 2s. 2'7d. per ton, leaving only 3'3d. per ton for defraying the carriage for a mean distance of sixty miles. Thus when Parliament is asked to recoup the Great Western Company for their outlay on mineral stations, it may be well replied that, had the investment turned out a wise one, the public would have heard nothing of it; and that they can hardly be expected to pay for it on the sole ground of its unwise.

What Parliament may do with the Railways Regulation Amendment Act remains to be seen. That a superior Railway Court, with large powers, ought to be made permanent, most impartial men will agree. Nor do we think that there can be much dispute that the judges ought to be lawyers, of like experience and standing to other members of the Bench. That the question of terminals should be left

to this tribunal, under the actual provision of clause 15 of the Act of 1873, we think would also meet with general approval, provided that Parliament laid down for the guidance of the Railway Court the following principles:—First, that the general rates of charge on each line should not be increased by any new distribution of charge providing for the payment of a fixed charge for terminals; secondly, that no differential charges, as between home and foreign produce, should be permissible; and thirdly, that in sanctioning any new rate of charge, the actual cost of the traffic, plus the amount of interest due to the occupation of the line by its carriage, should be taken as the normal charge, and that it should not be permissible, in the case of any charge being reduced below such standard, to make up the loss of income by the infliction of higher charges (in proportion) on other kinds of traffic.

If, however, this fair and just principle were laid down for the guidance of the Railway Court, there is little room to doubt that the mutual jealousies of the companies would lead to the abandonment of the claim for terminals. For if the same rate of 3s. per ton were allowed all round, on such a line as the South-Eastern Railway, with a length of line of 334 miles, the incidence per ton per mile would be five times as much as on the London and North-Western Railway, with a length of 1,676 miles. However it was proposed to distribute the fixed charge, the proportionate difference between running and terminal charges would be so great as to lead to a confusion that has not been anticipated by the authors of the simple demand to add three shillings to the price of carriage of every ton of goods that is carried over every line of railway.

We have collected data from numerous foreign railways showing the real incidence of the terminal charges as to which the imperfect English returns leave so much in doubt. We have also ascertained what is the actual cost allowed by the great trunk lines for terminal expenses on their mineral traffic, where everything is cut down to the lowest fraction of a penny. But the length to which our preceding remarks on this important national question have already extended prevents anything further being said at present than the mere intimation of the existence of this analysis, the result of which is forthcoming when required.

PUBLIC WORKS IN EGYPT.

AMIDST the gloom which overhangs all our connexions with Egypt, it is a relief to find at all events one ray of light, and that amidst all the vacillation, weakness, and corruption which characterises the mismanagement of those immediately responsible for the government of that unhappy country, there is one strong man possessing energy, determination, and honesty of purpose, and who can pursue the even tenor of his way undisturbed by the continually-recurring changes in the political kaleidoscope.

The *de facto* Minister of Public Works, Colonel Scott Moncrieff is essentially a man of action, who, by a judicious admixture of tact and firmness, is not only gradually edging order out of the chaotic system which goes by the name of Public Works in Egypt, but is imparting some of his own energy to other departments of the State, for he is seemingly now the one authority to whom officials in Cairo turn for advice in their respective difficulties. In his own immediate department, however, it is not all smooth sailing, for the long-standing listlessness and corruption which has hitherto prevailed still meets him and hampers his endeavours at improvement. Aided by a staff of engineers with considerable experience gained in India, he has already introduced essential and important reforms, and the hitherto rough and unscientific system of irrigation works is being rapidly brought into a state of efficiency.

Whatever Nubar Pasha's shortcomings may be,—and, if rumour be correct, they are not few,—he, at all events, is shrewd enough to

recognise wherein Egypt's recuperative capability consists, and he has, therefore, contrived to keep his Public Works Minister supplied with a considerable sum of money, which, now that there is a certainty of its being honestly and judiciously expended, will speedily produce profitable results, and help in restoring the much-to-be-desired financial equilibrium.

The delta of the Nile resembles in all essential features those of the great Indian rivers, in which the magnificent systems of combined irrigation and navigation are in such successful operation. The main works on those rivers are the weirs, or, as they are locally termed "anicutts," by which the level of the river is raised from 12 ft. to 14 ft. and more in the dry season, and the water thrown into the main canals, from which the subsidiary branches spread fan-like over the whole Delta. This system of canals is so laid out that the irrigation lines shall not interfere with the drainage courses which have to carry off the surplus water after it has done its duty on the fields, while the distinguishing characteristic of a delta river being that it runs on the crest and not in the trough of the country, and that at the season of high floods it overtops its banks, marginal embankments are necessary for preventing large areas from being injuriously flooded. These embankments, if not scientifically designed and aligned, are a source always of great anxiety, and often of actual mischief, when they are overtopped and breached, and hence arise the hopes and fears which exercise the population of the Egyptian Delta annually at the period of "high Nile," for on the stability of the embankments within which the flood is restrained the agricultural prospects of the year entirely depend. One chief duty which belongs to the Public Works Department, therefore, is the maintenance of the marginal embankments in the highest state of efficiency. Along with protection from floods, the distribution of water for irrigation demands absorbing attention. In order to maintain a sufficient supply in the main canals during the low-water season, the structure, known as "the Barrage," was designed nearly forty years ago by Linant Bey, a distinguished French engineer. It consists of a bridge in two sections thrown across the two branches into which the Nile is divided 12 miles below Cairo. The sections comprise seventy-two and sixty-two arches respectively of 16 ft. span, the piers being founded on a broad solid platform of concrete several feet thick. The arches were fitted with iron gates capable of being lowered and raised according to the level at which the water was to be retained, the maximum being 14 ft. above summer-level. Either from original defects or other causes this important work has as yet never fulfilled the purpose for which it was built. During Ismail Pasha's reign many engineers were consulted, and plans prepared for rendering the Barrage effective, but up to the present time nothing has been done, and the structure has always been considered an engineering failure, and a monument of Egyptian extravagance. The work, however, is by no means a failure; on the contrary, one of the first improvements to be carried out with the funds which the British Government must inevitably provide for the restoration of the Egyptian finances, will be the adoption of measures for rendering the Barrage effective, and capable of fulfilling the purpose for which it was originally designed, and simultaneously a new and large canal, forty miles in length, is to be constructed for bringing the eastern system of canals in connexion with it.

The completion of the great Ibrahimieh Canal, the construction of docks, syphons, aqueducts, and bridges throughout the canal system in the Delta, are to be at once undertaken, while additional works of irrigation are contemplated in the provinces of Ghizeh and the Fayoum.

The extension of the Railway system by the construction of several subsidiary lines has also been determined upon, but during the present straitness of the finances there seems to be little probability of their being carried out.

Rumours are abroad, however, that the Government of Egypt are prepared to reconsider the scheme of an English Syndicate, which was formed some years ago by a group of influential capitalists with the object of leasing the Egyptian lines, but was obliged to be abandoned owing to the disfavour with which its proposals were received. With such a syndicate, however, the requisite capital would easily be obtained.

A beneficial change of policy in regard to public works has now evidently been introduced, and there can be little doubt but that if the present energetic head of the department continues to receive the support of the Prime Minister, there is still a very hopeful future before the country; but, and the "but" in this case is very serious,—is England prepared to do its duty by Egypt? If not, it is perfectly certain that there are other nations ready and eager to respond to the Egyptians' appeal for assistance, and to whom it is equally certain they will appeal, knowing that their appeal will not be in vain.

NOTES.

THE Hyde Park Corner improvements have certainly given rise to plenty of fighting. A fresh *casus belli* came up in the House of Lords on Tuesday evening, over the second reading of Lord Sudeley's "Hyde Park Corner (New Streets) Bill." The alterations are generally spoken of as a great public improvement, but each party interested denies that the benefit is felt by themselves. The extremity of the Green Park is in the parish of St. Martin's-in-the-Fields; Grosvenor-place in the parish of St. George, Hanover-square. But each parish denies any moral obligation, and wishes to escape any legal obligation, to maintain the roads thus formed. The Office of Works suggested that the Metropolitan Board of Works should maintain the roads, a suggestion which was met with *non possumus*, the Board not being a road authority. The Office of Works cannot maintain them, because "Parliament will not vote money for maintaining metropolitan improvements of this order." But the Metropolitan Board of Works is very willing to act as head in the case, and obtain statutory powers to enable them to decide who shall maintain the roads. Like Lady Blanche in the "Princess Ida," they look forward to the pleasure of dealing out all the punishments, and Lord Sudeley's Bill was to give them these powers. The second reading was lost by a majority of 94 to 70; so there the proceeding for the present halts. It appears to us that the common sense of the matter is that the roads, being after all but roads, with no mysterious or unusual qualities connected with them, should be maintained, as usual, by the parishes in which they lie; but it would, perhaps, have been as well if something definite had been foreseen and arranged before the First Commissioner of Works devised the improvements which, as Earl Powis was pleased to phrase it, "were to make Hyde Park Corner perpetuate the memory of his own official career instead of that of the Duke of Wellington."

SIR EDMUND BECKETT gave what he called the "first sermon" in the restored nave of St. Alban's Abbey, on Wednesday last week, before about forty members of the Oxford Architectural and Historical Society: a discourse trenchant and amusing in many ways, but which would have had closer association with the ideas we usually attach to a "sermon" had it exhibited any admixture of the Christian virtues of humility and charity. Of course, the sermon was in praise of the preacher, and in derogation of the deceased architect, Sir Gilbert Scott, who cannot now defend himself, and whose former assistant in the work appears to be now "making himself generally useful" to Sir E. Beckett, and quietly "assisting" (in the other sense) in the sacrifice of his deceased employer's reputation at the shrine of the enormous egotism of the present self-constituted architect. Still, there were points in Sir Edmund's address. If it is really true

that the original architect for the restoration said that the nave roof would do as it was, without having been up a ladder to look, Sir Edmund certainly scored one, especially as the object of his sneer is safe in the grave, and cannot contradict him; and he made another point when he spoke of the enormous amount of timber which was built up inside the nave to prepare for the operation of pushing the wall up, merely to resist the tendency of the wall to fall inward, which it need not have had if quietly pushed up to the perpendicular. But then there is something to be said on the other side of the wall. If we may trust an eye-witness, it was well that there was a firm abutment of timber on the inside, when hydraulic presses were set going, not slowly and simultaneously over the whole length of the wall, but poking at it first here, and then there, till the masonry was all in so many "buckles," one man being left to work away *ad libitum* at his pump-handle till he was accidentally caught sight of and hailed with a "hold-hard," followed by the *sotto voce* criticism, "He's going on like h-l down there." That would hardly be considered by engineers to be a very scientific or workmanlike way of doing it. Then we should like Sir Edmund, if he does us the honour to quote us, to quote correctly. He is very fond of repeating that we said his "front was only fit for a Methodist chapel," and he told the Oxford folk so last week. Our words were carefully weighed, and included no such gross and inept generalisation. We said: "The general look of the whole front may be best indicated by saying that it is very much the sort of Gothic which one sometimes meets with in competition designs for the larger class of Dissenting chapels,"* which is not quite the same thing, either in form or substance. And, by the way, if it is not asking secrets, who did really design that wonderful front? Of course we know it is called Sir Edmund's, but designing is in the first instance drawing, not setting other people to draw, and we never heard of a drawing by Sir E. Beckett yet. Was it the aforesaid too complaisant ex-assistant, after all?

THE Select Committee on the Preservation of the Thames continues to elicit interesting, though rather conflicting, evidence as to the views of the subject taken by "riparian owners," some of whom seem to look at things in general through special riparian spectacles. One of these gentlemen has taken up the ground that the bed of the river is part of his manorial property, and "the accident of its being covered with water" did not abrogate any of his rights over it. We are not lawyers, and do not profess to pronounce whether this decision be true in law, but every person (except a "riparian owner") will agree that it is false to common sense, not to speak of common courtesy and regard for the pleasure of others. Indeed, the narrow-minded selfishness and "dog-in-the-manger" feeling which seems to pervade the minds of many people who have houses on the banks of the Thames, and their desire to shut out the enjoyment of the river from the thousands to whom it is one of the few real enjoyments which can be had at a cheap rate, is something, to our thinking, quite contemptible.

SIR JOHN LUBBOCK will eventually receive canonisation (we hope not for a long time to come) as one of the true benefactors of his generation, if he can carry his Bill for regulating the hours of work for young persons in shops. His provisions go to ensure "young persons" (between thirteen and eighteen) one half-holiday a week, and the restriction of work to twelve hours in the day, with an hour and a-half off for meals and resting; and the evils of over-crowding and want of ventilation in the working and sleeping rooms of shop employees are also to be dealt with. We welcome this Bill the rather because we do not regard the famous "St. Lubbock's Day" as an unmixed good; its advantages have been overrated. It ensures a

few whole holidays to the working classes (besides Sundays), no doubt, but it does so at the cost of a good deal of inconvenience to others, and (which is more important) the wholesale turning out of the whole working community on the same day, to a great extent, spoils the holiday itself, as the people are all in each others' way, and spoil for each other the quiet and the beauty of the parks and other scenes to which they repair, and which become for the day, unsightly, noisy, and strewn with rubbish. We question whether any classes find Bank Holiday other than a doubtful enjoyment, with many drawbacks.

THE case of the Peel Grove Burial Ground, which was heard at the Worship-street Police-court on Tuesday last, is somewhat instructive. The ground was once the property of a builder named Kelday, who made much out of it as a cemetery. In 1853 it was closed as a place of burial, when the owner pulled down the chapel, removed the tombstones, and "shot" a good deal of rubbish over the surface, and having deposited as many of the dead as he could a little beneath the surface, prepared the ground to receive the homes for the living, so as to make the best of both worlds. A previous attempt to build on this "eligible situation" had already been frustrated, as noted in our columns last year; but the present owner, Mr. Chambers, has now actually commenced building on the ground, and been brought up by a summons from the Metropolitan Board of Works under the by-law provided against the erection of any house "upon a foundation or site which had been filled in or covered with any fetid animal or vegetable matter, or until such matter had been removed and the site covered with a 6in. layer of concrete." Mr. Hannay's judgment was that the by-law did not apply, as it referred to cases in which the unwholesome stuff was the actual soil built upon and in contact with the structures; that appears to be the precise meaning, at least of his judgment. "Is that the law?" If so, the sooner it is amended the better, and till it is, we would exhort the administrators of the law to act in the spirit suggested by Bassanio—

To do a great good, do a little evil,
And curb these jerry-builders of their will.

The use of disused burial grounds as recreation grounds, about which some sanitary questioning has been raised, not quite unnecessarily, is not, however, a parallel case by any means. There the new and carefully-kept vegetation tends to close the surface, and the ground is not opened down, or nearly down, to the level of the old interments, for footings and foundations.

MR. STUART POOLE, of the British Museum, invited the Royal Academy Students' Club on Saturday, and during the evening spoke with the members on Arab art and architecture, and the way it may be used in modern Western work. His short and interesting conversation is to be followed by a lecture illustrated with diagrams by the Academy students.

In reference to the interference with Mont St. Michel, concerning which we published some remarks not long since as to French differences of opinion, a correspondent in Paris writes:—"If the project of building a dyke across part of the bay be carried out, as at present proposed, the result must be to throw an irresistible rush of water against the Mount, the foundations would be eventually undermined and the island swept away. Such at least is the opinion of M. Corroyer, a French architect, who, having recently been employed to carry out extensive restorations on the Mount, has made a special study of the question. This question had been, it was supposed, decided in favour of the dyke versus the mount by the late Minister of Fine Arts and the present Minister of Public Works. We are glad to hear, however, that it is again to be brought before the Senate. Meantime a body of Belgian architects (Société Centrale de l'Architecture en Belgique) after visiting the mount have addressed a letter to the French Minister of Fine Arts signifying their unqualified approval of the recent restorations, and ex-

* See *Builder*, vol. xlv., p. 172.

pressing the hope that something may be done to ward off the threatened danger to the foundations."

THE competition models for a national monument to Gambetta have been on view at the "Beaux Arts" since Tuesday last week. There are about eighty designs. One very noticeable feature of the exhibition is the comparatively inferior place occupied by sculpture, and the predominance of architecture. As an exception to this rule we notice M. Falguère's fine design. The statue of Gambetta rises from a large pedestal, at the angles of which are four allegorical groups representing political wisdom, military duty, national defence, industry and instruction. The jury have found it impossible to award the prize to one project where there are so many good ones. A certain number of candidates have, therefore, been selected, who will compete again in November. The site for the monument has not yet been decided on. It will, of course, depend to a great extent on the project chosen. The space in front of the "Corps Législatif" is one amongst many positions proposed.

MR. A. BRUCE JOY has at present collected, in his new studio at 26, Savile-row, several portrait works of considerable interest, including the bust of the Archbishop of Canterbury, the medallion portrait for the monument to Sir W. Siemens, a medallion of the late Admiral Sir E. Codrington for his monument in St. Paul's Cathedral, the statue of Mr. Christopher Bushell, and the medallion portrait of the late Duke of Albany.

FROM an American paper we learn that the unfinished Washington Monument, which has been unfinished so long that it has passed out of the memory of many of us that it was ever begun, is to be completed. It is an obelisk of white marble, and had been carried up 150 ft. and then left, when in 1880 Col. Casey was appointed engineer in charge to complete the work. It has now reached the height of 414 ft., and is intended ultimately to be 555 ft. in height. When the work was resumed, the structure was found to have settled slightly out of the perpendicular. A new base line was formed by tunnelling and filling in with Portland cement. It is odd to find the youngest great people in the world coming back to the practice of the oldest, and the modern republic glorifying itself by erecting an obelisk, just as did the ancient tyrant. The architectural effect of such a mass, with no detail to give it scale, must be to crush out of proportion all the ordinary buildings of Washington; and we very much question whether so barbaric a means of blazoning their country's greatness commends itself to the taste or feeling of cultivated Americans.

MR. MITCHELL HENRY has come out as an architectural critic *in re* the new War Offices, which he suggests should be built of Kingstown granite, which he used for his own house, and which will not be perpetually in need of repair. That it would be a wise move to try the experiment of a practically indestructible stone for our last new public building we do not deny. Mr. Henry's conclusions are better than his reasons. He thinks the best style of architecture for London "Palladian," which "depends for its beauty on effects of light and deep shadows." This is certainly a new analysis of "Palladian" architecture. Does Mr. Henry know, by the way, what Palladian architecture really means, and that it is one of the most false and practically rigid and unmanageable styles of architectural clothing (for it is not architecture) ever invented? As to the shadows, we used to think that Gothic specially dealt in "dark shadows," and that these arose naturally from seeking effectiveness in dull northern atmospheres. Then granite will not lend itself to "Gothic carvings," which are out of place in London, where they soon lose their sharpness. True enough, and equally true of classic capitals cut in granulated stone. We have long said that London is not the place for undercut stone ornament. Mr.

Henry's final recommendation, for a "plain but handsome building," seems a little Hibernian in expression, but it is in true keeping with the modern official and commercial spirit in regard to architecture. The very word "handsome" betrays the Philistine.

SOME ASPECTS OF ARBORICULTURE.

THERE was a time in England when wood constituted, as it still does abroad, the chief fuel for the domestic fireplace. In this country, indeed, only within two centuries or so has coal taken the place it now occupies, much to the annoyance of all sensitively-minded people, who, since the days of Evelyn and his attack on the fatal effects of coal, have never ceased to utter their complaints on its generally destructive influences. But it is long since England has been in a position to supply the requisite amount of wood for ordinary fuel, much less has it been able to produce what timber is required for the numerous other purposes for which wood is so necessary. Had not coal on the one hand, and iron on the other, been found as substitutes, it is difficult,—were not such imaginary suppositions idle,—to see how many portions of the world could have contrived to exist. For a long period we have been dependent on importation, but with that reckless extravagance and absence of due consideration for the near future which is, perhaps, only too marked a feature of our modern existence, the apparently unlimited stores upon which this supply has been drawn are now discovered to be exhaustible, little or no provision having been made to replant the districts which have been ruthlessly hewn down.

The subject is one of somewhat more importance than the generality are apt to believe, and it is a matter for congratulation that the Forestry Exhibition to be shortly held in Edinburgh cannot fail to bring before the world at large many facts of a nature to throw some much-needed light on a question touching directly the interests of the building and kindred trades, and indirectly, it may be said, the community at large.

Reference was recently made in these pages to the growing scarcity of wood for purposes of fuel in Russia, a country believed to be an unlimited field for the exploitation of timber of all kinds. There are not wanting signs that within a measurable distance of time the apparently limitless Scandinavian and Baltic yield generally will come to an end. America, vast as are still its backwoods, cannot continue at the present rate to supply the demand made upon its natural resources, and, indeed, long since the note of alarm has been sounded by authorities who have pointed out that unless a rigid scientific organisation of the great forests be set on foot, the timber supply of the States must soon come to an end. In every country the position is the same, and yet of all objects of industrial consumption timber may be regarded as, perhaps, that which, by a simply organised system, can be the most easily rendered indefinitely inexhaustible. Nature requires but to be assisted by the work of man,—work, too, far from unpleasant,—and the timber and fuel supply of the world need be a source of no anxiety. Let but the matter be taken up now, while there still exist huge supplies to draw upon, and there will occur no absolute scarcity of material; let but the question of scientific re-planting be delayed, and such a scarcity must inevitably make itself felt, and that before long, judging by the indications already given of the supply failing in more than one quarter. It is true that whenever the matter is taken up seriously it can always be managed; Nature's recuperative powers are happily inexhaustible when not suicidally overtaxed, but in the interim a great scarcity in an important necessity would be felt. The recuperative powers of Nature are, we repeat, inexhaustible when not overtaxed, but where this has been the case it is no longer a matter of industrial inconvenience, but of social annihilation. We have but to see the present condition of Asia Minor, of Palestine, of Syria, of Persia, of Mesopotamia, of Egypt, of the whole of Northern Africa, to be made fully aware of the fatal effects which have followed on a reckless destruction in the past of the forest growth which once ensured these now half-deserted districts of arid sand, a heavenly climate and a prosperity which is Biblically and historically proverbial. But this is another and

far more serious side of the question than that which we are at present considering.*

There is no reason why, under proper conditions of sylviculture or forestry, wood should not once again serve in England as domestic fuel. It did in the past, it still does on the Continent, and with the further use of charcoal, once also universally used in this country, tend to decrease the yearly growing smoke nuisance caused by the imperfect consumption of the millions of tons of coal we burn. In coal, let it be remembered we have a fuel which must in the course of time, however remote, be exhausted, and which no power of man can replace. In wood, however, we have a fuel,—looking at the matter merely from this circumscribed point of view,—which by the simplest organisation can be as regularly produced as it is consumed. Whole tracts of land in our country, which at this moment are lying waste, a source of no income either to their owners or to the community at large, might be rendered highly remunerative if planted with the trees which the science of the sylviculturist shows to suit best the soil and the generally existing conditions; these conditions, however, apparently unfavourable, lend themselves in almost every instance to some growth, either rapid or slow, of trees suitable for timber as fuel. In a rough-and-ready manner this fact has at all times been familiar to land-owners, but what is now required, and in our country especially, is a far more completely organised department than at present exists, which shall, as in the case abroad, scientifically consider this important question of utilising the soil for the purpose of supplying timber for fuel and other industrial purposes; special schools, such as have long existed on the Continent, especially in France, Belgium, and Germany, schools where the question of arboriculture is considered in all its many bearings, and admission to which is only obtainable after severe examination, and is merely preliminary to many years of what may be termed apprenticeship in the forest districts scattered over the country, each and all of which are regulated by a body of intelligent and active officials. Such a service, which to some extent exists in our Commission of Woods and Forests, and but in a more developed form, in our Department of Indian Affairs, could not fail, we should imagine, to be popular, and when, as every day we are being reminded, foreign competition in the production of corn threatens the almost total annihilation of our trade in home-grown crops, the growth of timber is a direction of national industry to which our hardy climate especially lends itself.

At present, in consequence of the increasing scarcity of wood, coal, even in wood-growing countries, is rapidly replacing the more traditional fuel. In Paris, coal, with fatal effect, is yearly being employed in larger quantities for the kitchen fire, where till now wood has been invariably used, though, let it be noticed, the cleanly and thrifty charcoal *fourneau* still holds its own with a success which should entitle it to a more universal introduction into our country. Yet, in spite of the increase in the price of wood as fuel, it is still used commonly for the domestic fireplace, and is far from being the luxury it is considered with us. In France though there exists an admirably organised Government system of managing the national forests, the supply of wood from a country the soil of which, aided by a genial climate, lends itself to so many other more remunerative productions, is necessarily limited. Were other less favoured tracts,—such, for example, as the Scandinavian peninsula, the great districts of America and Russia, not to mention many other portions of the globe,—to apply themselves to the question, the supply would be ample for everybody and for every purpose for which wood is required.

Then, again, we might enjoy every day in our homes what is acknowledged now to be a luxury, a wood fire; the atmosphere of our cities would cease to be rendered unwholesome and murky with unconsumed carbon, our valuable surroundings would cease to be besmirched with intrusive blacks, we should once again be

* From another point of view, the question deserves attention. The reckless destruction of trees in the present day has been proved to have been the direct cause of many of the terrible floods of recent years, particularly in Northern Italy, where the mountain torrents tearing down the tree-stripped slopes swell the rivers to an extent unknown in the past. The absorptive power of trees is a fact familiar to all who have in any way studied the question of arboriculture.

enabled to enjoy the pleasure of open windows and clean muslin curtains and delicate hangings, our pictures would cease to need plate glass to protect them, the beautiful relics of our architectural past would no longer be destroyed as they are now by the action of our sulphur-laden fogs, while that great mainstay of our wealth, our huge coal supply, would be spared for those purposes for which it is more suitable than it has proved itself to be for the domestic fire-place. To the architect the return to the traditions of a past from which he derives his whole inspirations could not but be grateful, the question of designing and introducing coal-consuming grates being one of the most troublesome at present brought under his consideration. With the whole field of design to draw upon, afforded by the grandiose fire-places of the past, with their picturesque accessories,—which, though at present introduced are practically out of place with the use of coal—no one ought to advocate the return to the use of wood in the domestic grate more warmly than the artist.

LANDSCAPE AT THE ROYAL ACADEMY.

LANDSCAPE painting is seldom the strong portion of the Academy exhibition, and it is certainly not stronger than usual this year, though there are two or three noticeable works which rise above the general level. Mr. Hunt sends nothing, which is not to be wondered at after the kind of treatment he has received at the hands of the Academy, and perhaps his absence would be the first thing that any one paying special attention to the landscape portion of the exhibition would note. Perhaps the next thing that such a visitor would remark would be the performances of the last landscape Associate whom it pleased the Academy to select as specially deserving of the honour of enrolment. The best of Mr. Colin Hunter's pictures is the "Herring Market at Sea" (389), fishing-boats clustered round a steamer in the middle of the sea in early morning. The scene when the herring-boats discharge their cargo on board the steamer and take back "empties" has been described to us as one of great animation and confusion. Mr. Hunter's representation is only of a sleepy mass of boats with hardly a sign of life about them; but sea-painting is the point of the picture, and the tone at least of the early morning sea seems there, though the water is of a rather treacly consistency. Of the two paintings in Gallery I. we can only say that if they represent sea at all it is a bottle-green sea frozen; the "waves" are hard masses with sharp edges. We have taken the trouble to compare notes on these paintings, and find them received with general disfavour, and the honour paid to the author of them is certainly significant in regard to the value of the corporate judgment of the Royal Academy on sea-painting.

As we have got on sea-painting first, we may go at once to Mr. Brett's two remarkable works, "Macleod's Maidens" (395) and "A North-easterly Gale, Granton" (852). The "maidens" are certain rocks off Skye, shaped, by the beat of the waves of who knows how many thousands of years, into rough likenesses of draped women, even the bonnet of one dress being indicated by the horizontal layers of different coloured strata. We are inclined to suspect that the painter has helped the illusion a little, but that does not interfere with one's enjoyment of the wonderfully-painted sea, the swell of which seems to heave under the eye as we look at it. The "North-easterly Gale" is, however, the more powerful work of the two; the sea in the foreground is full of wild movement, the whole picture full of wind and coming squalls with dashes of fitful sunlight between them; the smoke from the steamer's funnel rushes off in a straight line half across the sky, this one incident greatly intensifying the general effect of high wind. Among other sea pictures Mr. J. C. Hook is not at his best in "Catching Sand-lance" (352), which is rather dull and heavy in tone, but he is quite at his best in "The Mirror of the Sea-mew" (346), an incorrect title by the way, as the sea-mews are not mirrored in the wet sand, though they might be, no doubt, if it had pleased Mr. Hook. But the painting is a masterpiece of that particular method of sea-painting which the artist has made his own, in which detail is sacrificed to the desire to intensify the look of open-air freshness and

salt-laden breezes; and Mr. Hook's are almost the only sea-pictures in which we really seem to smell the odour of the sea, and "suffer a sea-change" as we look at them. It would hardly be possible to analyse this result, and determine what is the subtle connexion between Mr. Hook's peculiar method of handling, and the reality of sea-impressions upon our senses; probably he could not tell himself; but he has become penetrated with the feeling of the sea, and some of it at least slips through to the end of the brush, though we are sure there is far more behind than Mr. Hook or any one could paint. But he has acquired a style in which mechanism is forgotten by the spectator, and which is an apparently facile translation of sea into the language of art, not a copy. Another painter this year, Mr. John F. Faed, aims at literal imitation in "A Wintry Sea" (752), a work which would hardly have been produced had not Mr. Shaw led the way, but which is a fairly good specimen of the protest which has been made lately against the very grey and blue views of sea tone which our leading sea-painters have adopted. Sea tones are endless in their permutations, in fact, and sometimes the sea is the greenish-brown depicted here; the curl of the breaking waves is rather weak, however. The sky is fine.

Among landscapes properly so-called, Mr. Vicat Cole is much on the line as usual, and quite up to his usual standard. It is a curious question why pictures which contain so much beautiful and facile work are so unsatisfying. They completely reach the painter's apparent aim; long practice has given him entire mastery of what he wishes to do; but that aim is always the same, and it is not a high one. In "Oxford" and "Mapledurham Lock" (252, 259), we see the same end, the wish to give the external picturesqueness of a river scene, the foreground treated with considerable realism, the whole effect conventionally worked up into harmony with a special scale of colour and a special tone of water, which Mr. Cole seems to see wherever he looks, and which he has got by heart. The effect is charming, smooth, a sort of enamel painting on a great scale; but we do not call that landscape-painting, we should call it landscape manufacture. One specimen is very well to see; but one is enough. There is in these works no evidence of any feeling for that undefinable and ever-varying expression which lies beneath landscape; Mr. Cole seems only to see outside facts, and groups them into an effect. As an example of the difference between this and the poetical method of painting nature may be adduced Mr. C. E. Johnson's fine work, the "Wye and the Severn" (811), to which he has attached the stanza from "In Memoriam":—

"There twice a day the Severn fills,
The salt sea-water passes by
And hushes half the babbling Wye
And makes a silence in the hills."

This may not have all the fluency of painting, so to speak, which characterises Mr. Cole's work, but it is a picture really fine and pathetic in composition and feeling, a picture which produces on us something of the same feeling which nature herself produces on the mind, and which mere manufactured art, however clever, can never arouse. A little picture in the same room as this, by Mr. C. L. Wyllie, numbered 785, but obviously with a wrong title, should be looked at, a river scene at low water. We have seldom seen anything more true and aerial in effect than the reflected light on the calm water.

The landscape by Mr. David Murray, "My Love has gone a Sailing" (928), which is purchased with the Chantrey Fund, is, we presume, one of those which have aroused criticism "in another place" in regard to the administration of that fund. It is an effectively-composed landscape, with some tenderness of effect in the clouds and distant water, but very deficient in force as a whole, and its selection for the Chantrey purchase we cannot understand at all. Among the works by artists who "keep the line" in more senses than one, Mr. Peter Graham sends an unusual and effective picture entitled "Dawn" (27). As to whether it is really an effect of dawn, so few of us in these days of conventional hurry ever see an out-door dawn, that when a painter gets up early to paint it, we must just put ourselves in his hands and take what he gives us. It does not quite impress us with the notion of dawn, but the heavy, floating mists have movement and lift,

and there is something in the quietness of the whole scene, and the look of the small boats stuck irregularly over the bare ground by the lake, which is impressive. Another Scottish landscape, by Mr. H. W. B. Davis, "On the Hillside: Clearing after Rain" (286), albeit again somewhat of the prosaic school, contains really fine pictorial elements; the purple hills, the long loch receding in the distance, point after point, the cattle in the foreground cleverly arranged in a crescendo of colour, dark brown, light yellowish brown, white,—the latter in a blaze of sunlight. Mr. Peter Graham's other large work "Sea Mist" (216), has followers, but the foreground is almost a mechanical repetition of what he has previously done, and as to the mist, we have a faith that mist is not very difficult to paint. The picture strikes one as a little theatrical. Mr. J. Campbell Noble's "The Vale of the Clyde" (450), hung too high, is a work to be looked at, and one of the too few poetic landscapes. In the same gallery "Afternoon," by Mr. Leslie Thompson (408), is also a work aiming at poetic feeling, but this is an example of an opposite danger; it contains, one may say, more poetry than painting. "The Field of the Cloth of Gold" (614), by Mr. Lionel Smythe, is a distinct attempt to embody a special effect of nature, the combination of a stretch of golden cornfield with a stretch of nearly blue sky; the feeling and manner suggest reminiscences of Cotman. Mr. MacWhirter's "Windings of the Forth" (491) with a good foreground, suggests panorama rather than landscape. "A Dappled Sky, a World of Meadows" (745), by Mr. Frank Walton, is also most noticeable for truth of realism in the foreground; the stretch of flat country rather wants colour and some of those stray gleams of light, which play upon level distances and suggest so much. Mr. David Murray's "Loch Linnie" (1,617) is a good work, and we may close by directing attention to one by Mr. Wyllie, "The Close of a Winter's Day" (1,589), a scene on a snow-covered quay, by which is lying a wooden man-of-war, built on an antique model, black by contrast with the snow, and eloquent with that pathos which hangs around old ships that have had their day of life and battling with the elements. This picture is really an expressive and concentrated poem, with almost a moral pathos in it: it is a pity that there are so few pictures of which one can say that,—so many that illustrate the deft handling of brush and pigments, and nothing more.

SOME DISUSED MIDDLESEX CHURCHYARDS.

When keeping his school at Edial, with David Garrick for one of his few pupils, Dr. Johnson composed the greater portion of his tragedy "Irene." He read what he had written to his early friend, the registrar of the Ecclesiastical Court of Lichfield, Gilbert Walmesley, taking amiss the distress to which the heroine is reduced, asked, "How can you possibly contrive to plunge her into deeper calamity?" Alluding to the Court's supposed oppressive proceedings, the author slyly replied, "Sir, I can put her into the Spiritual Court." Whatever opinion may then have obtained as to the courts of this kind, it is certain that recent acts of the Consistory Court of London better deserve commendation. For on the 12th of May last Dr. Tristram, Q.C., in his capacity of Chancellor to the London Diocese, granted three or four faculties affecting certain disused churchyards within the limits of the see. One of these is for the making a pathway through the churchyard of St. Lawrence, Brentford, so as to afford access to a new burial-ground which has been provided in close proximity thereto. St. Lawrence, at the western end of the town, near the Brent bridge, serves as a church for New Brentford. The register dates from 1570, but the present brick structure, with the exception of the tower, is a rebuilding of 1762. The old church is celebrated for the ministration during thirteen years of Horne Tooke; for Flaxman's monument to Dr. Ewin; and for Zoffany's painting of the Last Supper. Zoffany then lived at Strand-on-the-Green: he introduced his own portrait into the picture, in the character of St. Peter, whilst the heads of the remaining apostles are taken from fishermen of the locality. Superstition would seem

* This title is also appended to Mr. Wyllie's other work already referred to (786); it obviously belongs of right to the one now described.

to have long survived in this parish, since in the churchwardens' accounts for 1634 is an entry of 11s. charged for the "conveying away witches."

Another faculty authorises a scheme for improvements in the churchyard of St. Mary, Paddington, and for enlarging the district mortuary. To what we lately said upon this matter* we need only to add here that the Board of Works agree to contribute 700*l*. (or one half) towards the contemplated repairs and improvements; and that Dr. Stephenson, Medical Officer of Health to the parish, strongly advocated the separation, in the mortuary, of those who die by contagious and non-contagious diseases. The two other faculties relate to St. Mary Abbots, Kensington, and St. John of Jerusalem, South Hackney. At Kensington a footpath is to be diverted,—that is to say, straightened,—in its course from the street to the church door; and the graveyard behind the church to be put into order and cleaned. The South Hackney Board of Works propose to bring their disused burial-ground under the provisions of the Metropolitan Open Spaces Act; to convert it into an ornamental ground, the tombstones being preserved and placed against a wall. St. John of Jerusalem, South Hackney, should not be confounded with the old Parish Church of St. John, though an origin is, in a measure, common to both. Built of stone, in the Early English style, by E. C. Hakewell, and consecrated in 1848, this fine cruciform church, with lofty tower and spire, replaces the chapel-of-ease in Well-street, which was named (1810) after the so-called St. John's Palace or Priory, in that street.† The Blue Posts, or Bob's Hall, which stood until 1825 at the upper end of Church-street is believed to have been the house of the Templars, whose sojourn in this part of the once large manor of Stepney is yet commemorated in Temple Mills below Lea Bridge. The Knights Hospitallers of St. John succeeded to the Templars and their property, but Hackney already constituted a distinct rectory belonging to the Crown. The church was dedicated at first to St. Augustine, to whose rule these two orders were alike devoted. In 47*th* Edward III. the rectory was granted to the bishops of London, in whom it vested until Nicholas Ridley surrendered the whole Stepney manor, together with the bishop's land, or lord's hold, at Hackney, by indenture dated April 12, 1551, to King Edward VI., who forthwith (17*th* same month) gave it to Thomas, Lord Wentworth. From the Wentworths the manor passed (1720) to the Daniels and Tyssens, of Dutch extraction, the latter now represented by the Tyssen-Amherst family. The solitary church tower is of middle fourteenth-century work: in 1517, Christopher Urswick, rector, and Sir John Heron, King Henry VIII.'s master of the jewel-house, rebuilt the nave and chancel; 100 years later Sir Henry Rowe founded the Rowe Chapel.‡ The new church standing north-east of the earlier and more modern graveyards was begun in 1792 from Spiller's designs. It is remarkable for a square plan having a projecting face, 21 ft. deep, to each elevation; and for the large area at the cross, 63 ft. square, which is covered by the roof that has no inferior support. Many old monuments were removed to the new building; the earliest interments are those of Henry, fifth Earl of Northumberland (1537); Sir John Rowe, Lord Mayor (1570); John Nevill, Lord Latimer (1577); Margaret Douglas, Countess of Lennox; and Christopher Urswick, Dean of Windsor, almoner to King Henry VII. (1521). The register records the baptism of De Foe's daughter and his infant son's burial; Dr. South's baptism; the marriages of Christopher Hatton's son and daughter, and of Fairfax; with the burials of De Vere, Earl of Oxford; George, Lord De la Zouche; and Owen Rowe, the regicide.

The domestic annals of Hackney would fill a volume. In spite of its propinquity to the marshes by which the Danes *temp.* Alfred had taken boat up the Lea to their stronghold at Ware, the once vast Stepney Estate§ was the centre of fashion in Plantagenet and Tudor times. The manor-house of the London bishops

stood at Stepney-green, by the western entrance into Victoria Park; in Hackney were collected the mansions of several noble families,—the Percys, the Richs, the Rowes, the De Veros, the Brookes, the De la Zouches of a former day. At Shackwell dwell the Herons, one of whom was husband to Cecilia, daughter of Sir Thomas More. De Beauvoir Tower stands on the land belonging to the moated Baulmes, or Balmes, house of Sir George Whitmore. Passing to later times we recall, at Brooke House (which was opposite to Lea Bridge-road), the Percy, Earl of Northumberland, whom we mention above, and who was the first of his line to die in his bed. His daughter Margaret, wife to Henry, eleventh Baron Clifford, and first Earl of Cumberland, was, like to the blind beggar's daughter, heroine of a ballad, "The Nut Browne Mayde," imitated in Prior's "Henry and Emma." Henry the son, sixth earl, arrested Wolsey, his former master, at Cawood, near Pomfret. He is said to have been contracted to Anne Boleyn, who, in the chapel crypt of Lambeth Palace, confessed to the betrothal, vainly hoping thereby to save her life. He died at Brooke House, June 30, 1537; his brother Thomas having previously suffered at Tyburn for high treason. Henry, eighth earl, the honours having been restored by Queen Mary to a son of the attainted Thomas, married Katharine, a daughter and co-heir of John Nevill, fourth Lord Latimer. Her mother's monument was sadly damaged at the destruction of the church. That lady, who died February 28, 1582, was daughter to Henry, second earl of Worcester, of royal descent, and ancestor of the ducal house of Beaufort. Brooke House subsequently passed to Fulke Greville, Lord Brooke, of whom we lately gave an account in our history of Gray's Inn-lane.* Laura-place marks the site of the residence of the father of John Howard, the philanthropist, which the latter sold in 1785. The "Black and White House," southwards of the churchyard, was built in 1578, and subsequently served as one of the girls' schools for which, even from before the Restoration, the parish was celebrated. A traditional home of the Queen of Bohemia, the "Queen of Hearts," it belonged at one time to the Vyners. Sir Robert Vyner, bart., was Lord Mayor in 1674. It is of his familiarity with his sovereign at a civic banquet that Addison relates so charmingly the story in his No. 462 of the *Spectator*. Richard Cromwell, grandson of Oliver, and Major André lived at Hackney; David Dolben, afterwards Bishop of Bangor, was succeeded in the vicarage by Gilbert Sheldon, subsequently Archbishop of Canterbury. To close our tale with meagre names we may instance Dick Turpin, of Beresford's White House, in the Marsh,—a frequent offender in this quarter;—and Ward the usurer, who did not escape from Pope's repeated lash.

THE FOUNTAINE COLLECTION.

The passion for faience, like the *tone* of a public school, is a thing which must be felt to be appreciated or understood. Of hundreds—nay thousands—of people who for a week now past have been crowding the great room at Christie's, perhaps not a tithe know why they were there, or what it was all about. A body of high-spirited men, starting with a capital of £12,000, formed themselves into a "syndicate." Under the astute leadership of Mr. J. C. Robinson, these single-minded persons bought, on Monday, a pair of Palissy candlesticks for £1,510, and on Tuesday a pair of Limoges enamel, at a more moderate rate—£1,218. These acquisitions will be offered to our Government at the same prices. Other utensils, only a little less precious, have been bought by the same firm with the same object. The ordinary taxpayer, if he had the refusal of these things, would surely decline. It is even to be feared that many who applauded the syndicate when, for £2,728, they wrested those sticks from the dealers, would have thought them dear at 50*s*. had they discovered them in Hanway-street for themselves. Being ourselves a little removed from this crude and dorking state, but not yet arrived at the condition of that correspondent of the *Times*, who wildly declared a *Castel Durante* plate, which actually did fetch £378, to have been "worthy any money," we sympathise in a moderate degree with the

passion, but can by no means account for the prices which are paid for its indulgence. In the case of the "Fontaine" collection, of course, its sound history, and its original collector's high reputation, were circumstances which added much to the value, naturally considerable, of art treasures which are no longer being produced. In many cases we are able to compare the prices realised in 1855, at the dispersion of the celebrated Bernal Collection, with those at the sale this week. The result of such comparison is disquieting to the souls of hopeful collectors. Already, after hardly thirty years, they have increased fivefold. The enormous price of 6,310*l*. 10*s*., brought by the three pieces of D'Oiron, or Henri II., ware is comparatively easy to explain. The pieces themselves were of great beauty, and perfectly preserved. The ware itself is exceedingly rare. In the fourth edition of Chaffers's "Marks and Monograms on Pottery and Porcelain" is a list of fifty-two pieces. Of these, twenty-six were then in English collections, and the remainder in France. The purchases by Messrs. Clément & Mannheim of the three pieces in the "Fontaine" Collection will have the satisfactory result of restoring to our neighbours three valuable specimens of their famous ware. Mr. Chaffers gives a list of the value as estimated by connoisseurs of all these pieces. The candlestick, bought on Tuesday for 3,500 *gs*., is priced at 1,000*l*.; the *Bibéron*, which sold for 1,010 *gs*., he estimates at 800*l*., and the *Mortier à Cive*, for which M. Mannheim gave 1,500 *gs*., is said to be worth 500*l*. From these figures, we must conclude either that the rage for such rarities is increasing at a most unhealthy pace, or that the prices which ruled this week at Christie's were enormously forced by the fame of the collection. With regard to this delicate and beautiful ware, a word of explanation may be given. It is not painted on the surface, like the various Majolica wares of Italy. The ornamentation of each piece appears to have been incised in the soft ground of the vessel, and coloured pastes introduced into the furrows thus made. The whole surface was then brought to a uniform smoothness, and afterwards baked and varnished. It results from this method that the lines of ornamentation seem rather to be depressed beneath the general surface than to stand out from it, as in the case of the Majolica and Nevres wares. Its special beauty consists in the fineness of the clay from which it is made, "a pure white *terre de pipe*, of so fine a texture that it did not require, like the ordinary Italian faience, any coating of opaque coloured glaze or enamel, but merely a thin transparent varnish." The effect of these pieces is not unlike that of the well-known "cream-coloured ware" of Wedgwood. The specimens of Majolica and Palissy ware were too numerous to be noticed in detail. The familiar, and undoubtedly accurate, derivation of the name "Majolica" from Majorca of the Balearic Isles need not be recalled. Nor does it greatly concern us to know whether the Italian potters received their first impulse from those isles or elsewhere. That Majolica was Hispano-Moresque in its origin is certain. That it soon became entirely Italian in character, and altogether superior in technical points as well as in design, is also certain. In the "Fontaine" collection were abundant examples of the "Raphael" ware of Urbino, of Gubbio, of the highly-prized Castel Durante ware of Faenza, and other Italian potteries. The high price of 1,833*l*. 10*s*. paid by the Syndicate for a large Urbino oval dish gives an idea of the estimation in which these fabrics are held.

The Palissy ware was of still more extraordinary excellence. The special character of his work makes it easily recognisable. His dishes and cisterns, with their great borders of flowers and fruit in high relief and glaring colours, give one the idea of a sort of domestic Andrea della Robbia turning his attention to table ornaments instead of to the enrichment of temples and palaces with subjects from sacred story. The pure white glazes of the Della Robbias, however, he never attained. About all his work there is a strange fascination. The presence of a strong and compelling individuality is felt in it all. His love for his snakes, and the terrible fidelity of his representations of them; his beautiful borders of Marguerites; his flowers and shells—all these things we remember long after we have forgotten the bad copies of only tolerable engravings from Raphael, which make the glory of the wares of Urbino. Nevres ware, for the

* See the *Builder*, vol. xiv., pp. 855, 866.

† On the northern side, over against Shore-place. In 27*th* Edw. III., the prior of St. John of Jerusalem granted Beaulieu, or Shore-ditch-place, here, to be held by a quit rent of 8*s*. 8*d*.

‡ Views of the old church, demolished 1793, appear on many local copper and silver tokens of last and the preceding centuries.

§ Gradually divided into the districts of Whitechapel, Shadwell, Wapping, Spitalfields, Limehurst (Limehouse), Poplar, Stratford, and Bethnal-green.

* See the *Builder*, Nov. 10, 1883.

most part, is very ugly. It is remarkable as being the earliest faience of France. It copies, but does not approach, the Italian. With regard to the rich collection of Limoges enamel, we may remind our readers that it is the famous "painted enamel" of the sixteenth century that was here represented—the works of the school of Pierre Raymond, Jean Penicand and his family, Pierre and Jean Courtois, Jean and Susanne Court, and the rest, and not those earlier Limoges enamels executed in a different manner, and famous in the twelfth and thirteenth centuries. These latter were *champlevé* enamel, similar to the *cloisonné* work of the Chinese, but distinguishable from them. In both the design was traced by metal divisions, the enamel being laid within the *cloisons* or prisons thus formed for it, but in the latter the metal divisions were formed of fillets independent of the ground metal; in the former the same end was obtained by lowering the ground, leaving only the ridges where the pattern required. But the later invention of painted enamels did away with the necessity for these *cloisons* or metal divisions altogether. In this kind the outlines are secured "by a difference in the tint of the enamel itself," and the metal base is completely hidden.

THE OXFORD WATER SUPPLY.

PROFESSOR PRESTWICH has recently published a letter addressed by himself to the Vice-Chancellor on the subject of the Oxford water supply, on which it will be remembered he some years ago gave a valuable lecture. His letter deals more particularly with the effect that the proposed Thames Valley Drainage works may have on the Hinckley Reservoir, which the Water-works Company fear will be injuriously affected thereby. The water supply of Oxford is exactly a case where expediency and a mistaken idea of economy on the part of local and independent authorities have led to the adoption of measures which a central controlling authority would never have sanctioned. It is quite plain from Professor Prestwich's description that the selection of the site of the reservoir was not due to its suitability in any respect,—for it is very much the reverse,—but merely to the fact of its apparently effecting a saving in first cost of excavation. But now that a heavy outlay has notwithstanding had to be incurred, it offers a serious obstacle in the way of adopting the course which should have been taken at the outset, of drawing from a higher point on the river a supply which would have been freer from the possibility of contamination, and therefore purer, and which likewise would have been ample in quantity. As, however, the existing works have to be dealt with, the methods which the Professor suggests for obviating any possible risk of diminution of the supply by the Thames Valley Drainage scheme seems, as far as can be judged in the absence of objections from the other side, to be as good as could be adopted under the circumstances.

As the lowering of the flood-level of the Thames in the neighbourhood of Oxford is a necessity which must override every other consideration, including the existing condition of the water-supply,—for the latter can be otherwise provided for,—the company could probably not do better than follow the suggestions of Professor Prestwich, which consist in deepening the existing lake till its summer surface would be on a level with that of the Oxford clay, and so rendering it capable of drawing off the contents of the entire gravel stratum, instead of, as at present, only a limited portion of it, and further remedying the apprehended deficiency in quantity by the construction of an auxiliary lake on the opposite side of the railway to receive the water from the Wytham and Hinckley stream by percolation through the gravel and sand stratum which underlies it. But, after all, these measures are only expedients, justifiable on the ground of economy, which, if the ratepayers in Oxford are exposed to the possibility of unlimited exactions similar to those which the Metropolitan Water Companies have the power to inflict, they are quite right in studying. A practical difficulty, however, presents itself in the execution of these measures, and that is the way in which meanwhile the supply is to be maintained, which the suggested increase of depth to the Hinckley reservoir is being excavated. It seems doubtful whether the expedient recommended by the Professor, of

digging a pit and laying the suction-pipe at such a level as would allow the present reservoir to be drained to the level of its bed, would meet the difficulty; and therefore it would seem to be a preferable plan to seek for a new source of supply at once from some point above Wolvercote, where, Professor Prestwich states, the river would be comparatively free from contamination, and where a site for a reservoir could probably be found of a size sufficient to store during the flood-season enough water for the entire annual supply required by the City of Oxford. The stored water, though possibly not so pure as that yielded by the several springs enumerated by Professor Prestwich, would probably be found quite equal, if not superior, to any supplied by the several Metropolitan Companies.

THE HIGHGATE HILL CABLE TRAMWAY.

IN 1873 the first cable tramway was made in San Francisco, and since that date fifty miles of such tramways have been constructed in that city. In Chicago, there are twenty miles and a half; and there are other lines in Dunedin and Philadelphia. New Zealand has followed; and all these are in successful operation. The Third Avenue Railroad Company, of New York, are now building their first cable road for that city.

The first cable line in Europe was opened a few days since at Highgate by the Lord Mayor amidst much display of flags and floral decorations, with a procession of cars and an inaugural *déjeuner* by the directors of the Steep Grade Tramways Company. The line is about a mile long, and runs from the Archway Tavern at the bottom of Highgate-hill to Southwood-lane at the top; the engine-house and dépôt for the cars being situated well towards the summit on the east side of the High-street. The engines are in duplicate, and of the horizontal Colam type, supplied by Messrs. Grafton, of London. They are of 25-h.p. nominal each, and can be worked together or separately; for economy they are run together at a reduced rate of expansion. They are constructed for a speed of eighty revolutions, with a pressure of 80 lb. to 100 lb. of steam. If the work to be done varies the governors automatically regulate the cut-off of the steam accordingly. The boilers are by Babcock & Wilcox, of Glasgow. They are tubular, and each equal to give 50-h.p.

The tramway itself is a remarkably good example of engineering work, and has the general appearance of a first-class line, with the exception that there is in the middle of the way, between the two rails and parallel with them, a central slot, $\frac{1}{2}$ in. in width, through which the flat steel plate of the cable gripper descends from the bottom of the car into the cable tube, for the connexion of the car and the cable together. The greater part of the new tramway consists of a separate up and down track of 3 ft. 6 in. gauge, but it is particularly worthy of notice that there is also fully 1,000 ft. of single track through which both the up and down traffic has to be conducted. Further, there were many curves and very steep gradients to be encountered. The curves vary from a radius of 3,000 ft. to one of 500 ft., and beyond these the radii at the points and switches, and at the entrance to the engine-house, are 75 ft. and 60 ft. respectively. The gradients of the road vary from 1 in 10 to 1 in 75, the steepest portion being near Hornsey-lane, and the most nearly level being that through the upper part of the Highgate High-street. The above particulars show that this introductory cable line will be subject to very severe and crucial conditions, and, if successful, will thoroughly demonstrate the capabilities of the system. The circumstances above mentioned have necessitated frequent deflections of the cable, both in vertical and horizontal planes, to meet the requirements of the grades and curves of the road, and which are most trying conditions for rope haulage. The car-track, with its two rails and the points and switches, is of the ordinary type, similar to the system in use in Manchester and Huddersfield, and known as the Barker & Dougdale system. There is no reason, however, to prevent any tram-track system being adopted.

The underground cable-tube in which the cable moves is entirely below the surface of the road. It is, in fact, a solidly-covered trench, having in its upper portion two parallel longitudinal girders formed of angle steel and sepa-

rated slightly from each other, so that for the whole length of the tramway there is a continuous opening of $\frac{1}{2}$ in. to $\frac{3}{4}$ in. in width. In this opening the gripping appliances of the cars travel in order to pick up the motion of the continually running cable. The cable-tube or covered trench is elliptical in form, and is about 1 ft. deep by 8 in. across. It is composed of cast-iron frames laid transversely, which carry the steel girders forming the narrow continuous opening in the roadway, the intermediate portions between the frames being infilled with concrete rammed over templates to the proper section of the tube, thus presenting a structure both economical and strong, and readily built by common labour. In this tube, at from 25 ft. to about 40 ft. apart,—the number being increased at the curves and otherwise where needful,—are placed the grooved iron pulleys, 1 ft. in diameter, which support and guide the cable in its underground path. These pulleys are generally vertical, but at the curves they are inclined sometimes up to 45 degrees, to meet the requirements of the cable. Manholes give access at various places to the subterranean tube, and their tops are surfaced with wood to give proper footholds for horses working on the common highway.

The steel cable, supplied by Scott, of Stockport, is made of crucible steel wire, and consists of six strands wound round a hemp core, the lay of the strands being 8 in. Each strand consists of nineteen wires, 0.005 in. diameter. The tensile strength of the metal of the wire is 200,000 lb. to the square inch. The diameter of the cable is $\frac{3}{4}$ in., or nearly an inch; its weight $1\frac{1}{2}$ lb. per lineal foot, and its cost about 40l. per ton.

In order to make the cable endless it is spliced over a length of 40 ft., so that the splicing does not exceed in diameter the original dimensions, and the cable can work uniformly over the drums and the sheaves of the numerous pulleys. The liability of the cable to breakage or stranding is not of any such probability as should cause the least anxiety. In America many of the cables there used have lasted eighteen months or two years, and in some cases two years and three months. As the cable is always under supervision in the engine-room, any damage, such as a ruptured strand, can be at once detected.

The power of the engine is communicated direct by gearing to the large vertical drum or pulley which works the cable. One member of the cable passes from the engine-room down the Highgate-hill to the bottom of it, where there is a terminal pulley sunk in a pit, and round which the cable passes in its course up the hill. At the summit there is another large terminal pulley similarly placed in a pit and fixed rigidly in position. Round this the cable passes in its course and then returns down hill as far as the engine-house, into which it passes from the road. Its course is thus continuous, and it can be driven at any speed up to the six miles an hour limit authorised for street traffic. The ordinary slack of the cable is compensated by the lower terminal pulley in the pit by the Archway, that pulley being attached to a weighted carriage which gravitates down a short length of rails. Any permanent extension of the cable is taken up in the engine-house by means of the frame of the winding drum, which slides over its bed by the motion of a screw.

The engine-house and car depot and offices are in a substantial building of red and white brickwork relieved by pilasters and cills of worked Portland stone. The overall dimensions of the premises are about 130 ft. long by 30 ft. wide. In the basement the boilers, machinery, and plant are located, whilst the ground-floor on the street level is suitably arranged and equipped as the car depot.

The cars used upon the line are of three kinds. Some are bogie cars of the American type; some are "dummy" cars or auxiliaries, used for hauling other cars with passengers or with goods; and some are the ordinary London street cars, such as are run upon the ordinary metropolitan lines, simply fitted with the gripping gear. This gripping apparatus, which is provided upon the cars for the purpose of taking up at will the uniform motion of the travelling underground cable, is an ingenious device, consisting of two moveable jaws, which can be made to embrace or to release themselves from the cable by the transmission of suitable motion from the operator on the car, which he does by means of a hand-wheel and suitable gearing. The jaws of the gripper

travel underground in the cable-tube, and their suspension is effected by vertically sliding steel plates about 1 ft. long, but only $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick, and which pass through and travel in the central longitudinal slot of the covered way. When it is desired the car should stop to take up or put down passengers the bite of the grippers of the cable is released, and the brakes of the car put on the wheels. The cars have also "slipper brakes," which can be put down on the rails, and the whole car lifted by them if need be. By these brakes the cars can be held anywhere on the incline of the road.

WHAT HEALTH OWES TO ART.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.

On the 14th instant a lecture was delivered before the members of the Society for the Encouragement of the Fine Arts, Conduit-street, by Dr. C. M. Campbell, of Edinburgh University, the subject being,—"What Health owes to Art." In the absence of Mr. Ernest Hart the chair was taken by Mr. Cave Thomas, and there was a large attendance of ladies and gentlemen.

Dr. Campbell, after some introductory remarks, said that when a man,—given a good constitution to start with,—had a good and temperate appetite, digested well and slept well, when his muscles were fit for any fair strain, when his intelligence was clear, his temper calm and contented, and his passions under control, such a man might fairly be considered in perfect health; and he would define health broadly as "soundness of tissues and general fitness and harmony of function." In its oldest and broadest sense "art" meant "doing" as opposed to "science," which consisted in "knowing," and its function was to utilise the properties of matter and natural forces, to produce pre-determined results,—results beyond the scope of Nature herself. And so, primarily and broadly, he would define art as "the intelligent, regulated, and disciplined adaptation of natural means to pre-determined ends." Now, what were those pre-determined ends? First, they had the whole field of the useful and practical arts, whose one aim was utility. Secondly, they had the initiative and decorative arts, whose aim was to add grace and beauty to the useful. Thirdly, they had æsthetic art, the end of which, according to Victor Cousin, was the expression of moral beauty by the aid of physical beauty, the latter being only a symbol of the former. Primeval man began with the purely practical, such as the manufacture of weapons, tools, and utensils. If they studied the genesis of art they would find that it developed from the useful to the decorative, to the emblematic, and the æsthetic, and in this last and highest development art became the expression of human feeling, of man's emotions and longings, of his hopes and fears, his love and his hate, his valour and his weakness, whether by means of sculpture or of painting, of music, of poetry, or of the drama. Health and Art were twin sisters. While ideal or perfect health was rare, comparative health was within the reach of most of them if they wisely sought it. Unfortunately not many people did so, the majority of mankind, whether with or against their will, persistently provoking nature to retaliation, whilst vehemently complaining of the penalties imposed. The golden age of disease was the era when foulness of body and raiment was considered typical of holiness, and when Heaven was invoked to stay the plagues which man blindly neglected to combat himself, and they should remember this was not long ago, and was long subsequently to that glowing epoch which produced some of the brightest intellects that the world had ever seen,—that gave them, as priceless heirlooms for all time, those perfect types of manly and womanly health and strength, and purity and beauty, the Grecian marbles, which, though mute, were eternally eloquent. They might rest assured that the nation which produced and cherished these types had not studied the laws of health in vain, or, at least, that it was not then the fashion to habitually and persistently ignore them. It was for subsequent ages, in their ignorance and arrogance, to regard the teaching of the Greeks as altogether vain, to neglect alike the bath and the gymnasium, and to imagine that man purified his soul by brutalising his body. For many centuries throughout Christendom, while priests and

people prayed to patron saints in the midst of their polluted surroundings, plague after plague swept over them unchecked by prayer, or penance, or pilgrimage. When man awoke dare to think for himself there came the first Renaissance,—a Renaissance chiefly of literature and art; science, or, at least, such as related to health, being as yet in the background. And so step by step wise men came to see that if they would live long and be healthy they must find out and obey the laws of health. So deep and far-reaching, however, were the roots of prejudice, of ignorance, and of fashion, that acquiescence in the laws of nature was only partial. The battle was still raging, but they might congratulate themselves that the science of health, as well as the cultivation of art, was steadily gaining ground. To give a practical example of the ground that had been gained, let them contrast a gentleman's house of the present day with such a one as contented their forefathers,—not universally, but very generally. Adaptability of means to end was as much the gauge of goodness in a house, as it was of health in a man, and if they asked what was the chief end of a house, they should find that it was to be a safe, and, above all, a healthy retreat from vicissitudes of weather; a place wherein the occupant's tired brain, as well as his weary limbs, might find rest; where his lungs should get plenty of uncontaminated air, where neither his eyes, nor his ears, nor his nose, should be needlessly irritated, and whence the alliterative triplet, "dust, dirt, and disease," should, as far as possible, be excluded. He feared that, as far as regarded the all-important question of sanitary arrangements, the idea of their forefathers was to ignore them,—to hide them entirely, or, at least, to keep them in the background. Prudery being satisfied, few ever troubled themselves to inquire what became of the extruded products of the establishment. In one respect they must admit that some of their forefathers excelled the builders of the present day; they built thicker walls, and they used better materials, on the whole. Thick walls were necessary if they would preserve an even temperature; it was the house with walls one brick thick that was like an oven in July or August, and like an ice-house in March. All honour, then, to those old builders whose walls were substantial and whose woodwork was seasoned and sound. Let them now inquire how far the occupant's tired brain and weary limbs were likely to find rest in such a house as he was describing. The inside walls were commonly covered with papers, and the floors with carpets, on which the most ingeniously contrived discords of colour were perpetrated,—colours pungent and acrid, conjoined to forms which made one suspect that *dætrium tremens* was painfully prevalent among the designers. If pictures adorned the walls, the few really good ones were as often as not half hidden in some gloomy and neglected corner; while the place of honour was accorded to a recent family portrait, which displayed all the glory of the patriotic red, white, and blue upon the face, the waistcoat, and the high-collared coat respectively. Of engravings there were perhaps a few,—some good, but more commonly of plethoric bishops or other worthies now forgotten. The painting of the woodwork was generally either putty-coloured or grained in a feeble imitation of oak or maple. The pigments used in those days were generally most deleterious to the inmates. The furniture in the era immediately preceding the present revival of older types, was ponderous and ungraceful, and the fireplace, except for the vivifying influence of the fire itself, as charming to contemplate as an ironmonger's shop. The fire, too, was wont to smoke downwards instead of upwards. Ventilation was only dreamed of to be abhorred, and as nature, unwilling to be beaten in her effort to supply fresh air to all her children, still would pour in through chinks and keyholes, our forefathers hung heavy curtains not only before their windows, but barricaded their very beds with them as well. As to cleanliness, there might have been a housemaid's cleanliness, but the dust and dirt and disease-traps were too cunningly contrived for cleanliness, in the modern sanitary acceptance of the term, to be possible. Bath-rooms were quite as exceptionally appreciated as works of art, and those who did appreciate the benefits of either were wont to be regarded as somewhat crazed. Indeed, he feared that the ablutatory standard of the days of Lady Wortley Montagu remained the standard to days not so very remote from their

own. Such was the sort of habitation,—stuffy by day, and stuffier by night, pervaded by noxious odours, and unblessed by harmony of colour, or dignity or daintiness of form,—that was the home of a vast number of English ladies and gentlemen in the first half of this century, of many even later, possibly of some to this day. But it might be asked, "Were not these men healthy and happy in their day and generation?" Some of them were, no doubt; but of the bulk of them he said emphatically, "No!" Nothing was more certain than that in proportion as art had beautified our homes, and men had learned to love it, so had gluttony and intemperance diminished among them,—with what lasting benefit to health he need not attempt to prove. Let them now see what ideal of a home the intelligent man of to-day set before him. His windows (unless they had a pleasant prospect, which was the exception in our cities) be filled with stained glass, which admitted sufficient light, but shut out the all too obtrusive chimney-pots or grimy brick walls over the way; or he fitted it with a case of growing palms or ferns or flowers, and draped it inside with harmoniously-toned fabrics (in lieu of the ghastly Venetian blinds of days not long gone by). The walls of his rooms were now either toned a quiet neutral tint, which did not murder the colours of the pictures arranged upon them, or they were decorated in a more ambitious manner and material, so that their harmonies of colour might of themselves be satisfying to the eye. The woodwork, if of a better sort of wood, was varnished; or if of plain deal, claimed no more than to be painted in harmony with the walls and ceiling. The use of poisonous pigments containing arsenic and lead was much less common than it used to be. Eastern rugs or carpets, or those which were at least designed on similar schemes of colour, now replaced the vulgarian atrocities which of old were all he could hope to attain. Furniture was now artistic in design as well as useful, and couches and chairs no longer bristled with penitential horsehair, but were covered with fabrics in which colour and design united so that there was repose for the eye as well as for the limbs. So, too, with the fireplace, in which bright tiles and polished brass gave an additional glow to the cheerful blaze. He had learned to look jealously into the sanitary arrangements of his house, and though still lamentably backward, he was slowly beginning to appreciate the advantages of scientific ventilation. Let them hope that the day was not far distant when naked gas-lights would be banished from their homes, their theatres, and their public halls, and when their town air, loaded as it was with impurities, should be duly filtered and cleansed before it was presented for their inhalation. Still, taken all in all, was not a man more likely to be healthy in such a house as the last described than in the first one? Was he not more likely to have his senses soothed, his body refreshed, and his intellect stimulated to happy effort? Was a man who had harmony of colour about him, thought and fancy-inspiring pictures or other works of art upon his walls, and who had attuned himself to accept their influences,—was such a man so likely to be cross and dull and discontented, and therefore dyspeptic, if not prone to intemperance, as the man who had nothing but discord, discomfort, and dreariness about him? He said most emphatically "No." But if Art were the friend of Health, most assuredly Fashion was the sworn enemy of both, and whilst it was the pride of Art that her laws, like those of Health, were eternal, it was the contemptible boast of Fashion that her laws were as shifting as the Solway Sands. A very Juggernaut was this same Fashion. As he had said, the old Greeks had left them in their marbles perfect touchstones and types of what men and women in the zenith of their strength and beauty ought to be, and they might be sure that when Fashion ordained, as she too often did, the outrage upon the contour of those forms, she stood condemned as the enemy both of art and of health. He was pleased to observe in the Health Exhibition a few boots exhibited by Mr. Burgess, which were a decided improvement upon the pointed absurdities which Fashion prescribed, and that there were at least some feminine appliances which were a happy improvement upon the iron casings which were impudently displayed in other parts of the same Exhibition. A word as to dress. Might not a dress be devised for men as well as women which should be ornamental (and

dress ought to be as harmonious in colour and graceful in form as an artist could desire), but which should also be comfortable to the wearer, and leave all parts of the body free play to perform their functions? Surely one could be invented which should fulfil the requirements of health as well as those of art. When some such consummation should have been obtained then even more than now would Health have to confess the deep debt that she owed to Art.

HANLEY AND THE HOUSE OF LECHMERE.

It is somewhat singular that there yet exist so many inheritors of ancient dwellings, full of historic interest, and suggestive of family importance, who seem careless of their possessions, and heedless of what becomes of the materials out of which the inner life of the English people in the past must be elucidated, if at all. The knowledge which some of the representatives of our families have acquired of their ancestors and their surroundings is lost to posterity by their death, when a little labour would ensure their preservation, and enable their descendants to acquire that familiarity with their surroundings which enables them to feel that justifiable pride in the past, and that ambition to emulate the good deeds of their ancestors in the future. Many of our family mansions have preserved in the old chests and closets hidden away in odd nooks some valuable information, and in some instances the owner has given to his friends, if not to the world at large, a *résumé* of the treasures which are entrusted to his keeping. These form the most valuable additions to our genealogical and topographical literature, for they are generally accessible to the student of county histories, even though privately printed, and only intended as presentations to friends. The late Mr. Philip Evelyn Shirley, whose loss every archaeologist and antiquary must deplore, set a good example to his neighbours and friends in this direction; for he published, first, a pleasant quarto volume descriptive of his Irish seat at Lough Fee, in the County Monaghan, which descended to him through the Devereuxs, Earls of Essex; and secondly, of his house at Ettington, in Warwickshire, where his family had been seated since the Conquest. When he was suddenly taken away from us, he was engaged in completing a similar work for the Lechmere family, a daughter of whose house he had married. His brother-in-law, Sir Edmund Lechmere, bart., the representative of West Worcestershire, has finished the work, and out of simple justice to the gifted author, permitted it to have a wider circulation than was originally intended; for he appears to think that,—

"The Honours of a name 'tis just to guard,
They are a trust but lent us, which we take,
And should, in Reverence to the Donor's Fate,
With Care transmit them down to other Hands."

The family of Lechmere have been connected with the parish of Hanley, near the river Severn, in the county of Worcester, ever since the Conquest,—indeed, it is said that the Conqueror himself gave the site to an ancestor of the family, which was at first called Lechmere's Place or Lechmere's Field, but which is now called Severn End. There is a strong probability that the family came from the Low Countries originally, but there is the strongest evidence that the Lechmeres were in Worcestershire shortly after the Conquest, if the original grantee was not the Roger mentioned in the Domesday Survey. In the reign of Henry VII. they had become connected with other county families, and by their association with Bishop Bonner, who was born on the estate, the family property was much increased in value; but ere a century had passed their faithfulness to the old religion and their love of litigation had materially diminished their worldly goods. Like old Geoffrey Malley, immortalised by Charles Lever, this love of law may have induced the inheritor of the family name and lessened income to make his eldest son a lawyer; and his grandson, Judge Lechmere, collected these memoranda which Mr. Shirley has so ably used, and from which we gather many particulars of the old house and its surroundings. He tells us how 150 Scots were quartered on him just before the crowning victory at Worcester, and how he was chosen first as representative of Bewdley and afterwards for his native county. Before the Restoration he commenced the rebuilding of his paternal mansion, which still exists, and obtained

his pardon from the king, for which he paid 200l. In his diary are abundant allusions to his building and planting at his house near Hanley, which, after being alienated for twenty-two years, was repurchased by the father of the present possessor on the 2nd of November, 1852.

This house is one of the show houses of Worcestershire, for it is a relic of the past, which has not yielded to modern improvement. It is situated close to the little town of Upton-Severn, and contains much old furniture, and no little collection of "curios," principally relating to the family and the neighbourhood. The semi-loneliness of the place gives it an old-world appearance as the visitor approaches the massive piers, surmounted by a lion and dog, and connected by ornamental ironwork, which stand on either side of the portal on the eastern front. Like many old midland houses, the earlier portion is timber framed with the panels filled in with plaster, whilst the later portion is of brick. The former dates from 1580, whilst the latter was built by Judge Lechmere a century later; indeed, the gables of the brick wings bear the date (1673) on shields. In the centre is a massive door, studded with iron knobs, which opens to a passage, on the left of which are the servants' hall and the domestic offices, and on the right a small panelled hall conducing to the best apartments. The central passage leads to an opposite door, which opens on to a grass plot, which stands on the site of a formal garden, depicted in a view yet extant, with chicken houses and vegetable gardens at each end, and opposite the house door was once a massive wooden gate, from which a row of lofty elms, planted by the judge in 1640, led to the village of Hanley. These trees have long disappeared, but Sir E. H. Lechmere has planted others in their place. Many of the old adornments of the gardens have disappeared; we look in vain for the hornbeam hedges, the sun-dials, the terraces. They have passed away, like the deer park; but the judge's study, built on the south-east angle, yet remains, well and lovingly restored. Here the worldly puritan judge used to retire from his household turmoils, for in his later days he recounts the number of grandchildren born in the old house. The western front of the house is far more picturesque than the eastern, for it has many diversified gables of black and white, ornamented with carved mouldings. Some of these on both fronts appear to be of older date than the time generally assigned to the central portion of the building.

The interior of the house differs in many essential details from other Worcestershire houses. The hall is low and small. The oak wainscoting is not very striking. There are a few armorial bearings in the windows, and on the walls a portrait of the grandfather of the present Sir Edmund riding a race at Newmarket, which illustrates the "ghost" story of the mansion. It is related that the gentleman in question was visited in his sleep by a vision, from which he learned that his jockey had "sold him," and his chances of winning a race at Newmarket. Full of the reality of the vision, he mounted a horse, which had once been the property of a highwayman, rode to Newmarket, and arrived just in time to ride the race himself, which he won, and the event is thus commemorated. The dining-room, which adjoins the hall, is likewise low and dull. The drawing-room is in the north wing, divided from the dining-room by a heavy open stair case and a lobby; but its old hangings of white embossed leather are gone, like the tapestry and old furniture, some of which is at Madresfield Court, for when Severn End passed out of the family of the Lechmeres, its old treasures were dispersed, some were sold and some were taken to Ludford, in Herefordshire, the seat of the Charltons, which the heir of the Lechmeres became possessed of through marriage. Still the house has many objects of interest, and indeed Sir Edmund endeavours to restore to it all that can make it like its former self.

As we leave the old house we are reminded of other times as we proceed to the Church of Hanley Castle, where the Lechmeres lie buried. The distant view of the Malverns recalls the Vision of Piers Plowman, the fugitive Owen Glendower, the feuds between the rival lords of Worcester and Gloucester about their rights of the chase. Hanley Castle belonged to the Beauchamps. The last of the name who owned

it was the wife of the kingmaker. She made it over to King Henry VII., when it was restored to her by Act of Parliament after the death of her daughters and their husbands.

The entries of Judge Lechmere would have been more interesting if he had given us more details with respect to the building and its cost. He tells us what he was to give for the lands he bought, but, save the brick wings, he does not mention the cost of the other buildings. He says, under date 1673, "This year I began the brick building on the north and south side of the green court. One Mr. John Avarian (?) undertook ye whole and to provide all materials and make it fit for habitation for 250l. How he will performe time will show." The judge afterwards adds a note. "He fayled in all things." This comprehensive and interesting monograph of an old house and its associations is illustrated by two views and a number of armorial bearings, and is published by Pickering & Co.

THE ANNUAL CONGRESS OF FRENCH ARCHITECTS.

TWELFTH SESSION.

ON Monday, the 9th of June, at half-past two, there was opened in the hemicycle of the Ecole des Beaux Arts the twelfth annual session of the Congress of French architects, under the presidency of M. Chas. Questel, member of the Institute and of the Société Centrale des Architectes. About eighty persons were present at this reunion, among whom were fifteen architects of departments, attending as delegates from the local societies of Lille, Rheims, Lyons, Bordeaux, and Nantes. The President had invited to a seat on the platform M. Abadie, member of the Institute and architect of the Church of the Sacré Cœur; M. Martean, architect, of the département du Nord; M. Van Iseghem, president of the Society of Architects of the department of the Lower Loire; M. Alfred Normand, "inspecteur-général des Bâtimens pontificaux," vice-president; M. Lucien Etienne, "architecte du domaine"; and M. Paul Wallon, "architecte diocésain." The two latter gentlemen being respectively secretary and assistant-secretary of the Société Centrale.

In a brief but dignified address M. Questel, making allusion to the fiftieth anniversary of the Royal Institute of British Architects, celebrated last month, expressed the hope that the Congress organised by the Société Centrale would also one day attain its fiftieth anniversary; he then proceeded to indicate the line of proceedings marked out for the Congress (the synopsis of which we have already published, p. 717, ante), and expressed his thanks to the architects of departments who had made long journeys in order to be present on this occasion, and also to the Directory of the Beaux-Arts for placing their hall at the disposal of the meeting.

The order of the day brought forward in the first instance M. Achille Lucas, honorary architect of the city of Paris, to read his account of the architecture of the Salon in 1884.* In a conscientious review of the various works exhibited, the reader drew attention especially to the following:—1st. The restoration of the Temple of Apollo at Delos, by M. Nenot, as a remarkable study of the existing state and an interesting reconstruction, the more interesting to them inasmuch as the first explorations undertaken by the Ecole de France, at Athens, in 1877, were in part subsidised by a grant from the Congress of French Architects, and MM. Leboucq and Homolle, students of the "Ecole" at Athens, and M. Nenot, pensionnaire of the Académie de France at Rome, received in recognition of their labours at Delos the medal of the Société Centrale, at the Congresses of 1877, 1878, and 1881. M. Lucas next mentioned the Tour de Solidor à Saint Servan (Ile de Vilaine), a restoration by M. Albert Ballu; and he referred to some drawings of the Château de Gisors (existing state), in the chapel of which it is said that Becket said mass when a refugee in France. He instanced a design for a church at Rheims by M. Gosset, in which the architect had succeeded in giving a truly monumental aspect to a brick church, built with necessary regard to economy, and had arranged a plan in which every worshipper could see the officiating priest. A design for a civil and military hospital, to be erected at Vichy, by M. Alfred

* Of the Salon architecture we have published a critical review, p. 685, ante.

Normand, "architecte du Gouvernement," and the most recently-elected Honorary and Corresponding Member of the Institute of British Architects, was mentioned with much praise, as combining practical efficiency with great respect for "lignes architecturales." To these he added, for special comment, a general plan and restoration of the Church of Notre Dame au Sablon, at Brussels, by M. Schoy, a Belgian architect; a private house by M. Camut, and the small Palais de Justice of Meaux, by the same architect; another "hôtel," by M. Benault; and a "Transformation d'une Façade" (that of the Restaurant Lemardelay, rue Richelieu), by M. Eloy, a much too modest title, it was suggested, for what was really the substitution of a highly-picturesque design for the merest architectural commonplace.

At the close of the paper the President thanked M. Lucas in the name of the meeting, and invited the members of the Congress to meet at Passy to inspect the Lycée Janson, at present in course of construction.

About 150 architects joined in the visit to the builder's yard at the Lycée, which occupies, at Passy, a vast irregular quadrilateral area, of about 40,000 square metres. M. Laisné, government architect, here received his professional brethren at about half-past four, at the principal entrance in the Rue de la Pompe, and conducted them successively over all the seven courts around which the constructions are disposed: the "Cour d'honneur," two "Cours pour les exercices militaires," "Cour des humanités," "Cour des grands," "Cour des moyens," and "Cour des petits." The buildings, widely spaced, and having for the most part only one storey above the ground-floor, leave opportunity for free circulation of air everywhere around the buildings, which comprehend on the ground-floor the amphitheatre, class-rooms, studies, covered gymnasium, refectories and chapel, while the first floor is almost entirely devoted to dormitories. The buildings, which occupy about 9,000 square metres, were commenced in October, 1881, and will be partially open for use in October, 1884; the cost, exclusive of the site, will be about 7,000,000 francs, and the new Lycée will accommodate about 500 boarders, 250 semi-boarders (demi-pensionnaires), and 250 day scholars. The whole building will be heated by steam (on the Geneste and Herscher system) from one generator; and special ventilation tubes are provided with gas-burners to ensure a current. As to the general style, it is very sober, effect being chiefly obtained by the judicious use of the colours of the various materials employed, consisting of stone and brick, with rustication of part of the stone surfaces. The admirable finish of execution of every part is to be noted, due to the constant attention of the architect, M. Laisné, the inspector, M. Deménioux, and the admirable direction of the masons' and joiners' workshops by M. Turcotti, the contractor.

On Tuesday, the 10th, a visit was paid to the Paris sewers. At half-past nine a.m. about eighty architects, of whom more than twenty were strangers to Paris, descended, at the foot of the Colonne Châtelet, into the vast collecting sewer which takes its course along the Rue de Rivoli towards the Place de la Concorde, and the party, sometimes on platforms, and sometimes in boats, arrived at the extremity, from whence on foot they betook themselves to the Pont d'Alma, to study the siphon system which assures the continuity of the flow, under the Seine, of the sewer waters from the left bank into the collecting sewer on the right bank. Thus the French architects showed the same enterprise in going through the sewers at their Congress which the members of our Congress showed in penetrating the perhaps equally uninviting tunnel of the Underground Railway extension.

At midday of the same day the second meeting of the Congress was held at the École des Beaux Arts, the chair being taken by M. Sauvage, the President of the Société Régionale des Architectes du Nord de la France, the assessors being MM. Questel, Bresson (delegate of the Société Académique de l'Architecture de Lyons), Sabouraud (delegate of the architects of La Vendée), Paul Wallon, and Th. Labrousse, honorary architect of "l'Assistance Publique." After some complimentary votes to the architect of the Lycée, and to the Director of Public Works and others who had facilitated the visit to the sewers, the secretary invited members to inscribe their names for the visit to Blois

and to Gennevilliers, for which it was necessary to make arrangements beforehand; and the President then called upon M. Paul Sedille, lauréat "de la Société de l'Architecture Privée," to read his paper on modern architecture at Vienna.

M. Sedille said that his observations were the summing-up of a more extended "étude" which was soon to appear in the *Gazette des Beaux-Arts*, illustrated by a certain number of engravings after drawings which were exhibited in the meeting-room, and which comprised, among others, three original sketches by Chapu, the sculptor; plans on a small scale of the principal modern public buildings of Vienna, and some photographs of buildings and of the principal streets and avenues of new Vienna. This city had been entirely transformed since the demolition of the ancient fortifications, and if it had not taken much care of the monuments of the Middle Ages and the Renaissance (excepting its old cathedral of Saint-Étienne), or of the Jesuit work of the seventeenth and eighteenth centuries, it had, on the other hand, erected, with great eclecticism of taste and style, a considerable quantity of public and private buildings flanking new streets, the result in most cases of competitions widely advertised, and under the auspices of Viennese architects of reputation—Hansen, Ferstel, Schmidt, Willmans, Vandernüll, and let it be added, with the immediate patronage of the Emperor Francis Joseph, of the archdukes, and of the municipality. M. Sedille gave an able and interesting critical view of modern Viennese architecture, a translation of part of which we shall be able to give next week, and concluded by noticing the work there by some French architects, M. Destailleur, who was constructing a hotel in the Louis Quatorze style for Baron Albert de Rothschild, and M. Girette, who, on a site of about 23,000 metres in area, was about to construct a palace for the Baron Nathaniel de Rothschild, for the decoration of which he had called in the aid of the French sculptor, Henri Chapu.

The President thanked M. Sedille for his valuable communication, and said he would only detain the meeting with this remark, that at Vienna, as well as at Brussels, and almost all other capitals, the regulations for street building were much more liberal than at Paris, and he asked if a future Congress ought not to give its attention to formulating a project to be submitted to the Administration to obtain more latitude in favour of the builder, and also more chance of embellishment of the public streets. The President then called on M. Chas. Lucas to read a notice on the life and works of the late M. Antoine Chenavard, of Lyons, a biographical study partly founded on previous memoranda by architects of Lyons in regard to their deceased confrère, from which we extract the following passages bearing on the place of Chenavard in the Académie, the monuments which he designed, and the foundation of the "Société Académique d'Architecture" at Lyons.

Chenavard, said M. Lucas, came to Paris towards 1804, and went through the regular course of study at the Académie, having for his preceptor Professor Barthélemy Vignon, and for fellow-students, Caristie, Gilbert, Ingres, and some other masters who have now departed, but whose names are still dear to us. France was then inaugurating her Imperial era; and, at the last visit he paid to us, ten years ago, Chenavard, reverting to his recollections of that period, brought before us, with great lucidity and eloquence, the magnificent display made by the Empire, then in its dawn, for the fête at Notre Dame in honour of the consecration of Napoleon I. by the Pope Pius VII. Nevertheless, during the period of all this display of brilliant uniforms and military show, the teaching of the arts, too much under government supervision, assumed at Paris, under the inspiration of the eminent painter David, a turn towards the chastened, the cold, the severe in style; Egypto-Greek and Etrusco-Roman antiquity imposed themselves upon the students of art; and that kind of antiquity, despoiled after all of a great part of its charms, agreed very ill, it must be confessed, said M. Lucas, with our Gallo-Roman temperament, which it is difficult to confine for long in this manner. And thus Chenavard, with a lively imagination, a very cultivated intelligence, poet and thinker as well as artist, accommodated himself but ill to the restricted régime; and at the present moment, when all kinds of

water-colour orgies ("débâches d'aquarelles") are permitted and rewarded in this same school, one may be permitted to quote, apropos of the pupil career of Chenavard, a characteristic page borrowed from the memoir which one of our comrades, Chenavard's last pupil, M. Chevot, of Lyons, has written of his master.

"Chenavard, when summoned to the competition for the Prix de Rome, and studying the design for a hospice of refuge in the Alps, which was the subject proposed, bethought himself, confiding in his skill as a water-colourist, to reproduce his hospice otherwise than in an Indian ink drawing, the sole procedure then recognised; and he had the unfortunate inspiration to represent natural conditions by showing the roofs of his building covered with snow. This boldness, this romanticism, so far in advance of his epoch, cost him dear; the drawing was mercilessly placed 'hors de concours,' and the road to Rome—the official road at least—was closed to him."

In a later portion of his paper, M. Lucas described one of the monuments which Chenavard had designed. You will permit me, he said, to pause before one of these tombs, that which he designed for his second daughter. She was the bond of union between the master and his favourite pupil, who succeeded him as architect-in-chief of the department of the Rhone. This monument is a small square column, with an Ionic capital; the volutes are bound together by the lines of a necklace and string of beads, from which a cross drops to the foot of the colonnette; on the capital is placed a work-basket, from which escape netting and cord and bands of embroidery; below are albums of drawing and music, and on the whole a turtle-dove is sleeping.

The circumstance of the foundation of the Société Académique d'Architecture de Lyons furnishes us with the following details:—

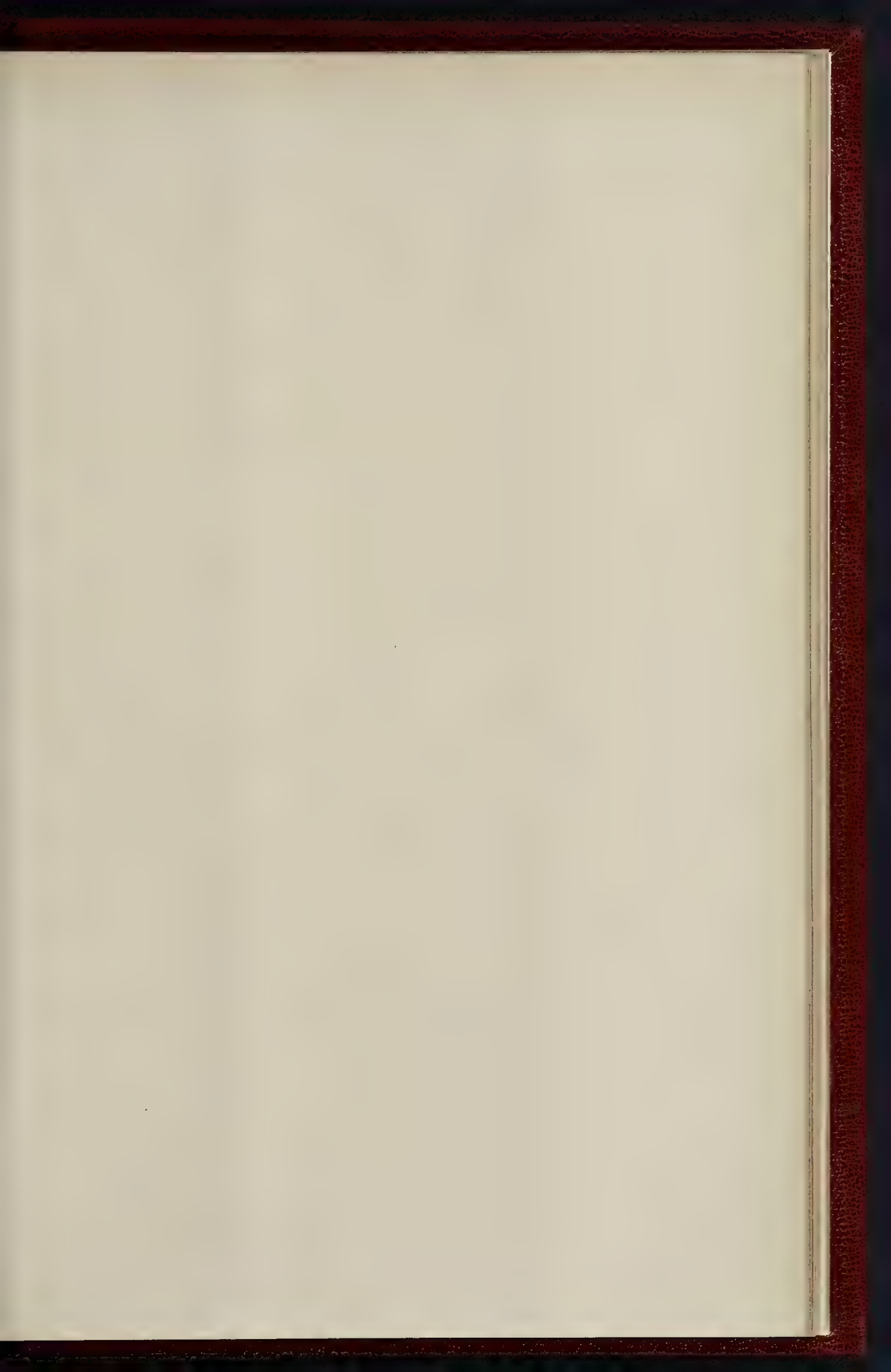
While he was living at Paris, under the First Empire, Chenavard had not been inattentive to the talk of his masters, in his presence, about the Société Académique then existing in that city, and which was composed specially of architects of civil structures resident in Paris, attached to the Ministry of the Interior, and all charged by the Government with the construction of public edifices. On the 18th December, 1829, Chenavard, already architect of the Department of the Rhone since 1818, and Professor of Architecture at the École des Beaux Arts of Lyons since 1823, associated himself with eighteen Lyonsese architects to found, on statutes analogous to those of the old Société de Paris, the Société Académique d'Architecture de Lyons, whose handsome volumes of Transactions are well known to us, full as they are of interesting facts in regard to architecture and archaeology, and displaying incessant solicitude in regard to all questions touching the honour and dignity of the profession.

After a vote of thanks to M. Lucas from the meeting, and a special recognition from M. Bresson, the delegate of the Society at Lyons just referred to, the second day's Congress terminated.

TOMB OF THE DUC DE BRÉZÉ, ROUEN CATHEDRAL.

This fine Renaissance monument is situated in the Chapel of the Virgin, behind the high altar in Rouen Cathedral. It is to the memory of Louis de Brézé, Grand Marshal of Normandy, and the husband of Diana de Poitiers. Her statue, half seen in our view through the interspaces of the columns, kneels near the head of the corpse-like figure of the subject of the monument,—a figure which is an example of that strange and uncouth fancy, to be found occasionally in Medieval as well as in Renaissance monuments,* of depicting the deceased person in all the realism of death, sometimes even of decomposition. The statue of the Duke above, on horseback, in his habit as he lived, is in striking contrast with the stiff figure below, and may serve as a precedent for that introduction of an equestrian figure in a church monument which seems to have alarmed the authorities of St. Paul's so much in the case of the Wellington Monument. The work belongs to the best period of French Renaissance, before its details became twisted and tortured out of shape, meaning, and proportion in the licence of the later styles.

* There is a remarkable example, it will be remembered, in the choir at Tewkesbury.



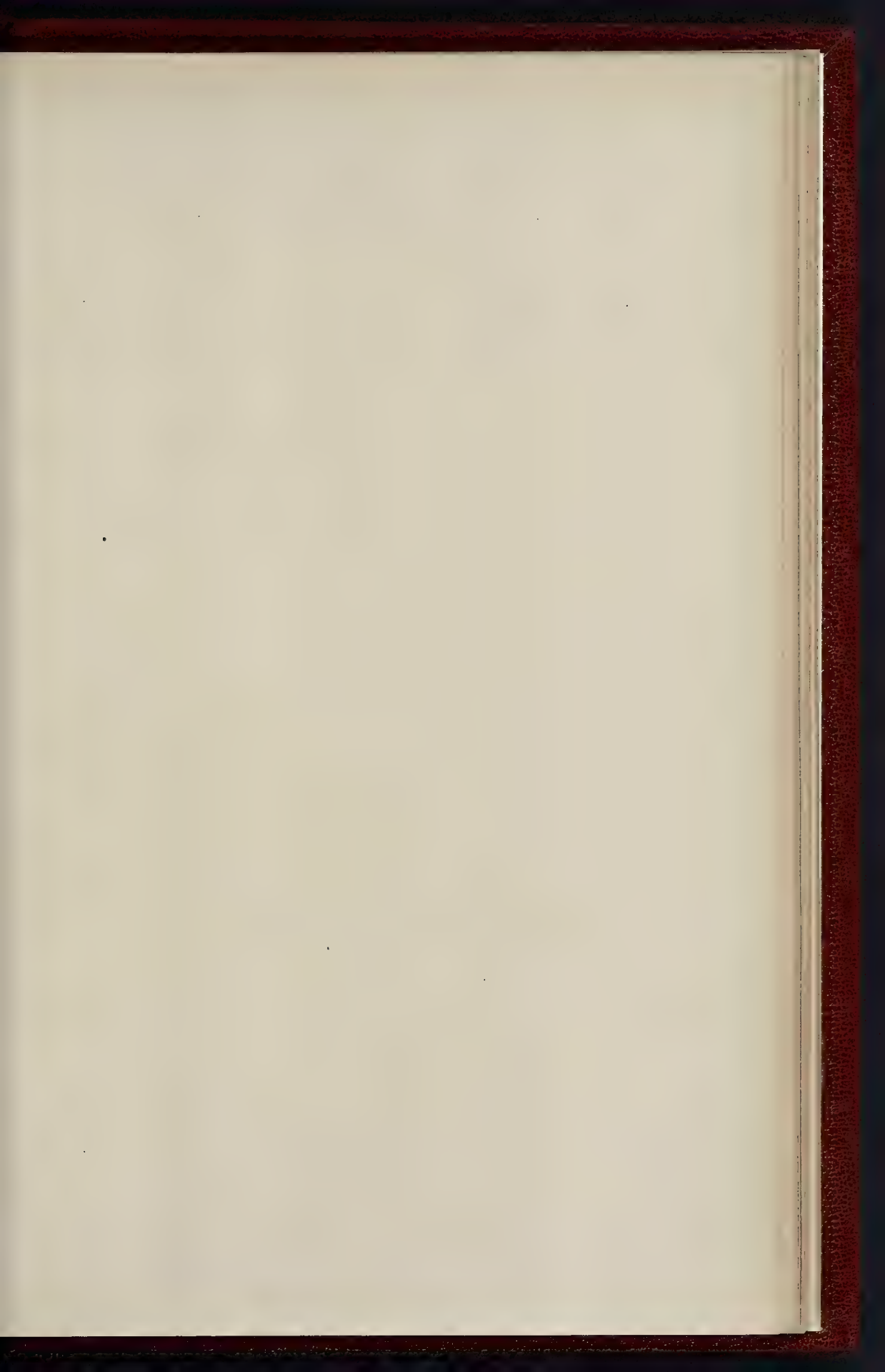


Wyman & Sons Photo Litho

FRANÇON, BIARRITZ: FOR MR. J. P. MELLOR.—



Green & Co. N.Y.

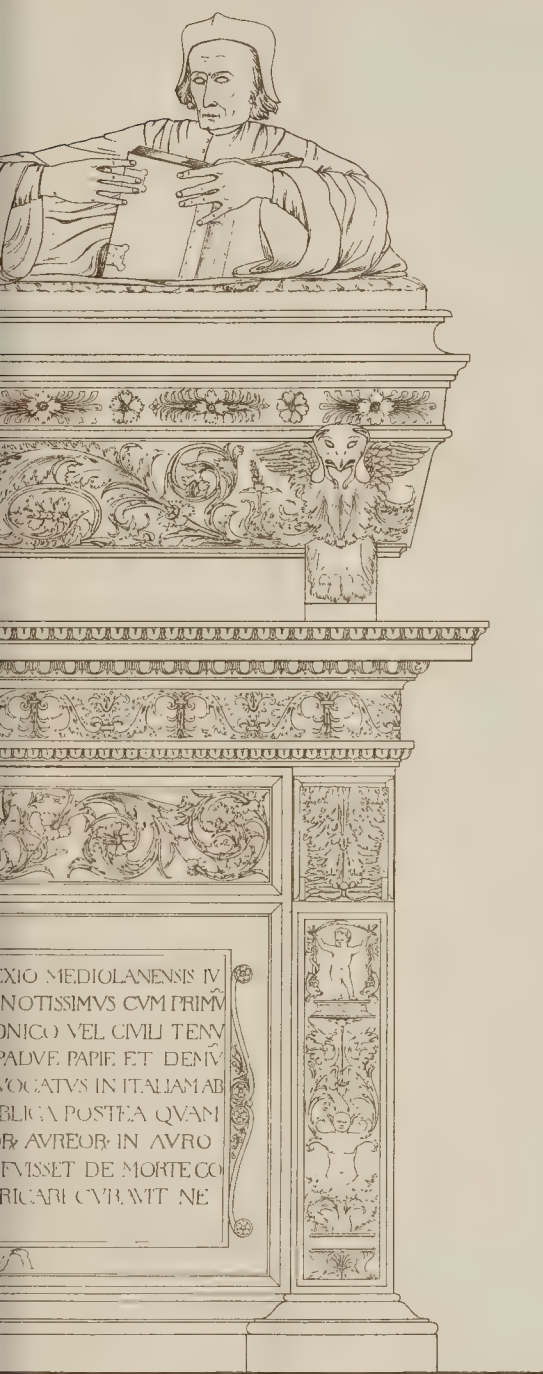


CAMPO SANTO PISA

*Tomb of Filippo Decio by Stagio Stagi Date about 1530**Measured and Drawn from Cast in S. Kensington Museum**Section*

PHILIPPVS DECIVS SIVE
 RISCONSVITVS CELEBR
 LOCVM STVDII IN IVR
 ISSET PISIS SENIS FLORE
 VLTRA MÔTES IN GAI
 EXCELSA FLORENTINO
 STIPENDIVM MILLE QN
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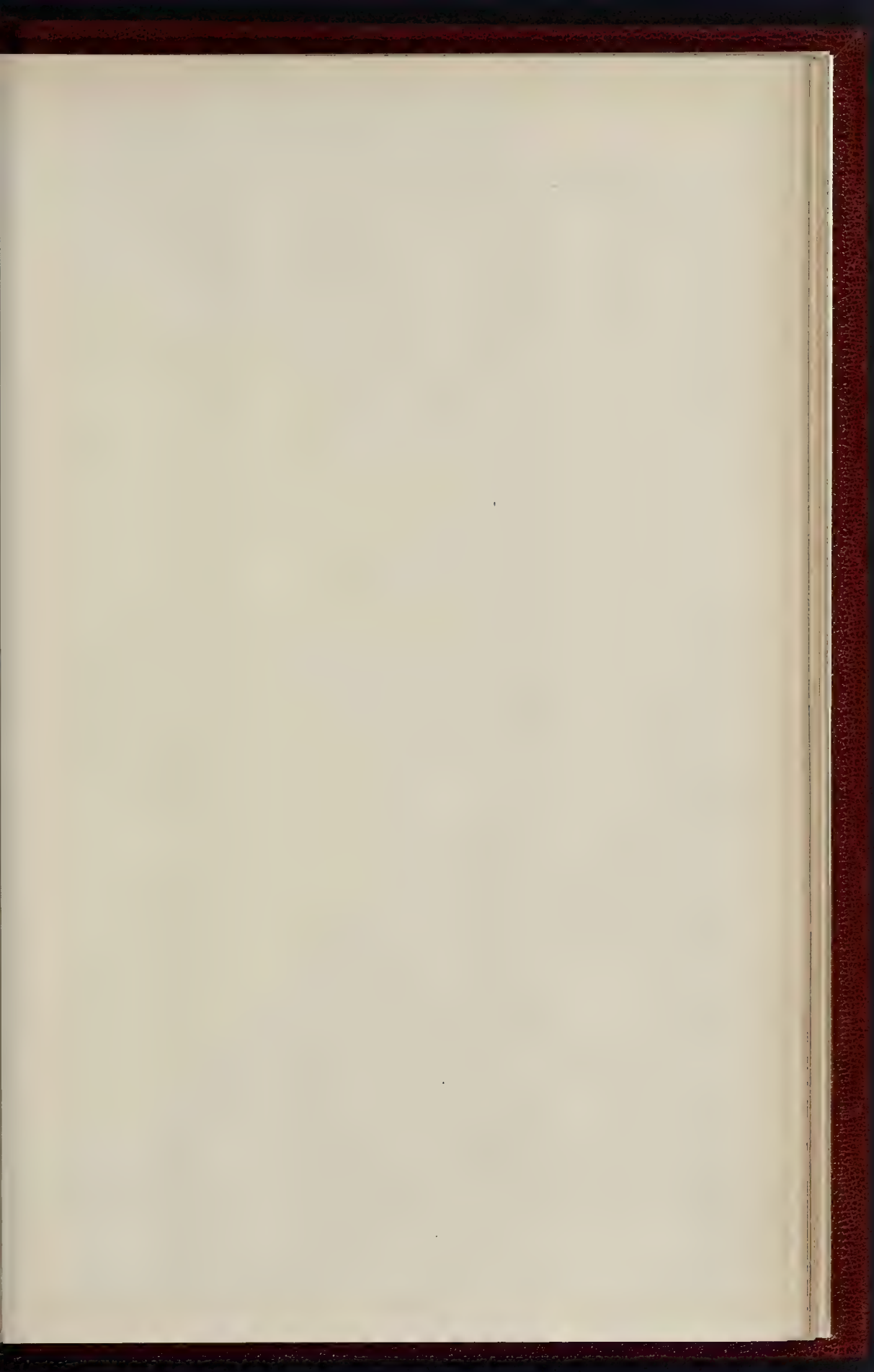
Elevation

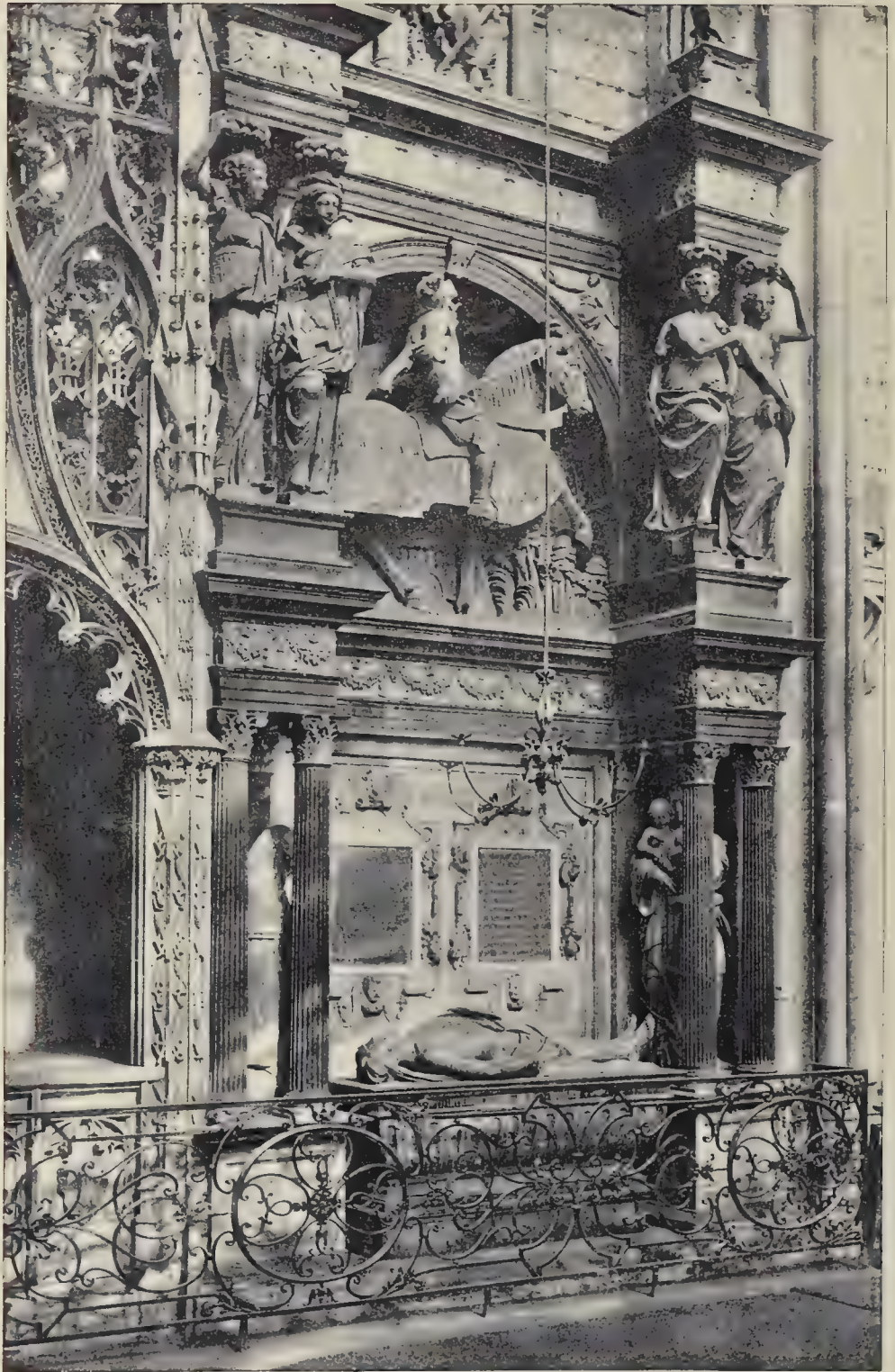
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Side

4/10 J. P. de la H.





THE PHOTOGRAPH BY J. & C. LONDON.

TOMB OF THE DUC DE BRÉZÉ. ROUEN.



SCULPTURE AT THE ROYAL ACADEMY.
No. 5.—"AVE CÆSAR, MORITURI TE SALUTANT."
By MR. G. A. LAWSON.

HOUSE AT FRANÇON, BIARRITZ.

FROM Françon, near Biarritz, the property of Mr. J. Pennington Mellor, a magnificent panorama of mountain, sea, and sky is to be seen, the situation at the foot of the Pyrénées and sloping up from the gulf of Gascony being unusually beautiful. The house has been designed in order to obtain for its inhabitants as much of the prospect as is possible: hence the verandahs and terraces which shade from the sun and give eyelashes to the observer, and hence the towers seen for miles around, and from which, stretching far away to the south-east, can be seen on a clear day the Pic du Midi, queen of the Pyrénées. The house is built of hard stone, cemented up to the first floor, and the upper portion is of half timber, like the Basque cottages. The windows are narrow, in order to permit of their being closed by the very necessary *persiennes*, and the walls are in some parts 3 ft. thick, to keep out the midsummer heat. Dominique Morin, of Biarritz, carried out the work, from the designs and under the direction of Messrs. Ed. Salomons & R. Selden Wornum, of London.

TOMB OF FILIPPO DECIO: CAMPO SANTO, PISA.

THE drawing of this is one of those by Mr. Oneshott which gained him the Architectural Association Travelling Studentship, and which we named with praise two or three weeks ago. The drawing is made from the facsimile in the South Kensington Museum; the details of the graceful scroll ornament we will give on a larger scale next week. The inscription, which is rather oddly abbreviated Latin, conveys the information that Filippo Decio was celebrated as having attained a foremost place in the study of canonical and civil law, and had proved his abilities not only at Pisa, Sienna, Florence, Padua, &c., but even "ultra montes" in France, whence he was recalled to Florence to take a lucrative position as lecturer or professor. The decoration of the tomb is in the most beautiful and refined style of the best period of Italian Renaissance, the reproduction of it forming one of the most attractive features of the architectural court at South Kensington.

SCULPTURE AT THE ROYAL ACADEMY.
NO. 5.—"AVE CESAR; MORITURI TE SALUTANT."
BY MR. G. A. LAWSON.

MR. LAWSON'S figure represents a *retarius*, or gladiator, who fought with the help of a net in which he endeavoured to entangle his adversary; the net, hanging down by the figure, assists in giving mass and breadth to the design. The fighter is supposed to be just turning to pay his homage to the occupants of the "Royal Box" before engaging with his opponent. The figure forms a prominent object in the lecture-room at the Royal Academy, and as a study of the nude figure in an antique subject, forms an effective contrast to Mr. Thornycroft's realistic subject from modern life, which stands parallel with it, and which we will illustrate next week.

HEALTH EXHIBITION CONFERENCES.*
INDUSTRIAL DISEASES.

AT the Conference held on Wednesday, the 13th inst., in the new Conference Hall at the Exhibition, the chair was taken by Mr. Edwin Chadwick, C.B. "Industrial Diseases" was the subject announced for discussion, and an exhaustive paper was read by Dr. John Syer Bristowe, F.R.C.S., M.D., Officer of Health for Camberwell, upon the diseases to which those engaged in the various industries are liable.

Dr. Bristowe, after some introductory remarks, went on to say that one of the most interesting groups of industrial diseases was that in which injurious effects arose from the slow action of metallic or other inorganic substances or their derivatives on the system. Metallic lead was probably inert, and even its salts, though generally regarded as poisons, might, for the most part, be taken, even in large quantities, without material injury. It was very different, however, with respect to the salts of lead habitually received into the system, even in minute proportions. It would be diffi-

cult to enumerate all the conditions under which chronic lead poisoning was apt to occur. All those who had to do with metallic lead, such as lead miners, plumbers, type-founders, and manufacturers of lead toys, occasionally suffered. All persons concerned in making glass, in glazing pottery and the like, in which operations the oxides of lead were employed, were liable to become affected. But the chief sufferers were those who manufactured, or employed in their work, the carbonate of lead; especially, therefore, painters, plumbers, glaziers, glazed-card manufacturers, and lacquerers. It was important to note, however, that lead poisoning was not limited to operatives in lead, but that, owing to the extensive employment of this metal and of its derivatives, the general public were by no means free from danger. The symptoms of chronic lead poisoning were for the most part very striking and generally unmistakable. Lead colic was usually the earlier in its advent. It was characterised by intense gripping abdominal pain, coming on in paroxysms and associated with hardness and retraction of the abdominal muscles, nausea or sickness, and almost insuperable constipation. Lead palsy, in its simplest form, extended the wrists, the thumb, and the first joints of the other four fingers, so that when the fore-arm was held out prone, the hand dropped powerless at the wrist, and the fingers drooped so as to form nearly a right angle with the rest of the hand. The affected muscles rapidly wasted. The palsy was not in all cases confined to these muscles. Sometimes the upper arm suffered, sometimes the muscles of the leg were implicated, and occasionally the muscles of the trunk, including those of respiration, were involved. But besides these chief consequences of chronic plumbism other phenomena due to the same cause were observed. The victims of lead poisoning became disproportionately liable to gout, and persons of gouty tendency were specially prone to suffer from exposure to lead. The immediate cause of the various phenomena was the entrance of lead in some form into the system. The poison gained access, either by the respiratory organs, owing to the inhalation of vapour or dust; or by the stomach, in consequence of the impregnation of food or drink, or possibly in certain cases by cutaneous absorption. In most instances the injurious effects of lead were readily recovered from if the remedies were taken early, and if the sufferer gave up the employment which exposed him to danger. If, however, he persisted in exposing himself, either the colic might prove fatal or paralysis become established and spread; and, finally, he died from the effects of cachexia, from extension of paralysis to vital parts, or from the supervention of symptoms of cerebral disease. It was, probably, impossible that workers with, at any rate, some forms of lead, should be rendered wholly free from liability to lead-poisoning. It was clear that much might be done to minimise danger. The first principles to be observed in lead-works were the inculcation of cleanliness, avoiding eating with unwashed hands, or in working-clothes, or in workshops; moist-grinding; free ventilation; precautions against dust rising, or wearing flannel respirators when this was unavoidable, with occasional doses of sulphate of magnesium, acidulated with sulphuric acid. Similar precautions should be taken by painters and all who were habitually exposed. Pure copper was, like pure lead, probably inert, but copper salts were much more poisonous than those of lead, and acute poisoning was likely to end fatally. It was somewhat curious, therefore, that characteristic poisonous effects from the long-continued absorption of cupreous compounds were not nearly so common as those due to lead. It was certain that copper salts gained entrance into the system by the same routes and methods as lead salts, that they became deposited in the tissues, and that a characteristic greenish or purplish hue, somewhat resembling that due to lead, was apt to appear at the edge of the gums. Brass-founders were subject to periodical febrile attacks to which the name of "brass-founder's ague" had been given. It was held that the symptoms were due not to copper, but to the zinc or arsenic which was combined with the copper. Those exposed to danger of copper-poisoning should adopt the precautions of cleanliness specified in the case of lead. Chronic arsenical poisoning was not uncommon in consequence of the inhalation of arsenical vapours

or arsenical dust. Those chiefly exposed to this form of poisoning were persons employed in the manufacture of pigments, paper-hangers and decorators, artificial flower manufacturers, milliners, persons exposed to the fumes of heated metals, particularly zinc and brass, manufacturers of dyes, and leather-dressers. Persons living in rooms papered with arsenical paper were very liable to suffer. The substance to which chronic poisoning was mainly due was arsenite of copper, commonly known as Scheele's or emerald green, which was formerly largely used as a pigment and was still thus used to some extent. No doubt among arsenical workers cleanliness was of great importance; not improbably, improvements in process of manufacture might be made beneficial to the workpeople, but those specially liable to suffer would do wisely to escape danger by avoidance. Chronic mercurial poisoning occurred among the workmen who were habitually exposed to the vapour or dust of mercury, or its salts, especially, therefore, amongst those employed in quicksilver mining, water-gliders, the manufacturers of looking-glasses, barometers and thermometers, furriers and persons engaged in the packing of furs, which had been brushed over with solution of nitrate of mercury. In order to prevent the occurrence of mercurial tremor perfect cleanliness and good ventilation should be observed. Chronic phosphorus poisoning was a disease to which those were subject who were largely exposed to the fumes of phosphorus, and was generally confined to those whose duty it was to dip matches in melted phosphorus paste. Owing to the precautionary measures which had been adopted, and especially to the extensive use of amorphous phosphorus, which yielded no injurious vapour, the disease had almost disappeared from this country. Occupations which habitually exposed workmen to the inhalation of abundant solid particles that were incapable of solution or removal by the animal tissues or secretions in many cases induced chronic diseases, which were known as the asthmas or consumptions of the several occupations. Workers in coal-mines and copper-mines, grinders, millstone makers, and flax-dressers were especially liable to suffer. Dr. Bristowe next alluded to phthisis in connexion with sedentary work, showing that it was largely due to bad ventilation. With regard to the spread of infectious fevers, he found that the only disease that was ever spread by native rats was small-pox. There were many reasons for the comparative safety of the rag trade. Anthrax fever, or splenic fever of cattle, was a very fatal bovine disease. The chief sufferers were those who had to handle raw hides from abroad. Other diseases which he thought might fairly be called industrial diseases were the so-called "clergyman's throat," and "writer's cramp," or scrivener's palsy.

In the course of the discussion, Dr. Ord, in speaking of the diseases to which milliners and dressmakers were subject, said they were due in a great measure to the conditions of their occupations. Among these were the elements of overcrowding and ill-ventilated rooms. Domestic servants suffered much from want of sufficient fresh air and deficient ventilation.

Dr. Grantham remarked that lung diseases were by no means confined to workers in factories or miners, but in this large city there were numerous mechanics exposed to causes producing diseases of the lungs. Printers of coloured materials, stainers and paperhangers, and chaff-cutters, suffered by reason of their occupations.

Dr. Vacher observed that in the Birkenhead district flour-millers, bakers, masons, and others would derive great advantage if compelled to properly ventilate their workshops.

Dr. Ogle read a number of statistics bearing on the death-rate in various industries. The mortality among painters, glaziers, and plumbers was high, probably in consequence of their being so liable to lead-poisoning.

Dr. Dickson spoke of the symptoms of lead-poisoning in the muscular parts of the arms and other parts of the body being sometimes very obscure. The lead-workers also suffered from dyspepsia.

Mr. Liggins drew attention to the fact of there being numerous deaths from chest diseases in the Royal Navy through unnecessary exposure of the chest.

The Chairman, replying to the last speaker said the death-rate in the Royal Navy was 4½

* For reports of preceding Conferences see *Builder*, pp. 819, 871, 881.

in the 1,000 as compared with 18 in the 1,000 in the Mercantile Marine. He also mentioned the desirability of workshops being visited regularly by medical officers of health who could perceive the premonitory symptoms of disease in the workpeople. The children employed in factories and similar places should be followed to their homes with the object of ascertaining the conditions existing there.

THE SPREAD OF INFECTIOUS DISEASES.

The Conference meeting held on Thursday, the 14th inst., was presided over by Dr. Alfred Carpenter, chairman of the Council of the Sanitary Institute.

Dr. Thrusfield, Medical Officer of Health for Camberwell, read a paper "On Cow's Milk as a Vehicle of Infection and Epidemic Disease to the Community, with Suggestions for the more effectual Prevention of such Outbreaks." He observed that, making allowance for all doubtful cases, it might be accepted as an absolute fact that epidemics of typhoid and scarlet fever had been repeatedly disseminated by milk, while there was strong evidence that diphtheria had also been disseminated. To confer immunity from infection milk should be boiled. The precautions recommended in the case of milk-shops were those generally adopted by urban sanitary authorities, with the addition that upon the occurrence of any infectious disease among the employees such should be notified at once to the proper authorities.

Professor Corfield next read a paper entitled "How infectious Diseases are spread." The poisons of some of these diseases, he said, were more especially conveyed in the foul air of sewers and drains. Foul air escaping into the house was far more often the cause of mischief than when it was allowed to escape into the open air, but he had known one undoubted instance in which a person contracted enteric fever from the emanations from a blocked-up drain which was open outside the house. There was no question of contaminated water supply, but it was shown how the poison got into the drain, and the servant who contracted the disease was in a feeble state of health. The foul air from sewers and drains got into houses through defective drains, soil-pipes, and other imperfect sanitary apparatus. It was not at all uncommon in houses to find bell-traps in the basement-floor leading directly into the drain, and this into the main sewer. These traps when disused became perfectly dry, and allowed the passage of sewer air into the house, only partially obstructed by the dust and dirt which collected in the trap. Foul air was capable of eating holes in unventilated lead soil-pipes and traps, and the holes so formed allowed the sewer-air to find its way through numerous small fissures and holes in the brick-work or plaster into the house continuously, but more freely at night, when the doors and windows were shut and the fires lighted. Drinking-water was also a most facile vehicle for the conveyance of the poisons of some of these diseases. Cholera and enteric or typhoid fever, with dysentery, in hot countries, were especially spread by this means, and there was also evidence that diphtheria might be spread in the same way. The poisonous emanations from the patients got through leaky drains and cesspools, through pervious soils into the wells, or the foul air from such drains and cesspools was carried by sewer-air into the cisterns in which drinking water was stored, through improperly-arranged overflow or waste-pipes connected with the drains, or through soil-pipes or water-closet apparatus, direct into the house; or they were conveyed by sewers and drains into water-courses, which were afterwards used for the supply of drinking-water. Dr. Snow traced cases of cholera to polluted water in 1849, and again when, in 1854, the celebrated outbreaks in the case of the pump in Broad-street, Golden-square, took place. The evidence was so complete that Dr. Snow was justified in saying, "Whilst the presumed contamination of the water of the Broad-street pump, with the evacuations of the cholera patients, affords an exact explanation of the fearful outbreak of cholera in St. James's parish, there is no other circumstance which offers any explanation at all, whatever hypothesis of the nature and cause of the malady be adopted." Succeeding epidemics had been traced to the same source, and Dr. Snow's dictum had been found to be true in each instance, and in fact he

said, "Each epidemic of cholera in London has borne a strict relation to the nature of the water supply of its different districts, being modified only by poverty, and the crowding and want of cleanliness would always attend it. In London, and many other large towns, disease was chiefly spread by the pollution of water, by means of sewer-air containing the poison of the disease, which found its way into the cisterns through overflow or waste pipes connected (as they should never be) with the drain or soil pipes. It was thus impossible to trace the disease from one house to another. There could be no doubt that while enteric fever was generally contracted by means of polluted water, and occasionally by polluted air, diphtheria was generally contracted by means of polluted air, and only occasionally by polluted drinking-water. He had known instances of some of these diseases breaking out in houses where there were traps in the floor of the larder connected with the drains, or defective soil-pipes in the walls. Foul air, which got into larders through the runs which rats made from the drains, and thus the food became contaminated. Lastly, the poisons of some of these diseases might be said to infect the ground, hence the quasi-miasmatic character attached to them, which had misled so many observers as to their true mode of spreading."

Professor De Channont, F.R.S., agreed that milk had often been the medium of spreading typhoid and enteric fever. He referred to an outbreak of typhoid at the Southsea Barracks, which was caused by the sewer air being driven up the drains by the sea. Since alterations had been made in the drainage, there had not been a single case of typhoid. In Germany there were a number of scientists who insisted that in no instance did water propagate disease.

Dr. Walford considered that little could be done until the public were educated in sanitary matters. It was sometimes asked whether the people of the present day were better off in regard to sanitary matters than their forefathers, and he would like to refer to the sanitary condition of Chester one hundred years ago. The population was then 14,700, while the number of deaths was 546 in one year. Of these 202 were due to small-pox alone, while the death-rate from the remaining diseases was 24 per 1,000. There was nothing new in sanitation; the earliest medical officer of health, and perhaps the best, was Moses. The principles laid down by him were of the very best, though unfortunately they were better fitted for dwellers in tents than for residents in large towns. Cyrus fully understood the value of pure water, only drinking the produce of one particular river, and that boiled.

Dr. Priestley, as a physician, was appalled at the ignorance of sanitary matters, and the indifference displayed by people in regard to the spread of disease.

After some further discussion, the meeting terminated.

THE NOTIFICATION OF INFECTIOUS DISEASES.

At the meeting of the Conference on Friday, the 13th inst., Earl Fortescue, vice-president of the Parkes Museum of Hygiene, presiding, papers were read by Dr. Alfred Hill, Medical Officer of Health for Birmingham, on "The Notification of Infectious Diseases: its Importance and its Difficulties"; and by Dr. Alfred Carpenter, J.P., chairman of the Council of the Sanitary Institute, on "The Right and Duty of the State to enforce it."

The Chairman, in opening the proceedings, said he concluded that he held the position he had the honour of filling in connexion with the Parkes Museum, and also that which he occupied on that occasion, to his past labours, and he might add, his sufferings in the cause of Sanitary Reform. He had found it impossible to continue with failing health and sight, the labours which he had previously carried on in an unpaid and thankless office, but he was anxious to testify to his unabated attachment to the great cause of Sanitary Reform, and his strengthened interest and unimpaired conviction of its important bearing not only upon the physical and the moral, but, he might add, religious condition of the people. In the matter of sanitary reform it was inevitable that individual liberty and the rights of property must to a certain extent be interfered with for the public good. He should listen attentively to the arguments which would be

used for and against a wide but by no means unprecedented interference in these respects by the notification of the existence of infectious diseases which would be proposed that day. He would say no more than this, that it was for the advocates of compulsory interference with individual liberty and the rights of property to make out a case justifying exceptional legislation for that purpose. Liberty itself was so very precious a possession that it ought not lightly to be curtailed, and confidence in the security of property was so indispensable to the development of thrift,—self-denying thrift,—and industry for the production and the retention of capital, that it ought not lightly to be shaken or alarmed. It was to be remembered that it was better to tolerate a certain amount of inconvenience, and even of suffering, than lightly to interfere by over-legislation, imperial or local, with personal liberty or property. Multiplied official interference required multiplied officials and offices to be filled, and in spite of the judicious establishment of competitive examinations, a very large proportion of official patronage would inevitably fall into official hands, and some of it was likely to be given away for political services.

Dr. Alfred Hill, Medical Officer of Health for Birmingham, then read his paper. He argued that in order to prevent the spread of disease, and the possibility of one or two cases developing into a widespread and fatal epidemic, a knowledge of the existence of first cases was indispensable. There was only one way of obtaining such knowledge, and that was by means of notification,—making the existence of the disease known to the proper person or authority. Dr. Hill combated the alleged objections to compulsory notification by the medical attendant, which objections, he said, constituted the chief obstacle or difficulty with which the advocates of notification had to contend. It was a remarkable fact that out of thirty-eight towns in Great Britain which had availed themselves of compulsory notification, thirty-four had adopted the system of direct notification by the medical attendant, while thirty of them required notification also by the occupier; in three only did it rest with the medical man to notify indirectly, or to the occupier, so that the dual system was found to be by far the most in favour. It was theoretically the only efficient one, and in practice it had been found to work satisfactorily. He believed it was one which commended itself to all impartial minds, and to all persons of experience.

Dr. Alfred Carpenter, in the course of his paper, expressed himself strongly in favour of dual notification. No one, he urged, could read the reports of the medical officers of health in all parts of the kingdom without coming to the conclusion that the greatest spread of infection was brought about by those cases which were not under orthodox medical care at all, and that notification by the medical profession alone would not effect the object, but rather lead to ignorant attempts to smother up the evidence, and in the end to raise up more persistent and more wide-spread outbreaks. There was a necessity in the minds of medical officers of health for dual notification. As regarded compulsory legislation, Dr. Carpenter was in favour of trying to get a general Act which should apply the same law to infectious diseases as now applied to contagious diseases among animals. Let them see the result of the general application of such a law, and if after a time it was found to fail in its effect, there would then be a sufficient reason for placing penalties upon a whole profession for not performing that which could only be viewed in the light of a moral duty. To place the power of prosecution in the hands of a fellow practitioner would be wrong, and he would urge that in such a case a prosecution should only be instituted with the consent and by the action of the Medical Council of Great Britain, so as to get rid of the possibility of professional rivalry and vindictive or malicious action on the part of a professional brother.

A long discussion ensued in which Dr. Blyth, Dr. Carpenter (Liverpool), Dr. Armstrong (Newcastle-on-Tyne), Mr. Young, secretary of the Society for the Abolition of Compulsory Vaccination, Dr. Mahomet, Dr. Dudfield, Mr. James Bailey (secretary of the Vigilance Committee), Dr. Nelson Hardy, Professor Corfield, and Dr. Charles West took part.

The Chairman, in summing up, expressed the opinion that a case had been made out for the compulsory notification of infectious diseases,

but so much difference of opinion existed among the medical profession that he did not think a case had been made out for compelling medical men to do more than warn the householder of the true state of the case, holding him (the householder) responsible for giving the necessary information to the sanitary authority.

A vote of thanks to the noble chairman was carried by acclamation.

THE DISPOSAL OF THE DEAD: CREMATION.

The sixth and last meeting of the series of conferences held under the auspices of the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, took place on Saturday, the 14th inst., when the chair was occupied by Sir J. McGarel Hogg, M.P., chairman of the Metropolitan Board of Works. Papers were read by Dr. A. Wynter Blyth, Medical Officer for Marylebone, on "The Disposal of the Dead," and by Mr. William Eastie, C.E., on "Cremation." There was a numerous attendance of ladies and gentlemen.

Dr. Blyth commenced his paper with the observation that the term "disposal of the dead," in its popular narrow limitation meant simply the disposal of human remains; but, taken in its widest significance, it included the disposal of everything which had life, whether vegetable, animal, or human. He should, however, confine himself to the methods of dealing with human remains. Those actually followed in civilised and uncivilised nations at the present time were simple exposure, so that, according to the climate, the body was wasted by the slow influence of the elements, or was consumed by insects, birds, or carrion-feeding animals. (2.) Burial in the ground in all its varieties. (3.) Burial in the sea. (4.) Burial in fire, i.e., fire-burial or cremation. (5.) Embalment, under which head might be included all kinds and methods of preservation. Simple exposure of the dead, either in special places like the *Parasætes* Towers of Silence, or desertion of the corpse, now only existed among a few races and tribes. He would therefore, pass on to earth-burial, the origin of which had been confidently ascribed to sanitary precaution, but the study of the habits and methods of thought of primitive man by no means countenanced that view. The custom of burial remained, but the beliefs under which it was first practised were extinct. They might surround burial with whatever religious ceremonies they liked, but, considered by itself, burial in the earth was no religious rite. Dr. Blyth went on to remark, in opposition to the ordinary method of inhumation in this country, that after death from infectious diseases, such as small-pox and typhus, a corpse, in addition to giving off the ordinary emanations of putrefaction, had been known to be terribly infectious. This was so to a less extent after death from measles, scarlet fever, typhoid fever, and pneumonia. If they continued to bury the dead the best process, to his mind, would be to bury one body in a grave at a minimum depth of six feet, to abolish the use of vaults, to allow no irremovable headstones or monuments over graves, and to cease, at the end of five years from the last burial, reversion to agricultural purposes. There were fatal objections to deep sea burial, which would be seen if they imagined over 800,000 corpses carried out yearly from our ports, the transit by rail, the delay in the stormy periods of the year from stress of weather, the liability to shipwreck; besides which there was the objection urged against cremation, that it too effectually disposed of the body, rendering certain crimes difficult of detection. As regarded fire-burial, cremation, or destruction, there were no grounds for believing that its origin was other than religious, although some writers had ascribed its practice to a sanitary forethought, which primitive races never possessed. The only objection to cremation was that the future identification of the dead, and above all, the discovery of organic poison in cases where murder had been committed, would be rendered impossible. The simplest way of meeting this would be to enact that any person desiring the cremation of his friend should give notice to the coroner, who would direct a medical man to at once make a post mortem examination, and upon his report, if favourable, the coroner would give his certificate for the cremation. As to embalment, Dr. Blyth said, it was a question, if vault interments were to continue, whether some modified form of embalment should not be rendered

compulsory, so as to lessen the risk of injurious emanations. He also suggested that there should be a reform in the matter of funerals, which should take place between 4 and 8 a.m.

Mr. Eastie followed with his paper on "Cremation." He thought the founders of the Cremation Society of England had chosen a very euphemistic term for the reduction of the body by fire by calling it "cremation" for the same sound was shared in France, Italy, Spain, and Portugal. The idea of cremation being preferable to burial had been upheld by Mr. Justice Kay and other judges. It was somewhat astonishing that it had taken so many years to prove to the public that this method of disposing of bodies was perfectly legal, as was decided by Sir Fitz-James Stephen during the late trial at Cardiff. Fortunately, misconception on this point had vanished, and now, provided the rite be decently performed, in a suitable place, no objection could be maintained. Some of the most eminent men known to science had erected a crematory building at Woking, which was able to fulfil all that science and hygiene demanded, and, possibly, as time rolled on, some cheaper method of cremation might be devised, but he did not think that anything was likely to supersede it as far as facility of working was concerned. By the present mode of earth-burial wells were poisoned, the air polluted, and disease resulted from the disturbance of the ground where it was hoped that epidemical disease was finally laid to rest, and Dr. J. Comyns Leach had described how it was possible that even the very worms which worked themselves through an infected spot of earth were capable of bringing to the surface those spores or germs which were capable of transmitting the specific disease. The population of a small town in Gloucestershire was decimated in 1843 by the dispersal of the superfluous earth of the burial-ground for manure by well-meaning authorities. Surely all this pointed to the necessity for a purifying fire to intervene between the dead and the living. The only tangible objection made to cremation was that it might, perchance, serve as a screen to poisoners, and prevent the disclosure of their crimes, but this objection could be overcome in many ways. The Cremation Society of England had published the conditions on which the employment of the crematorium would alone be permitted by the council. These conditions were:—(1.) An application in writing by the friends or executors of the deceased, unless it had been made by the deceased person during life, stating that it was the wish of the deceased to be cremated after death. (2.) A certificate to be sent in by one qualified medical man, at least, who attended the deceased until the time of death, stating that the cause of death was natural, and what that cause was. (3.) If no medical man attended during the illness, an autopsy must be made by a medical officer appointed by the Society, or no cremation could take place. Cremation societies existed in France, Holland, Sweden, Spain, and Portugal, and the utmost endeavours were being made to legalise the practice where nothing but burial in the earth was now recognised as legal. In America scores were formed yearly, and soon there would not be, possibly in the whole world, China and Turkey excepted, a country which did not adopt or permit fire-burial. As regarded the cost of burning a body, he did not think for some time to come it could be performed for less than 4l. or 5l., so as to pay for the services of attendants, for the fuel, and a respectable fee towards the wear and tear of the crematory; but he had no doubt when crematories abounded the cost of a cremation might be reduced to a sovereign, or even less, in the interests of the poor. Very much wiser than the people of today were the combatants of ancient Grecian times, who consumed their dead upon the field of battle, thus enabling them to bring the ashes home to the fatherland.

Dr. Cameron, M.P., in advocating the adoption of cremation, said he considered the disposal of the dead to be one of the most important subjects that could be discussed in the Health Exhibition. In England, Scotland, and Ireland the number of persons who were buried without any certificate or investigation as to the cause of death was as large as the number of persons who died in this metropolis in five months of the year. Dr. Blyth had suggested a moderate reform in the mode of burial, but the idea of utilising the dead for agricultural purposes, though not repugnant to his mind, looking at it in a scientific point of view, was

not likely to find favour with the public. It appeared to him very hard that any one who wished to be cremated should not be allowed to have his wish carried out. He could not see what right Government had to interfere with liberty of conscience in the matter. The Cremation Society proposed that the strictest precautions should be exercised, so that it would be impossible to have persons cremated whose deaths there was any ground for supposing had been caused by foul play. He had received a letter from a lady living in a fashionable part of London, stating that if she could be assured of her body being cremated death would be robbed of half its terrors. He had letters from many others in favour of cremation, and he claimed on behalf of the public that under proper precautions for health and safety, they should be allowed to exercise their judgment in the matter.

Sir Spencer Wells observed that in the country many of the burial-places were becoming very dangerous, and in the case of people living in large cities, they were in a much greater degree liable to infectious diseases from this cause. Then how great was the waste of land in earth burials. In course of time the dead would take the place of the living. It would be easy to prove that, putting aside the expense of the purchase of the freehold land, or the use of it for a certain number of years, the expense of cremation would be very small. The authorities of the City of London had taken up the question of cremation, and he was hopeful that the City would set a good example in the way of sanitary reform. The Bishop of Manchester was in favour of cremation, and many clergymen of the Church of England, and when it was understood that the ashes of the dead could be preserved and buried in the churches and other places where the deceased worshipped, a strong sentimental objection would be removed.

Dr. Farquharson, M.P., contended that public opinion was rapidly growing in favour of cremation. He had no doubt that it required considerable pluck for a person to leave instructions that his body should be cremated, on account of the knowledge that his friends or relatives would have to face a great deal of difficulty and obloquy in carrying out his wishes; but he had seen how rapid and successful the process was. The whole of Sir William Harcourt's argument was based on the assumption that Dr. Cameron's Bill was one for compulsory cremation, whereas it was only permissive in its character. He had no doubt that Dr. Cameron, who was as keen and energetic as he was able, would bring in another Bill on the subject.

The Rev. Brooke Lambert, vicar of Greenwich, advocated cremation. He considered that those who opposed it on religious grounds were not worthy of being heard. He was glad to be able to confirm Dr. Farquharson's statement as to the growth of public opinion in favour of this method of disposal of the dead.

Dr. Bartlett, public analyst, and Dr. Pringle, a medical officer in the Bengal Army, followed on the same side.

Captain Douglas Galton thought it would be long before cremation was universally adopted, and, therefore, he was of opinion that they should, as sanitarians, direct their attention to the desirability of increasing the number of mortuaries, so that it should not be necessary for dead bodies to be kept in houses. In connexion with all large blocks of buildings for the industrial classes, some such place should be provided.

Dr. Dudfield observed that a law was wanted in this country to render compulsory early burials, and that mortuaries should be provided where the bodies could be kept, to prevent the distressing scenes that might be witnessed in the houses of the poor, and the danger of infection.

Dr. Carpenter said that in cases where persons died of infectious diseases, such as small-pox, diphtheria, and scarlet fever, he would prefer cremation to burial.

Mr. Liggins protested strongly on behalf of the millions outside against the practice of cremation, which he believed was repugnant to their feelings.

Dr. Gibbon thought there was a great delusion as to the risk of infection from the graves. He believed a little earth spread over graveyards would do away with the danger.

Dr. Hodgson remarked that there could be no possible doubt that the present practice of

crowding graveyards was a source of injury to the living.

Mr. Smith thought that if the Cremation Society obtained the patronage of illustrious personages, that would have great influence over public opinion.

The Chairman, in closing the discussion, said he agreed with certain speakers as to the desirability of having mortuaries in the various districts of London, and of providing a suitable place for keeping dead bodies until burial, in connexion with blocks of buildings used as artisans' dwellings. He had now the pleasing duty of moving a vote of thanks to the Society of Medical Officers of Health, the Sanitary Institute, and the Council of the Parkes Museum of Hygiene for organising the Conference.

Dr. Dudfield acknowledged the compliment and moved a vote of thanks to the Chairman, who responded briefly, and the proceedings terminated with the intimation that all the papers read during this series of Conferences would shortly be published in *extenso*.

Other Conferences in connexion with the Exhibition will shortly be held. In the meantime a series of lectures has been commenced. On Monday last Professor J. P. Sheldon lectured on "The English Dairy." Particulars of other lectures will be found in our list of meetings on p. 911.

EXETER.

THE venerable Guildhall, which bulges out so curiously into Exeter's main thoroughfare, contains a number of very valuable old pictures. There are twenty or thirty of them altogether upon the walls of the council chamber and of the great hall, and their condition has, for some time, created no little concern amongst those who love the existing evidences of Exeter's historical associations the best. At a meeting of the Town Council which took place a few days ago, tenders were received for the restoration of these paintings. Messrs. Frederick Haines & Co., of 25, Fulham-road, S.W., offered to do all that was necessary (packing and cost of carriage not inclusive) for 152l. 5s., whilst W. T. B. Worth, of the Fine Art Gallery, Exeter, was ready to undertake the same work for 126l. After some discussion, the matter of deciding to whom the pictures shall be entrusted was adjourned until the next meeting. It is greatly to be hoped that such fine old historic paintings as is that of Princess Henrietta and the Duke of Albemarle will only be entrusted to skilful and competent hands. The Princess Henrietta was daughter of Charles I., and was born in Exeter in 1644. The present font in the cathedral was made purposely for her baptism. She married Philip Duke of Orleans, and died in early life a few days after the anniversary of her twenty-sixth birthday. Two years afterwards her brother Charles II. presented this picture (painted by Sir Peter Lely) to the Corporation of Exeter. That was in A.D. 1672. At the same meeting it was arranged that the foundation-stone of the new Pauper Lunatic Asylum at Digby, just outside Exeter, should be laid upon the 10th day of the coming month. The chairman and deputy-chairman of the building committee, Alderman Huxtable and Councillor Harry Hems were instructed to carry out the necessary arrangements. The building was illustrated in the *Builder* for Sept. 16, 1882, and is to be built from the designs of Mr. Robert Stark Wilkinson, architect, of 6, Farnival's Inn, E.C., by Mr. Henry Phillips, builder, of Exeter, at a contract price of 56,200l.; but as this sum does not provide for nearly all that it is now proposed to do, the amount will probably be considerably swelled, if not almost doubled. Some difficulty appears to have arisen in regard to payment for the 100 copies of bills of quantities printed for use when the job was tendered for. They contained about 160 pages of matter, and for them a bill of over 130l. has been sent in. The Council have signified that they entered into no contract for this printing, nor have they agreed to pay any specific sum for it, but they are willing to place the matter in arbitration, and to the judgment of a practical printer to be mutually agreed upon, and by whose opinion they are prepared to be guided. Mr. Wilkinson, who is son of the present Mayor, won the Exeter Asylum in competition.

THE ASSOCIATES OF THE INSTITUTE.

It will doubtless interest many of our readers to know that the Committee of Associates of the Royal Institute of British Architects, appointed at the meeting of Associates held in connexion with the recent Conference of Architects,* has exercised its powers to elect seven additional members.

The complete committee of twenty-one consists of the following gentlemen, viz.:

Herbert D. Appleton	John Malcolm
Thomas Batterbury	Hugh McLachlan
W. H. Atkin Berry	H. Percy Monckton
G. H. Blagrove	Thomas E. Mundy
S. Flint Clarkson	Charles R. Pank
G. A. Pryce Coxson	J. P. Power
Herbert A. Gribble	Richard M. Roe (Chairman)
F. H. A. Hardcastle	J. Osborne Smith
E. Early Holles	William Woodward (Vice-Chairman)
G. Richards Julian (Hon. Secretary)	Sidney Young
H. Hardwicke Langston	

The Committee meets fortnightly in the Arbitration-room, 9, Conduit-street, by permission of the Council of the Institute.

GAS ACCOUNTS.

MR. FIELD'S lucid analysis† of the accounts of the London gas companies for 1883 is printed on a page slightly larger than that used for the year 1882, an advantage which the reader will at once appreciate. The appearance of this class of analyses, which, taking Parliamentary returns as their raw material, save the student who desires to get at the marrow of the subject a very large amount of calculation, will be welcome to many classes of readers. To the intending investor, they furnish almost the only reliable guide. To the statistic they present material in a form ready to his hand. And their value as records will hereafter prove of the highest rank. Mr. Field has done for the gas companies what Mr. Lass has done for the water companies, and Mr. Fleming for the principal railway companies. It is every way to be desired that sufficient public support may be obtained to insure the annual reproduction of these valuable analyses.

It is useless to make extracts from a work of reference which is indispensable to every person who desires to obtain a thorough acquaintance with the subject matter of the analysis. It will be of more interest to take some of Mr. Field's most important results, and carry his work a step further. Thus, for those who wish to ascertain the present state, and movement, of the London gas supply the following comparison will be instructive:—

METROPOLITAN GAS COMPANIES.			
	1882.	1883.	
Capital expended	£13,393,104	...	13,689,984
Gross revenue (including sale of residuals)	3,962,685	...	4,162,274
Working costs (including coal)	2,483,719	...	2,753,615
Net revenue	1,478,966	...	1,408,659
Per cent. on total capital	9.4	...	9.7
Increase of capital		2.14	
" income		3.87	
" working cost		2.37	
" net revenue		5.90	
" profit		3.19	

The above figures are evidently highly satisfactory from the point of view of the gas proprietor. But the question arises, how far is this prosperity attained at the public cost? As to this the sliding scale is now in operation in each of the three great metropolitan gas companies. The results we throw into tabular form:—

METROPOLITAN GAS COMPANIES.			
	1882.	1883.	Public gain.
Additional dividend under sliding scale	1.82	...	1.78
Gas rentals, per 1,000 cubic feet	37.50	...	37.27
Net gas receipts, per 1,000 cubic feet	36.98	...	36.75

It thus appears that the average price of gas has been reduced to the public by about a farthing per thousand cubic feet in the year. Thus the public advantage is much less than that obtained by the shareholders; but the movement is in the right direction. The theory of the sliding scale is to divide increase of profit between producer and consumer. When this sound and admirable rule is once thoroughly established, its working out will become a matter of detail. We are not concerned,—nor, indeed, have we the materials at hand,—now to enter into the question why the public gain for 1883

* Fully reported in our Conference Supplement to the *Builder* for May 10, p. 679.

† An Analysis of the Metropolitan and Suburban Gas Companies' Accounts for the year 1883. Compiled and arranged by John Field. London: E. Fisher & Co. 1884.

has not been larger in proportion than appears to be the case. The form into which we have thrown Mr. Field's figures (which is not, of course, one to be found in his pages) will enable the reader at a glance to comprehend the relative advantages to buyer and seller shown by the movement of the year. The value of a work of this kind is not limited to gas enterprises alone. By the application of a like exhaustive analysis to the accounts of railway companies, canal companies, and water companies, like results may be attained. And we think that the knowledge thus attainable can hardly fail, sooner or later, to secure the great condition demanded alike for public and private welfare,—the creation of a practical partnership, or division, between buyer and seller, of the increment of trade profit. To that we think that the purchaser is entitled; and by that means, we make little doubt, the permanent welfare of the seller will best be promoted.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

A SPECIAL meeting of the members of this Institution took place on Wednesday evening last, to receive and adopt the directors' report and balance-sheet for the year ending 1883. Mr. C. Mead, the president, occupied the chair, and there was a large attendance of members. Mr. Bedford, the secretary, having read the report and balance-sheet, Mr. Stapleton proposed and Mr. Welch seconded their adoption, and after a short discussion, the motion was carried unanimously.

A glance at the report shows that the Institution is now in its forty-second year, and that since its commencement it has paid, for the assistance of members, their widows and orphans, no less a sum than £5,403. 15s. It has now on its pension-list two male and sixteen female pensioners, who have received during the past year £222. 6s. These figures speak for themselves, and show the necessity of young builders, foremen, and clerks of works joining such an institution. Mr. J. W. H. Bedford, the corresponding secretary, will be glad to answer any inquiries as to the objects of the institution, the offices of which are at 9, Conduit-street, Regent-street.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

THE last evening meeting for this session of the above society took place on Monday, the 16th inst., at No. 4, St. Martin's-place, Trafalgar-square.

Mr. J. G. Waller presided, and Mr. F. C. Sachs read a paper written by his brother, Mr. John Sachs (in the unavoidable absence of the latter from indisposition), entitled "Arms and Armour," in which he said that tunics of armour constructed of crocodile skins were used by the ancient Egyptians. The Assyrians also used helmets of bronze and iron, with a camail of chain mail and quilted dresses. The Greek, Roman, and Saxon armour was then taken in order, and described, with the assistance of sketches and engravings, which were handed round the room. These were copied from old manuscripts, brasses, and other sources, as a figure of William the Norman, for instance, taken from the celebrated Bayeux tapestry. While speaking of shields, Mr. Sachs described the shield used in the trophy of Henry V. in Westminster Abbey as constructed of oak; over the front is first a covering of coarse flax, over which are stretched four layers of stout linen; on the uppermost layers are indications of painted colours, which are probably the remains of the cognisance with which the shield was emblazoned. The inside of the shield has been covered with white silk, a portion of which remains; it has a diaper of ivy-leaves worked over the fabric, over which is a seine of fleur-de-lis; over all is worked, on a crimson ground, an escarbuncle. This specimen is one of the earliest examples of needlework this country possesses, and it is a pity it is not better protected.

The chairman (Mr. Waller), at the conclusion of the paper, offered a few remarks on armour generally, chain armour, plate armour, and "banded mail."

Mr. Thomas Milbourn then read some observations on Medieval London at the Health Exhibition, part of which we may be able to give on another occasion.

MR. STOREY'S SCHOOL OF COLOUR.

SIR,—Mr. Storey's project for a school of colour is, in my opinion, an admirable one for the times. It offers the opportunities of a new platform, a new point of departure, which is often of great advantage when teaching has fallen into a set routine founded upon erroneous technical notions. Colour has no existence, as colour, but as an affection of the optic sense, and whether the retina be affected by pigments or by solar rays, it is by vibratory action only. No colour from either pigment or solar ray enters the eye. The true science of the harmony of colour is founded upon the perfectly-constituted sense, upon feeling, and may be followed quite independently of any acquaintance with the physics of light, as it was in the times of the great Venetian colourists. It is upon this basis, if I understand him rightly, that Mr. Storey would establish his school, the students in which would have the same possibilities as in the times of the old masters. Meanwhile, the scientists might be able to frame a more correct theory than any yet put forward for technical instruction.

W. CLAVE THOMAS.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

May 30.—8,401, F. H. White, Liverpool, Fitting Spring Trivets to Fire-grates, &c.—8,415, J. Brierley, Blackburn, Chimney-tops.—8,430, C. Kilmister, Brighton, Diamond Roofing.—8,434, J. D. Garrett, Southwold, Heating Apparatus.

May 31.—8,464, J. C. Kent, Bedford, Water-waste Preventer.—8,468, H. Sutcliffe, Halifax, Lavatory and Water-closet Basins.—8,474, W. Crook, Salisbury, Fire-grates, &c.—8,485, W. Nicol, Buckhaven, Syphon Fusher for Sewerage Drains.—8,488, E. Capitaine, London, Curing Damp Walls, &c. Com. by A. Rottlie, Hanover.

June 2.—8,522, W. Smith, Dublin, Portland cement.

June 4.—8,594, A. M. Clark, London, Controlling the Supply of Water to Wash-basins, &c. Com. by T. P. Ford, Brooklyn, and J. Cruickshank, New York, U.S.A.—8,600, R. McTaggart, Shawlands, Adjustments for Fanlights, &c.—8,604, J. Friend, Exeter, High-pressure Ball-valve Cock.—8,613, G. Sewall and W. H. Sissons, Barton-on-Humber, Manufacture of Bricks and Tiles.—8,629, O. Elphick, London, Drain-traps.—8,631, G. Calvert, Glasgow, Window-sashes.

June 6, 1884.—8,650, J. Donald, Glasgow, Fire-grates.—8,653, W. Reed, London, Automatic Suction Pipe for Ventilating Purposes.—8,675, W. Middleton, London, Slating Iron Roofs.

June 7.—8,683, W. T. Symons, Winstford, Materials for Floors, &c.—8,691, H. C. Webb, Worcester, End-grain Wood Carving, Veneer or Covering for Floors, Ceilings, Walls, &c.—8,695, W. Baker, Brookley, Lavatory Water Supplies and Wastes.

June 9.—8,731, J. Robertson, Glasgow, Portland Cement.—8,737, W. A. Rees, London, Cornice-pole Rings.—8,747, A. McLean, London, Moulding Descriptive Glass Blocks.—8,749, J. A. Adams, London, Door Springs.—8,753, J. T. Pennycook, London, Apparatus for Opening or Closing Fanlights, &c.

June 10.—8,776, J. Mangnall, Manchester, Syphon Stench-traps.—8,778, J. H. Johnson, London, Heating Apparatus. Com. by E. Kötting, Hanover.—8,810, W. R. Lake, London, Dressing or Shaping Stone. Com. by J. W. Mayo, Somerville, U.S.A.

June 11.—8,844, S. H. Rowley, Swadluote, Water-closet Basins.—8,848, H. J. Hadden, London, Joints applicable in the Construction of Buildings, &c. Com. by J. Prokesh and H. Zwanziger, Vienna.—8,856, J. M. Lamb, London, Ventilators.

June 12.—8,885, J. Turner, Hyde, Hanging and Drawing Curtains.—8,871, G. E. Coke, Nottingham, Bath Overflows, Wastes, &c.—8,876, J. A. Thompson, London, Adjusting Looking-glasses.—8,894, T. W. Dawes, Brighton, Valve-closets.—8,899, C. Wenner, Zurich, Switzerland, Ventilation.—8,900, E. L. Sheldon, London, Coated or Covered Metal for Roofing Purposes, &c.—8,904, J. Main, London, Water Waste-preventing and Flushing Apparatus.

SPECIFICATIONS ACCEPTED.†

June 3.—7,148, W. Bartholomew, London, Flushing Tanks, &c.

June 10.—6,993, E. E. Allen, London, Construction of Portable Buildings.

June 13.—6,462, P. J. Neate, Rochester, and H. Ward, Sittingbourne, Sifting Cement, &c.—7,300, J. Hoys, Ashton-under-Lyne, Sanitary Receptacles.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending June 7, 1884.

4,978, F. Wirth, Frankfurt, Curtain-holders. Com. by J. Vaas, Karlsruhe. (Oct. 18, 1883, price 6d.)

* Compiled by Hart & Co., Patent Agents, 166, Fleet-street.

† Open to public inspection for two months from the dates named.

A wall-plate is slotted and chamfered to receive a T-headed bracket arm, which can slide along the slot. The shank of the bracket arm is hollow, to receive the stem of the hook, which is fitted therein telescopically.

5,019, E. Newton, Hitchin, Securing Glass in Greenhouses (Oct. 22, '83, 6d.).

Twin strips of lead are folded into the shape of a T in cross section, the shank being double. The cross piece of the T is secured on the frames, and has gutters formed along the edges, and when the glass is placed thereon the vertical double shank is divided at intervals transversely and also longitudinally, so that the two parts can be bent down over the glass to secure the same.

Published during the week ending June 14, 1884.

5,007, G. Asher, Balsall Heath, Ash-pans. (Oct. 26, '84, 6d.)

A grating is fitted in the top of the ash-pan, to which an oscillating motion can be given when the cinders are sifted and the dust is allowed to fall to the bottom of the pan.

5,099, T. Whittaker, Accrington, Treating Residual Matters from Town Refuse in the Manufacture of Bricks, &c. (Oct. 27, '84, 4d.)

The cinders and other matters found therewith in town refuse are burned, and the residual cinders are ground and pulverised and then mixed with a small proportion of clay, &c., and made into bricks.

5,134, J. Foster, St. Helen's, Clearing Roads, &c., from Snow. (Oct. 30, '83, 6d.)

The snow is raised by automatic shovels and passed into a heating chamber, and by the sides of a double furnace, where it is melted, and the water is passed into a tank whence it can be discharged as required. The whole apparatus is mounted on wheels and can either be drawn by horses or propelled by an engine actuated by steam made by the furnace from the snow, the shovels in both cases being actuated by the revolution of the wheel axles.

MEETINGS.

TUESDAY, JUNE 24.

International Health Exhibition.—Lecture by the Hon. Lewis Wingfield, on "English Dress." 2.30 p.m.

(2) The Rev. W. E. Greeny, on "Hubbings of Foreign Brasses." 8.30 p.m.

Anthropological Institute.—(1) Professor Flower, F.R.S., President, "On the Size of the Teeth as a Character of Race." (2) Mr. O. A. Shrubsole, "On Flint Implements found at Reading." Exhibition of Palaeolithic Implements recently found in the north-east of London, by Mr. J. E. Greenhill.

THURSDAY, JUNE 26.

Society of Antiquaries.—(1) Mr. R. S. Ferguson, "On the Tomb of Margaret, Countess-Dowager of Cumberland." (2) The Rev. W. E. Greeny, on "Hubbings of Foreign Brasses." 8.30 p.m.

International Health Exhibition.—Lecture by Dr. Pratt on "The Ambulance." 5.30 p.m.

Society for the Encouragement of the Fine Arts.—A Morning Meeting.

FRIDAY, JUNE 27.

International Health Exhibition.—Lecture by Mr. R. W. Edis, F.R.S.A., on "Healthy Furniture." 5.30 p.m.

Miscellaneous.

Rebuilding Hatchett's Hotel.—This well-known hostelry in Piccadilly, which has been in progress of rebuilding for several months past, has just been covered in. The Piccadilly frontage is 70 ft. in length, and upwards of 80 ft. in height, containing seven stories above the ground-floor, the elevation terminating with two gables, carried up to the level of a high-pitched roof. The frontage, up to the foot of the second floor, is faced with Portland stone, containing much rich carving in the spacious projecting oriel windows and other parts of the frontage. The upper portion of the frontage is faced with red brick and Portland stone windows and dressings, the windows of the differnt floors being mullioned. The building has also a return frontage in Dover-street, but not so lofty. The entrance to the hotel is in Dover-street, under an archway, 6 ft. in width, flanked on either side by double pilasters. The entrance leads into a vestibule or entrance-hall, about 16 ft. square. From the entrance-hall the upper portions of the hotel are reached by a grand staircase, the steps of which are formed of marble. Mr. W. S. Weatherley and Mr. F. E. Jones are the joint architects of the hotel, and Messrs. Higgs & Hill are the builders, their contract amounting to 22,000l.

CAPE TOWN INDUSTRIAL EXHIBITION.

This Exhibition is to be opened on September 9th, and is to remain open during the month. It is especially intended to show the resources of South Africa and to indicate the direction in which they may be further developed, and does not appeal to exhibitors from other continents. Among the names of those who support the project are Sir Hercules Robinson, Governor of Cape Colony; Sir Henry Bulwer, Governor of the Colony of Natal; Sir John Brand, President of the Orange Free State; and Mr. Kruger, the President of the South African Republic.

New Buildings in Wood-street.—One of

the finest and most costly blocks of buildings which have risen upon the ashes of the great fire in Wood-street, is that now nearly completed for Messrs. Silber & Fleming. The Wood-street frontage of the buildings extends in continuation of Messrs. Rylands' premises (a view of which appeared in the *Builder* of the 10th ult.) to London-wall, a length of 70 ft. The ground floor of the frontage contains eight shops. These are divided by red polished granite piers on grey polished granite bases. The upper floors of the frontage,—four in number,—are in Portland stone, the entire face of the elevation being rich with carving. Fluted plaster divide the three-light mullion windows, the capitals of the pilasters between the second floor windows consisting of sculptured heads representative of European and Asiatic nationalities. Between the third and fourth floor windows there are carved and moulded columns entwined with foliage, and a range of elaborately-carved vases surmounts the main cornice. At the corner of Wood-street and London-wall there is a bold angular frontage, which contains the main entrance to the premises, and beyond this there is likewise a return elevation in London-wall, containing two shops, this frontage being in every respect uniform with the Wood-street elevation, including the sculptured heads already noticed. The building is upwards of 65 ft. in height. Messrs. Ford & Hesketh, of Aldermanbury, are the architects; and Mr. W. Brass, of Old-street, is the contractor. Amongst the several buildings which suffered by the Wood-street fire was the ancient tavern in Philip-lane, opposite to Messrs. Foster, Porter, & Co's premises, and known as the "Old York-shire" tavern. The premises, which were almost destroyed by the fire, have just been replaced by the erection of an entirely new building. The building is faced with red pressed and gauged brick, with alternate bands in Mansfield stone. The ground-floor has elliptical-arched windows, with piers between them in Mansfield stone, the piers being faced with carved festoons of fruit and flowers. The central portion of the frontage contains two stories above the ground-floor, whilst the north and south sides of the elevation are carried to the height of an additional floor, terminating with ornamental gables. Mr. J. T. Smith is the architect, and Mr. W. Brass the contractor. The cost of the building will be between 7,000l. and 8,000l.

A Stone-Moulding Machine.—Messrs. Western & Co. have recently patented a machine for quickening and cheapening the process of working stone mouldings. The stone is fixed on a traversing table and passes the ends of a series of steel roughing tools, adjusted to the rough outline of the moulding to be worked. There are several rows of roughing tools, which can be arranged for any outline required. The cutting-edges of each row project a little over those of the previous one, so that practically each time the stone is traversed several cuts are made, the result being great expedition in roughing the stone down to the approximate shape of the moulding required. These roughing-down tools are plain bars of steel, with suitable packing-pieces in between them to keep them level, and only one set of these tools is required for any section of moulding. As soon as the stone is roughened down to the approximate shape of the moulding required, it is scraped to its exact outline by a scraping tool of the exact form of the finished moulding. By carefully adjusting the roughing tools there will be very little work left for the scraper to do. The table which carries the stone can either be moved horizontally or placed at an angle; and driving-gear is provided with two sets of pulleys, one for moving the table forward while cutting, and the other for running it back at a higher speed while not cutting. The power required is not great, a six or eight horse-power engine being sufficient for the work, which leaves no hand labour to be done on the stone.

The Sunday Society and the Health

Exhibition.—As we mentioned at the time, the Sunday Society recently presented a petition to the Council of the Health Exhibition, in which they asked for the opening of the Exhibition on one Sunday in each month. The memorial has been considered by the Council, and Mr. Edward Cunliffe Owen, the secretary, has written to say that, having given the petition their most careful consideration, they are unable to comply with its terms.

Prince's Mansions, Westminster.—With the erection of these buildings, which are now approaching completion, the vacant land in Victoria-street will, with the exception of about two sites, be fully occupied by buildings, many of them consisting of structures containing residences in flats for the aristocratic and affluent classes. Prince's Mansions, on the north side of the street, not far from the Victoria Station, are buildings of this class. They consist of three blocks, having a frontage to Victoria-street 311 ft. in length, and extending to a depth of 70 ft., the rear of the buildings overlooking the District Railway, which at this point proceeds through an open cutting. They thus cover a ground area of about 22,000 superficial feet. The buildings are exceptionally lofty, being nearly 90 ft. in height. They contain eight floors, the elevation being faced with red brick and Lascelles's patent concrete, which is very freely introduced throughout the frontage, from the ground-line to the surmounting dormers. At the angles of the several blocks bay windows are continued from the ground-line to the top of the building. Each block has separate entrances, consisting of double-arched projecting porches in elaborately moulded stone, this feature in the frontage being maintained up to the foot of the second floor windows, at which there is a balcony. Each floor in the three blocks has a range of thirty windows, those of the first, second, and third floors being arched, with prominent overhanging window-heads. Above the cornice the elevation is surmounted by pediment dormers, all faced with patent stone. All the floors of the buildings, from the basement to the top story, are intended to be fire-proof, and are formed of iron girders and cement; and a further special feature in the buildings is that all the floors are what is designated as sound-proof. Each block is fitted with separate passenger and luggage lifts from the basement up to the several floors. Mr. Bassett Keeling, of Tokenhouse Buildings, is the architect, and Messrs. Perry & Co., of the Tredegar Works, Bow, are the contractors.

New Industrial Dwellings in Waterloo-road.—An extensive pile of new dwellings for the working classes, occupying an area of upwards of three-quarters of an acre, is now in course of erection in Waterloo-road, the owners and builders being Messrs. Quinn & Son, who have already erected similar buildings in Bethnal Green. The buildings, which consist of eight blocks, are quadrangular in form, seven of the blocks forming the quadrangle, with another block in the centre. Each block contains six floors, the dwellings on the different floors containing one, two, and three rooms, thus affording accommodation for single men as well as for families. The buildings are calculated to house a population of 850 persons. They are substantially erected in stock and red brick, with Portland cement windows, cornices, and dressings, cement also being used in the setting of the brickwork in place of ordinary mortar. A flat roof at the top of each block serves as a drying-area as well as for recreation space for children. All the dwellings are fitted with cupboards, and each has separate sinks and coppers, with dust-shoots and water-closets on each floor. The dwellings are ventilated throughout from front to back, and each floor has separate ventilators at the different landings. There are likewise special ventilators in all the bed-rooms, and all the soil-pipes are ventilated. The buildings are surrounded by four streets, with access from each, the principal approaches being from Waterloo-road, on the east side, and Duke-street on the west. Messrs. Borer & Dobbs, of London-wall, are the architects. Mr. Samuel Greenstall is foreman of the works. The situation of the buildings renders them very convenient as residences for artisans employed in the locality, and we understand that although the premises are not yet ready for occupation there are already numerous applications for tenancies.

Maps of London Districts.—Mr. Stanford's "London Government Maps," five plans in one portfolio, come very opportunely at the present moment, and ought to be very useful to those who wish to understand clearly the practical effects of proposed changes in the Government of London. The five maps distinguish respectively, by strong coloured borders, the division of districts for Municipal Government, Water Companies, Gas Companies, Parliamentary Boroughs, and Poor Law Unions.

The Royal Meteorological Society.—The concluding monthly meeting of this Society for the present session was held on Wednesday evening last, at the Institution of Civil Engineers, Mr. R. H. Scott, F.R.S., president, in the chair. The first paper read was on "The Equinoctial Gales. Do they occur in the British Isles?" by Mr. R. H. Scott, F.R.S. The period investigated was the fourteen years, 1870-84, and only those storms were selected which had attained force 9 of the Beaufort scale at more than two stations. The results show that the storms are all but exclusively confined to the winter half-year, and also how, for a certain interval, the stream of storm depressions set over the British Isles, and then for a time takes another path, leaving this country at rest. In some years there are as many as four or five storms in a fortnight, and in others there are none or only one. It is further shown that there is no strongly-marked maximum at either equinox. The second paper was "On the Physical Significance of Concave and Convex Barographic or Thermographic Traces," by the Hon. R. Abercromby. The third paper was on "Maritime Losses and Casualties for 1883 considered in connexion with the Weather," by Mr. C. Harding, F.R. Met. Soc. The fourth paper was on "The Helm Wind," by the Rev. J. Brunsell. The fifth and concluding paper was on "The Climate of the Delta of Egypt in 1798 to 1802, during the French and British Campaigns," by Surgeon-Major W. T. Black. On the previous evening a large number of the Fellows dined together at the Holborn Restaurant, to commemorate the favour recently granted by her Majesty the Queen of according to the Society permission to adopt the prefix "Royal." Mr. R. H. Scott, F.R.S., the president, occupied the chair.

Ensilage.—We are informed that H.R.H. the Duke of Edinburgh intends converting into silos two ice-houses on the Eastwell Park Estate, Ashford, Kent. The compression will be effected mechanically by means of the patent chain appliances introduced and patented by F. W. Reynolds & Co., engineers, of Acorn Works, Edward-street, Blackfriars-road, London, S.E., and now to be seen in the Machinery in Motion Department of the International Health Exhibition, near the north door. The system of effecting compression by mechanical means was one of the chief features at the recent meeting of the Bath and West of England Society at Maidstone, six silos having been constructed in the trial fields of the show-yard by Mr. H. A. Brassey, M.P. These were filled during the show, and Messrs. F. W. Reynolds & Co. mechanically compressed one by means of the patent chain appliances before alluded to, and three by means of Potter's patent hydraulic pressure appliances also introduced by the same firm, and described by us some months ago. The results of the trials in each case are reported to have been satisfactory.

The Art of Carriage-Axle Manufacture.—This was the subject of an interesting paper read on Tuesday evening last by Mr. W. T. Shorthouse, before the members of the Institute of British Carriage Manufacturers. As to material, the lecturer said that what is wanted for axles is a high-class quality of iron, that shall partake of the strength and rigidity of steel, combined with the toughness of the softest iron; in a word, iron that shall neither bend nor break. Iron that has not been worked up to too high a state, and also iron that is clear; the softer kinds, as a rule, being more likely to have black specks in the arm when turned and hardened. To produce the right kind of iron, and to keep it of uniform quality, requires very careful watching in its manufacture, and it is only to be obtained at an increased cost. The latter part of Mr. Shorthouse's paper consisted of an account of the steps taken by the Institute of British Carriage Manufacturers and by the Committee on Standard Sizes with a view to recommend certain sizes and proportions for axles and parts of wheels.

The "Lancaster Park" Hotel, Hydropathic, and High Harrogate, Land Company, Limited.—The prospectus of this company appears in our advertising columns. The object of the company is to purchase the freehold estate called "Lancaster Park," High Harrogate, embracing an area of 19 acres, 1 rood, 38 perches, or 94,319 square yards, and on the portion thereof fronting the "Stray" to build an hotel, combined with an hydropathic establishment, and subsequently to erect houses on the remaining land, or to sell plots for that purpose.

Vaccination and Small-pox.—In view of the recrudescence of small-pox in the metropolis, the National Health Society have forwarded to several Metropolitan Boards of Guardians and sanitary authorities copies of a pamphlet which they have prepared on the subject of vaccination, and which they suggest should be left by the local officials, or by special temporary officers to be appointed, at each house within the several districts. This plan has already been carried out with marked success in certain metropolitan unions, and the general adoption of a similar course would, no doubt, lead to equally beneficial results. The pamphlet in question has received the honour of revision and amplification by the Local Government Board, who have, moreover, sanctioned in a number of cases the repayment of the expenses of its distribution out of the Metropolitan Common Poor Fund. The pamphlet may now, therefore, be fairly regarded as an official publication on the subject of which it treats. The Society suggests that it would tend greatly to encourage vaccination and re-vaccination if the plain facts on the subject were brought home to every householder by a copy of the pamphlet being left at his door; and it would, moreover, materially assist the vaccination officers in the discharge of their often difficult duties. With the praiseworthy object of assisting as far as possible in the limitation of the epidemic, the Society offers to supply copies of the pamphlet, as revised by the Local Government Board, at the cost of printing.

Building on the Sion College Estate.—The last remains of the buildings of Sion College will shortly be swept away. The only buildings connected with the College now left are the library and the hall, and these are intended to be taken down, when the site will be covered with warehouses and other buildings of a mercantile character, pending the erection of the new college buildings on the Thames Embankment, arrangements for which are in progress. Meanwhile an extensive block of warehouses is about to be erected on that part of the College grounds in London Wall situated between the library and the west boundary of St. Alphege's Church, to which they will extend. The excavations preparatory to getting in the foundations of the buildings are now being made. Messrs. Lawrence & Sons, of City-road, are the contractors.

A Refuse Destructor.—We have received from Messrs. Birtwistle & Co., of Burnley, a description and sketch of an oven, as it may be termed, for destroying all kinds of refuse, constructed by them under the supervision of the Borough Surveyor of Burnley, Mr. J. E. Stafford. It consists of a domed receptacle 7 ft. diameter, built of fire bricks, on a concrete base, with a furnace below and a feed-hole above for putting into the chamber whatever is to be destroyed. A flue carries off the gases, and the ashes of the refuse fall through into the fire and become incorporated with it. The makers state that one of these receptacles is equal to the destruction of the refuse of a town of 60,000 inhabitants, and that it consumes one load, or 15 cwt., of refuse in an hour, at a cost of 1s. for fuel and attendant's time. The destructor is at work at Burnley.

Repairs at St. James's Church, Piccadilly.—This church is at present undergoing extensive repairs both externally and internally. All the outside walls have been re-pointed, and new material inserted where necessary. The roof has been to a great extent renewed, and entirely re-slatted. The tower and spire are likewise undergoing reparation, scaffolding for the purpose having, within the last few days, been erected entirely around it, from the base of the tower to the apex of the vane. The interior of the church is to be cleaned and re-decorated. The works are being carried out under the superintendence of Mr. Wimperis, architect, Mr. Lea, of Warwick-street, Regent-street, being the contractor. The cost of the works will be about 1,500l.

Diminution of Commercial Failures.—The number of failures in England and Wales gazetted during the week ending Saturday, June 14th, was 43. The number in the corresponding week of last year was 234, showing a decrease of 191, being a net decrease in 1884, to date, of 3,302. *Kemp's Mercantile Gazette*, from which these figures are quoted, further states that the number of failures in the building trades for the week ending the 14th inst. was 5, as compared with 26 and 28 in the corresponding weeks of 1883 and 1882 respectively.

The Burlington House Colonnade.—The splendid colonnade, or peristyle, of old Burlington House, has now been lying prostrate by the river side in Battersea Park ever since 1867. I never visit these ruins without a feeling of shame and astonishment that a city so sensitive to the exact position of the Wellington statue, and so eager to re-erect at enormous cost an arch of quite inconsiderable beauty, should leave these historic stones to cold neglect and mouldering decay. The elaborate details, crowns, and monograms are fast getting blurred, "made weak by time and fate." Let me, therefore, plead for their speedy re-erection as an entrance to Battersea Park out of the broad boulevard that lines the Thames between Chelsea and Battersea Bridges. The site is unique, and the architectural effect would be one of the finest on the banks of the Thames.—*Truth.*

Masonry Gasholder Tanks.—On this subject a valuable practical paper was read the other day by Mr. F. Browning, before the Institute of Civil Engineers of Ireland, in reference to the new masonry tanks of the Alliance and Dublin Consumers' Gas Company, summing up in favour of masonry tanks as compared with cast iron, wrought iron, brick, or concrete. Those who may be practically interested in the subject will find useful rules in Mr. Browning's paper, which will, we presume, be published in the Transactions of the Society before whom it was read.

Steam Tramways for the Metropolis.—An order for fifteen steep gradient tramway locomotives has just been placed with Messrs. Merryweather & Sons, of Greenwich, for use on the North London Tramways.

TENDERS.

For erection of a school at Eltringham-road, Chelsea, for the School Board for London. Mr. E. R. Robson, architect.

Priestley & Gurney	£16,985 0 0
W. Goodman	16,777 0 0
C. W. Reading	16,074 0 0
Lathbury Bros.	16,024 0 0
W. Shepherd	16,007 0 0
Tarble & Appleton	15,995 0 0
W. Shurmer	15,894 0 0
W. Hanks & Co.	15,817 0 0
Perry & Co.	15,650 0 0
Kirk & Randall	15,477 0 0
W. Oldrey	15,280 0 0
Stimpson & Co.	15,270 0 0
W. Tongue	15,100 0 0
Wall Bros.	15,092 0 0
J. D. Hobson	15,027 0 0
J. Grover	15,000 0 0
J. Holloway	14,988 0 0
R. J. Jerrard	14,873 0 0
W. Downs	14,733 0 0
C. Wall	14,726 0 0
H. Hart	14,670 0 0

For diving-hall at the Workhouse, Sidney-road, Homerton, for the Guardians of Hackney Union. Messrs. Lee & Smith, architects. Quantities by Mr. W. Barnett.—

G. Shaw	£9,958 0 0
T. Boyce	9,870 0 0
H. Hart	9,830 0 0
Stevens & Bastow	9,699 0 0
J. Shapman	9,600 0 0
Goodard	9,500 0 0
McGregor	9,400 0 0
B. E. Nightingale	9,281 0 0
Bull & Co.	9,177 0 0
J. Holland	9,099 0 0
R. Mart	9,098 0 0
J. Harper	9,080 0 0
Priestley & Gurney	9,070 0 0
J. Allard	9,000 0 0
W. Shurmer (accepted)	8,946 0 0

For the erection of new school and class-rooms, construction of organ-chamber, painting, decorating, &c., at the Union Chapel, High Wycombe. Mr. Arthur Vernon, architect.—

Taylor & Grist	£11,319 0 0
Seill	1,837 0 0
Woodbridge	1,247 0 0
Idenden	1,221 0 0
Cooper	1,187 0 0
Wood	1,173 0 0
Harris	1,130 0 0
Nash	1,056 0 0
Hill	1,053 0 0
Gibson (accepted)	1,045 0 0

For house and shop at Sandgate, for Mr. A. Stace. Mr. J. A. Saunders, architect, Folkestone. No quantities.—

Fearnley, Folkestone	£234 0 0
Holdom, Folkestone	223 0 0
Jeal, Sandgate	860 0 0
Hayward & Paramor*, Folkestone	833 0 0

* Accepted.

For the erection of a villa residence at New Malden. Mr. H. Marsh, architect.—

Johnson	£3,291 0 0
W. Shurmer	2,661 0 0
Lee & Co.	2,590 0 0
Nye	2,144 0 0
Lane	1,858 10 0
Alldridge & Co.	1,823 10 0

For the erection of a block of school buildings and appurtenances on a site at Forest-gate, Essex, for the West Ham School Board. Mr. J. T. Newman, 2, Fenchurch, E.C., architect. Quantities supplied by Messrs. Curtis & Sons.—

C. Cox	£11,267 0 0
T. E. Nightingale	11,261 0 0
Wall Bros.	11,010 0 0
A. Reed	10,864 0 0
Hearle & Son	10,556 0 0
S. H. Hockings	10,393 0 0
J. Catley	1,746 0 0
T. Boyce	16,580 0 0
Knight & Dustow	10,564 0 0
F. & P. J. Wood	10,474 0 0
J. Morter	10,299 0 0
W. Gregar	10,170 0 0

For the erection of new premises, No. 64, Basinghall-street, E.C. Mr. Richard M. Rose, architect, 57, Basinghall-street. Quantities supplied by Messrs. Batstone Bros.—

Mowlem & Co.	£3,051 0 0
T. L. Green	3,085 0 0
Colls & Sons	3,643 0 0
R. Conder	3,620 0 0
Asby & Horner	3,583 0 0
Lawrence & Sons	3,523 0 0
J. Grover	3,484 0 0
Larke & Sons (accepted)	3,370 0 0

For gardener's cottage, at Buller's Wood, Chislehurst, for Mr. J. Sanderson. Mr. E. Newton, architect.—

J. C. Arnsd & Son (accepted)	£325 0 0
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[No competition.]

For the erection of Mechanics' Institute, Southend. Mr. E. Wright, architect. Quantities by Mr. Henry Lovegrove, 26, Budget-row.—

Bullock	£1,800 0 0
Drake	1,407 0 0
Baker & Wiseman	1,419 0 0
Steward	1,368 0 0
E. Woodham	1,360 0 0
Whur (accepted)	1,260 0 0

[Design without basement.]

Darke & Son	£1,500 0 0
Baker & Wiseman	984 0 0
Whar (accepted)	949 0 0
Woodham	940 0 0
Steward	631 0 0

[Architect's estimate, £387.]

For alterations to the Bull's Head, Chandos-street. Mr. J. England, architect.—

W. Shurmer	£255 0 0
J. Beale (accepted)	785 0 0

For road and sewer, Egerton-road, Stamford hill. Mr. J. Hamilton, surveyor, 204, Bishopsgate-street, Within.—

Bloomfield	£315 0 0
Jackson	570 0 0
Bell	559 0 0
Fotter (accepted)	474 0 0

For villa residence at Uplands Park, West Enfield. Mr. J. Hamilton, architect.—

W. Wallcut	£1,500 0 0
Morris & Wardrop	1,194 0 0
H. Harper	1,088 0 0
Harvey	1,084 0 0
Sayer	985 0 0

For residence at Crouch End, for Mr. Love. Mr. J. Hamilton, architect.—

T. Boyce	£1,693 0 0
S. H. Hockings	1,678 0 0
B. J. Scott	1,672 0 0
Calow	1,622 0 0
H. Harper	1,455 0 0
Harris & Wardrop	1,478 0 0
W. Shurmer	1,438 0 0
Harris	1,395 0 0
Woolveridge	1,384 0 0

For fitting ten shops at the Central Fish Market, for the Corporation of the City of London. Mr. Horace Jones, architect.—

Egan	£2,078 0 0
J. Brian	1,837 10 0
Burrough	1,229 0 0
Good	1,188 0 0
Arnold	1,154 0 0
Jeffries	1,148 0 0
Mowlem	1,100 0 0
Mark	1,070 0 0
Mower	1,050 0 0
Building Co. (Hobgen)	1,042 0 0
Scharien & Williams	998 0 0
W. Shurmer	990 0 0
Webb & Rolfe	945 0 0
Hunt	933 0 0
M. Gentry	905 0 0
T. L. Green	779 0 0

For the erection of new Church of St. Michael and All Angels, Stoke Newington-common. Mr. J. E. K. Catts, architect.—

Lawrence & Sons	£5,890 0 0
J. Morter	5,853 0 0
J. Tverman	5,828 0 0
J. Hicks	5,811 0 0
Lathbury Bros.	5,619 0 0
Dove Bros.	5,475 0 0
Macey & Sons	5,336 0 0
Holliday & Greenwood (accepted)	5,242 0 0

For the restoration of the chancel of St. Mary's Church, Temple Guiting. Mr. J. E. K. Catts, architect.—

J. Barnes & Sons	£305 0 0
T. Collins	295 0 0
G. Hookham & Son (accepted)	242 10 0

Accepted for the erection of a new farm house at Grove, Goring, for Mr. Charles Gardiner. Mr. W. Ravenscroft, 6, Market-place, Reading, architect. Quantities by Messrs. Cooper & Sons, Reading and Maidenhead.—

T. Higgs, Goring	£1,195 0 0
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For entrance-gates, store delivery-rooms, waiting-rooms, road-making, &c., at the South Western Hospitals, London-road, Stockwell, for the Metropolitan Asylums Board.

Mr. Mat. New Wyatt, architect	£2,150 0 0
R. Mayo	1,991 0 0
J. W. Sawyer	1,965 0 0
Mowlem & Co.	1,965 0 0
Schofield & Co.	1,965 0 0
Wall Bros.	1,791 0 0
Alldridge & Jenvey	1,745 10 0
W. H. Lorden & Son	1,645 0 0
W. Hammond*	1,585 0 0
Keut Bros.	1,261 0 0

* Accepted.

For the construction of 4 ft. by 2 ft. 8 in. brick sewer, Berkeley-street, for the Vestry of Clerkenwell. Mr. William Iron, surveyor.—

John Mowlem & Co.	£580 0 0
A. Walker	549 0 0
Thomas Adams	539 0 0
W. Neave & Son	479 0 0
Wilkinson Bros.	477 0 0
James Pizey	465 0 0

For finishing Nos. 17 and 19, Tournay-road, for the Middlesex Land Company. Mr. George Edwards, architect.—

Scharien & Williams	£257 0 0
Green	244 0 0
Long (accepted)	230 0 0

For building house and shop, Idgeware-road, Kilburn, for Mr. K. Beall. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove.—

Reading	£2,725 0 0
Woodward	2,616 0 0
Hunt	2,600 0 0
Sanders	2,580 0 0
Nightingale	2,569 0 0
Scrivener & Co.	2,512 0 0
Stimpson & Co.	2,410 0 0
Martin, Wells & Co.	2,388 0 0
Patman & Fotheringham	2,373 0 0
Green	2,335 0 0
Scharien & Williams (accepted)	2,263 0 0

For making-up Station, Palmerston, and Gurney roads, in the parish of Carshalton, Surrey, for the Local Board. Mr. T. Lockwood Heward, surveyor to the Board.—

Station-road.	
Etheridge, Croydon	£140 0 0
Streeter, Croydon	125 0 0

Palmerston-road.	
Etheridge	112 9 8
Streeter	96 0 0

Gurney-road.	
Etheridge	88 0 0
Streeter	85 0 0

Accepted for the extension of the Prince of Wales' leather-house, Homerton, for Mr. W. Pittam. Mr. Richard Peters, architect, Wool Exchange, Coleman-street.—

Watson	£169 0 0
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Accepted for extra story and hot-water service at Salubram, for Mr. Hart. Mr. Richard Peters, architect.—

Watson	£124 0 0
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Accepted for manager's new house, for the Stockbridge Industrial Co-operative Society. Messrs. Dixon & Moxon, architects, Barnsley. Quantities by architects.—

Mason and Brickwork, and Slater's Work.	
Keaworthy & Brearley, Stockbridge.	
Carpenter, Joiner, and Plumber's Work.	
M. H. Hawley, Stockbridge.	

Plasterer's Work.	
James Hall.	

(Total £523 10s. 0d.)

For additions and alterations to premises, No. 9, Wine Office Court, Fleet-street, for the Committee of the Shoe Black Society, Great Saffron-hill, Farringdon-street. Mr. W. Howard Seth-Smith, architect, 46, Lincoln's Inn Fields.—

C. Bowden & Co., 79, Elizabeth-street	£1,297 0 0
W. & E. Curtis, 42, Curzon-street	885 0 0
W. Marriage, 2, Pancras-lane	812 0 0
E. Good, Walthamstow	661 19 0

For the erection and completion of proposed "Philomonia House," Overhill-road, Dulwich. Mr. Edwin C. Somerville, Champion-hill, architect.—

Fyle & Co.	£1,630 0 0
Lorden & Son	1,589 0 0
J. & S. Boyser	1,685 0 0
Balsam Bros.	1,430 0 0
Staines & Son	1,374 0 0
Loe & Co.	1,099 0 0
Cousins (accepted)	1,075 0 0

For Liverpool Zoological Gardens, Contract No. 7. Dog-kennels. Messrs. W. Sugden & Son, architects, Leek.—

(a) Structural Works.	
The Everton Quarry Co., Liverpool	£295 0 0

(b) Concreting.	
Hutchison & Co., Clayton, Manchester	99 19 6

(c) Ironwork.	
Worrall & Co., Liverpool	125 11 10

[The above were accepted subject to certain omissions and reductions.]

For the erection of five houses in Cumberland-place, Addington-square, Camberwell, for Mr. J. Clark. Mr. J. Down, architect.—

Hill Bros.	£2,150 0 0
F. Higgs	2,000 0 0
J. W. Faulmer	1,430 0 0
J. H. Tarrant & Son	1,700 0 0
Marsland	1,425 0 0

The preliminary expenses for establishing the company will be confined to actual payments, such as printing, advertising, brokerage, legal expenses, postage, and office expenses.

INTERNATIONAL HEALTH EXHIBITION

Supplements to The Builder.

No. 6. JUNE 21, 1884.

HANDICRAFT TEACHING, MODELS, APPARATUS, &c., WITH RESULTS OF INDUSTRIAL WORK DONE IN TECHNICAL SCHOOLS.



ONE of the most important sections of the Education Division in the Health Exhibition is that comprised in the new building of the Central Institute of London, having relation to educational work and appliances, &c. Although the exhibits to some extent bearing on primary, secondary, and art and science schools have been on view in the Albert Hall, with some more in the Belgian Court, yet the display intended in the City and Guilds of London Institute is not open to the public as we write, though great haste was being made to have everything in position before the close of the present week. In the new building, as well as in the Albert Hall and elsewhere, there is a large collection of apparatus and fittings, with examples of work executed by boys and youths, shown in relation to elementary schools; yet the particular portions that come within our province at present are those exhibits in connexion with technical and apprenticeship schools. *En passant*, we may also state that a special feature in this new building will be the French educational exhibits bearing upon the primary schools of France, and the industrial teaching imparted therein. Some of the British exhibits in connexion with technical and apprenticeship schools are arranged in a room near the top of the building, the walls of the corridor leading thereto being hung with a large number of drawings in relation to building and coach-building construction. The heavier class of exhibits of Group VI. are in the basement story, comprising lathes, workshop-benches, carpenters', cabinetmakers', carvers', and woodworkers' tools generally. Before commencing to describe the principal exhibits on view, we may further remark that none of the stands were numbered on the occasion of our visit, and the goods also of some intending exhibitors were not on view. Assuming, however, that the numbering in the catalogue will be adhered to, we adopt it. Mr. John Channon, Newland-street, Finsbury, S.W. (Stand 1,512), who is instructor in brickwork in Finsbury Technical College, exhibits a brickwork final of Renaissance design, which may be pronounced excellent in point of execution. The jointing is very fine, and the surface of the bricks as even as possible. This brick final in style had its counterpart in much of the work executed in the Queen Anne and Early Georgian periods. Two drawings accompany this exhibit, giving full workshop details for its execution, plan of consoles, with illustration showing the bond and true shape of bricks as cut in first instance. The workshop details, or "setting-out," as workmen are wont to designate the development of the lines, are worthy of every commendation, and will certainly afford apprentices or young workmen a clear and good technical lesson in ornamental brickwork. The number of exhibits shown in this top room, as executed by the students of the Technical School, University College, Nottingham, are admirable as a whole, and impart sound and practical teaching in relation to the carpentry, joinery, and other kindred branches they relate to. Here is a model of a queenpost roof for engine-house, so framed that the tie-beam can be utilised for raising heavy weights, by the insertion of ringed bolts, the said tie-beam or girder being well tied up to the frame-work above. The other exhibits include a

model of newel staircase, well constructed, a number of small models or portions of staircase and handrail work, cylinders, and wreaths, constructed on true geometrical principles. The panel and handrail exhibit (in part) the blocked well-hole, showing the method for gluing up the pieces that form the cylinder that makes the circuit of the well-hole, and the small scroll in mahogany, with portion of straight rail; all are well handled. A number of drawings accompany the above exhibits, clearly illustrating handrail construction for various forms of stairs, from the first lesson in the tangent method of describing handrail ramps and wreaths, &c. Mr. L. J. Franks, Hutchinson-street, Aldgate, E.C. (Stand 1,513), displays various articles of fretwork, comprising alphabets, memorials, writing utensils cut from wood, and also designs and tools for making the same. The articles on the stand were partly concealed by a covering during our visit, and we were unable to see but a few of them. That portion which we were able to examine of the fretwork articles appeared to be very well executed. The Sheffield School Board Central Schools (Stand 1,514) display a large number of pieces of carpentry and joinery, models illustrating the principles of construction, &c. These are called "workshop exercises," and excellent exercises they are for youths intended for the building trades, to which they relate. Here we have articles or portions of joinery and framing illustrating mortising, tenoning, scarfing, halving, mitring, dovetailing, and other forms of uniting timber in framing. A good plain model of queen-post roof is also shown, evidencing cleanly handled and accurate work. There are accompanying drawings coloured, or in imitation of the grain of the wood, displaying the different forms of joints in carpentry, and also in relation to iron construction. The whole of the exhibits of this school are very creditable, and are calculated to effect much good in the practical instruction of boys in the crafts to which they belong. The Oldham School of Science and Art (J. P. Phythian and J. Robertson, Stand 1,510) display a collection of coloured chalk drawings on black board, in detail of machine construction. There are also models of roofs and good illustrations of descriptive geometry, showing, by a series of stretched strings strained from a level plane to a vertical, the relation between the traces of lines lying in it, intersection of a line and plane normal to a plane, and the horizontal line to a plane. Again, we have, by the medium of these stretched cords or strings (in elevation), two intersecting lines enveloping a sphere and their tangent plane. These illustrations are truly practical lessons in geometry, valuable to young artisans in building construction, for they could understand more in a few minutes from their examination than they would probably in hours of studying drawings on a flat surface in relation to the same problems. The Allan Glen's Institution, Glasgow (Stand 1,515), have on view a very fine and varied assortment of models of machines, and parts of machines, with examples of mechanical drawing and machine design. There is also a drawing, in isometrical projection, of the chemical laboratory in the Institution. This is one of the educational establishments in Scotland visited by the Royal Commission on Technical Education, and favourably reported upon in their report, which is being noticed in these pages. The models and drawings have all been executed by the boys in the Institution. These models and parts of machines in wood are coloured or painted to represent the appearance of the metal. The exhibits are very numerous in connexion with steam machinery, couplings, shaftings, safety-

valves, &c., and, as a whole, they reflect great credit on the Institution, for they afford undeniable evidence of the value of the technical teaching and preparatory handicraft instruction imparted to the boys. Mr. James Rigg, 11, Queen-Victoria-street, E.C. (Stand 1,516), occupies a large space, but with advantage to the practical-minded visitor, by exhibits in relation (I.) to practical plans and solid geometry; (II.) machine construction; (III.) building construction (illustrating roof principles, &c.); (VI.) theoretical mechanics; (VII.) applied mechanics; (XXII.) steam, the latter including sectional working models of various machines and steam-engines for class instruction. This is a very valuable display, and well worthy of the visit of the young building artisan and mechanical engineer. A detailed description of even a tithe of the exhibits shown by Mr. Rigg would necessitate more space than we can afford. The exhibits, in regard to materials and workmanship, even apart from the sound constructive lessons their study will afford, merit every commendation. The National Industrial Home for Crippled Boys, Wright's-lane, Kensington (Stand 1,517), presents, among other exhibits, a number of examples in carpentry, joinery, and fancy cabinet work, executed by the boys in the Institute. Apart from the above workmanship there are specimens of heraldic stamping, and copper-plate printing, tailoring, harness-work and saddlery. The finished examples in relation to joinery work, including desks, work-boxes, and kindred articles, are very fairly finished by the poor youths of this deserving institution. The School of Art-Wood Carving, Royal Albert Hall (Miss Rowe, manager, Stand 1,519), has on view a number of specimens of carving, moulding, panels, brackets, &c. The case in which these exhibits were enclosed on the occasion of our visit was partly veiled within by coverings of paper, so we could only see a few of the exhibits, which appeared to be of good design and cleanly handled. This wood-carving school is in connexion with the City and Guilds of London Institute.

In the corridor, stretching from the head of the staircase to the room in which the above exhibits are displayed, there are arranged upon the walls on each side the coach-building and house-building drawings mentioned in the beginning of our notice. The Institute of British Carriage Manufacturers, G. N. Hooper, president, 16A, Great Queen-street (Space 1,506), display firstly drawings to scale of carriages and parts of carriages; secondly, models to illustrate the various joints, bevells, and fastenings in framing carriages. The drawings to scale are well executed. Among the carriage building exhibits are some executed by mere youths, and others by adults engaged in one department or another of the coach and carriage-making trade. Of models proper, or those executed in wood or iron, we did not observe any, save two small pieces of work. In coach and carriage building there are, it may be observed, both carpentry and joinery, as well as iron construction, and technical knowledge in designing and framing is very necessary. There are curves, too, which are amenable to the rules of practical geometry, though the education of the eye and bold freehand drawing can accomplish much. The Coachmakers' Company or Guild display a very fine collection of competition drawings, which gained first, second, and third prizes during the last two years. These drawings are full-size. The competition drawing by Mr. William Coward, age 21, which is a first-prize one, is exceedingly good as a whole, with bold and flowing curves, yet uniting stability in construction. The second-prize drawing by Mr. George Budd is very creditable.

Kindred exhibits in carriage-building are shown by the Institute of Methods and Results, Manchester, and a number of drawings are also displayed upon the walls of the corridor, illustrating the instruction given in carriage-building, &c., in special trade schools, Newcastle-on-Tyne and Worcester. St. Mark's Technical and Drawing Classes for Coach Artisans, Mr. Thomas Coward, secretary, George-street, Grosvenor-square (Space 1,507A), exhibit a large number of drawings illustrative of lessons in practical geometry, solid projection, and coach-making details. Accompanying the above are a series of written questions and answers in coach-building by students of St. Mark's, such as are required in the annual examinations of the City and Guilds of London Institute. The drawings are well calculated to effect the object of practical or technical instruction in the somewhat complex craft of coach-making. Of drawings connected with building construction, we have in the same corridor a number in relation to home and foreign chemical laboratories shown by the Technical College, Finsbury. Then we have Professor Armstrong's Working Tables, Students' Working Tables (Owens College, Manchester, &c.). This large collection of laboratory constructive details consists of those which were used by Mr. E. C. Robins, architect, in illustrating papers read by him recently at the Royal Institute of British Architects. Mr. A. B. N. Kennedy, University College, London, presents plan and photographs of engineering laboratory at that institution, with some results of the work done. The Manchester Museum Committee display upon the corridor walls a collection of pictures for schools, by means of which it is sought to lead children to take interest in objects represented in the pictures in books describing the objects, in the processes by which the pictures were made, and in art. There are two or three exhibitors absent from the corridor, and one particularly whose absence we noticed in connexion with the workshop group of exhibits, although he is duly catalogued in both departments.

Coming to the exhibits on the basement-floor the Britannia Company, Colchester (Stand 1,523), display a large number of lathes, some of them specially adapted for boys in workshop schools. On this stand there are also on view a circular saw for foot or steam, and fret-saws for workshops and for ordinary use. The assortment is varied, and although most of the lathes are of the ordinary description, they are apparently strong in make and moderate in price. Messrs. Melhuish & Sons, Fetter-lane, E.C. (Stand 1,524), exhibit a very large and varied collection of carpenters', joiners', cabinet-makers', and other woodworkers' tools, with amateurs' lathes for wood or metal. All kinds of carvers' and engravers' tools are also on view, as well as two very noticeable carpenters' benches, with sliding instead of fixed check, and a screw at the back end as well as one at the nasal place in the front. These benches have a drawer, and are of solid beech, the end screws working the sliding-check being of hornbeam wood. The vice at end of sliding-check will prove very serviceable to woodworkers in performing a number of operations where a tight grip is needed. These workshop benches have been manufactured in the Black Forest, Germany, and for strength and immobility they are not exceeded by any bench in the British Market. All their parts are well put together, and they could scarcely be produced in this country at the price for which they are sold. The exhibits of all kinds are of good manufacture. Mr. John Henry Evans, Wardour-street, Soho (Stand 1,525), exhibits four particular lathes, one self-acting slide, and screw-cutting lathe, a lathe with requisite fittings for ornamental turning, and two smaller lathes for youths, or for ordinary technical workshop school purposes. The 5-in. central lathe fitted with oval and eccentric chucks and other adjustments, is a very fine machine for ornamental turning. Beautiful designs can be worked out by certain arrangements, and the exhibitor himself, who is a practical turner, will be seen occasionally at this stand, showing his dexterity in working delicate patterns in ivory and wood. Messrs. Holtzapffel & Co., Charing-cross, S.W. (Stand 1,526), are well known in connexion with the production of lathes of the best kind. One of the family is the author of a book on lathes and the turnery art, which has run through several editions, and a new one is in preparation. Nothing yet produced in the way of lathes exceeds the general good workmanship and finish

of the lathes of this firm. The ordinary machines are fully up to the mark, while those intended for ornamental turnery are simply exquisite, if we can apply the term to describe their perfection, or rather, let us say, their excellence in finish in all their details. The work in ivory representing Gothic church architecture, cinque-foil sinkings or cuttings, Perpendicular and geometrical tracery, and other details, is all lathe work. There are also on view ornamental turnery, representing vases, chalices, finials, &c., executed by the instrumentality of the ornamental lathes by the adjustment of certain chucks and slides necessary to be used in the production of higher class and complex ornamental turnery. This firm show a portable forge for ship riveting or for repairing work in connexion with other trades. Mr. Thomas J. Syer, Finsbury-street, E.C. (Stand 1,527) has on view some workshop benches intended for colleges or technical schools where some manual exercises in certain trades form a part of the teaching. There is one long bench fitted for four pupils, but capable of working six at certain operations not requiring such a lengthened space as planing up long pieces of scantling. This bench is supported on metal standards of an ornamental pattern, and fitted with four patent grip irons, which take a hold almost instantaneously. A second and shorter workshop school-bench is also shown, of a very serviceable kind, together with bench knives, holdfasts, mitre machines, and sundry other tools needed by carpenters, joiners, and other woodworkers.

We have now noticed all the appliances, models, plans, &c., we found in position on the occasion of our visit in the class relating to handicraft teaching in technical and apprenticeship schools. As we have said already, there will be found a large number of exhibits also in the building of the Central Institution of the City and Guilds of London in relation to elementary trade teaching in primary schools. If it be deemed necessary, these exhibits may come in for a separate notice, particularly that portion bearing upon primary schools in France. From what we have described in connexion with British exhibits an insight may be had of the effect of the movement in favour of technical education in the British Islands. Manufacturers will, of course, be ready to supply all sorts of appliances, apparatus, and fittings for the possible wants of boys as well as men; still, though class instruction in various ways may prove valuable as a preparatory course, and as means to an end, the regular workshop must constitute the best training school for the turning out of skilled workmen.

BATHS, LAVATORIES, WATER-FITTINGS, &c.

CLASS XXXI. is mainly devoted to baths, lavatories, and other appliances necessary for personal cleanliness or curative treatment. These exhibits are, for the most part, located in East Central Gallery C, but there are some other exhibits of the kind scattered about in various parts of the Exhibition. These we will refer to further on, but must perforce include in the present notice mention of such water-closets, urinals, traps, &c., as may be necessary in connexion with the stands mentioned; for though the majority of such appliances are exhibited in the South and East Annexes (see our previous notices), the classification is very imperfect. We commence, then, by taking the first stand in East Central Gallery C, viz., No. 927, that of Mr. George Jennings, of Stangate, who exhibits some excellent tip-up and other lavatories, among them a double lavatory fitted with patent shampooing apparatus capable of being used for either basin. This is a very convenient arrangement, and is likely to be much appreciated in clubhouses and other similar establishments. A combined lavatory and urinal, with automatic flushing arrangement, is likely to find much favour in situations where space is limited, and where convenience and sightliness are desiderated. For billiard-rooms and other situations, Jennings's concealed lavatories for angles or other positions may be commended to the notice of visitors interested. A housemaid's sink with flushing rim, butler's pantry and wash-up sinks for kitchens and sculleries, some good plumbing and brass work, besides a useful though not very elegant water-pot or drinking-fountain, and Jennings's self-cleansing ball-traps, are among the miscellaneous contents of this stand. The chief exhibits of this firm, however, consist of a very complete

bath and lavatory, fitted *en suite* with some excellent cabinet work in mahogany of exquisite marking. This cabinet work has been made by the exhibitors from designs furnished by an architect. The workmanship is excellent, but we cannot speak in unqualified terms as to the excellence of the design, of which the weakest parts are, in our opinion, the "broken" and curled pediments, and more particularly that over the lavatory. Nevertheless this kind of thing is sure to find admirers among the votaries of the so-called "Queen Anne" style. The bath itself is fitted with all recent improvements, including a mixing chamber for the hot and cold water, so that the blend of hot and cold water having been made to the bather's fancy, he has only to turn on one valve each for douche, spray, sitz, or shower. The lavatory is fitted with shampooing apparatus. In the rear of these exhibits, Mr. Jennings shows his new pedestal-vase wash-out closet, with trap inside the pedestal, which stands well clear of the wall at back and sides, and needs no boxing-in in front. There are no valves, cranks, or levers below the seat, which is hinged so as to turn up and allow of the use of the closet as a slop-sink or urinal. By the peculiar square shape of the basin a full depth of water is obtained at the sides. The outgo is at the front. At the back, just below the water-line, is a row of small holes, through which fine jets of water issue each time the flushing arrangement comes into action, there being also a flushing-run at the top of the basin. The water issuing from these small holes is intended to facilitate the clearing of the contents of the basin by driving them down the outgo, but the provision of these holes is a detail as to the wisdom of which we are not quite persuaded, for it seems to us to be quite within the range of possibility that these fine holes will become clogged up, so that the closet will lose in efficiency if its efficacious flushing be dependent upon their being kept clear. Apart from this detail, however, we think the form of the closet is highly to be commended, and it is one of the best things of its particular kind in the Exhibition. Its external surface may be made as ornamental as fancy may dictate, or it may be left perfectly plain. Being of earthenware, wholly detached from the walls, and not boxed-in, its whole surface, as well as that of the surrounding floor (which may be of cement, tiles, or other non-absorbent material), may be readily cleansed with mop or house-flannel; and in public institutions, where hydrants and hose are available, a well-directed jet of water will at once cleanse the whole of the space around and under the closet-basin. The abolition of the usual wooden casing or boxing-in is a great gain, as preventing the accumulation of dust and dirt and the harbouring of vermin.

The well-known firm of J. Tylor & Sons, of Newgate-street (Stand 928), have some very useful and interesting exhibits, including a good serviceable bath made of zinc-plate, one-eighth of an inch thick. This bath fills very quickly through clear-way valves, and is emptied very rapidly by a 3-in. valve outlet. Messrs. Tylor also exhibit two sample bath-rooms. One, that for a first-class house, is provided with a 5 ft. 6 in. copper bath, with rounded bottom, 2-in. quick waste, wooden cradle, and walnut top and skirting. The lavatory *en suite* has a polished walnut casing with tile panels. The bath-room for a second-class house is provided with a 5 ft. 3 in. galvanised tinued iron portable bath, which requires no casing in, and may be readily removed, as a tenant's fixture. Some good lavatories are shown at this stand, including one with a flushing-rim basin. There are also shown some strong and serviceable barrack or school lavatories, some with treadle-motion supply and wastes and some with quadrant motions. By either motion the basins are very quickly filled and emptied, the waste-outlets being unusually large. These lavatories are admirably adapted for military or police barracks, or for schools. They are provided with Tylor & Sons' patent "waste-not" self-closing, non-concussive tap, which appears to make good its claim to the possession of the three qualities indicated by its name. It is regulated to discharge about two gallons of water, but can be made to run more or less if required. It cannot be made to run a continual stream, but closes of itself should the handle be fastened open. The same exhibitors' trough lavatory range, with slate top and skirting, and with irremovable spindle-plug wastes

is very strong, and well calculated for use in schools. The wastes and overflows immediately disconnect themselves by discharging into an iron trough, so constructed and fixed that without removing any parts the wastes and overflows are accessible for cleaning, should stoppage take place. Tylor & Sons' improved stop-sink is provided with an after-flush, and has other good points in its favour. Their "flush-out" urinal, supplied by automatic syphon cistern, is worth attention from the fact that the trap through which the discharge from the basin takes place is at a higher level than the bottom of the basin, which retains just sufficient water to cover the bottom about 1 in. in depth. The outlet also serves as a trap at the head of the discharging-pipe. Door-action urinals and closets, Tylor's automatic flushing-cistern for urinals (which can be set to discharge at stated intervals), and the "model" waste-not syphon cistern, are all well worth the inspection of visitors. The same firm's patent "universal" disconnecter trap and connectors, for cutting off soil-pipes from direct connexion with the drain, are also worth notice. The trap is capable of easy inspection, and as the connectors fit into one another, the depth at which the drain is laid is immaterial. Among the water-closets exhibited at this stand are Tylor & Sons' "clear-way" regular valve-closets, and their valve hopper and ships closets fitted with Terry's patent time-economising pedal action. These are well worth notice, as is Bean's improved iron hopper closet, fitted with the "model" waste-not cistern. A little contrivance known as Tylor's patent grooved joint for connecting lead-pipe without solder is not so generally known as it apparently deserves to be. We are informed that a joint so made will stand 40 lb. pressure. This joint is allowed by the Canterbury and other water companies. Water fittings are, and always have been, a speciality with these exhibitors. Besides a great variety of water-closet and bath valves and fittings, they show their "City of London" water-post or street well, fitted with their "model" waste-not cistern, as fixed for the Corporation of London in the courts and alleys of the city, under constant supply from the mains of the New River Company. The water-post cannot be left running, and only yields one painful at each turn of the knob, and for it to do this the knob has to be held by the person who comes to draw the water. When one painful has been obtained no more will flow no matter for how long a time the knob be held back. When the knob is released, the cistern rapidly fills, and another painful can be obtained, and so on *ad infinitum*. Another special feature at this stand is Tylor & Sons' patent automatic district water-meter, by the use of which water companies are able to tell in what districts supplied by them water is running to waste. A triplicate set of 8 in. patent water-meters and sluice-valves are to be seen in full working operation close to the great fountain in the grounds of the Exhibition, registering the quantity of water supplied to the fountain. Scott's patent callipers, for measuring the thickness of large iron water-mains, are gigantic in size, but simple and easy to use.

But unquestionably the most interesting exhibit to be seen at Messrs. Tylor's stand is the "Bell Waterphone" and Tylor's patent "Sound-connector," for detecting waste of water in any house where it is going on, without actually inspecting the fittings of the said house. The street in which excessive waste occurs can be found by the aid of the district meter, but a difficulty occurs, in towns where no stop-cocks are fixed outside the houses, in ascertaining the exact premises where waste is occurring. This difficulty appears to be admirably met by the "waterphone." In towns where the value of water or the amount of the water-rating renders some expense permissible, the arrangement for bringing the supply-pipe within the reach of the inspector consists simply of a piece of iron pipe, merely clipped on to the supply-pipe, and carried up to the level of the surface of the pavement, terminating in a cap, the top of which has the appearance of a piece of iron about as large as a penny-piece let into the pavement. This piece of pipe is the "sound-connector," and on the end of the little disc of iron which forms its top the inspector rests the lower end, of the "waterphone," which is merely a solid stick of wood, fitted at the top with a vulcanite bell or trumpet-mouth, somewhat resembling in ap-

pearance the "receiver" of a telephone. Applying his ear to this, the upper end, of the waterphone, the inspector (or any one else) can at once distinctly hear when water is flowing through the supply-pipe. The inspector makes his rounds at night, when all cisterns (where they exist) should be full and the occupants of the houses asleep, and when, consequently, there should be no flow of water through the supply-pipe from the main, unless there be defective fittings or gross carelessness. Where such a flow is detected (as it can be, instantaneously and unerringly, by the use of the waterphone), the inspector uses his discretion as to whether he will arouse the inmates of the house or call next day to inspect the fittings. This system is being used by the New River and other companies, who have largely adopted the constant-service system, and it is certainly a most ingenious, though a very simple, application of a known scientific law to a new requirement. It may, indeed, be said to be merely a modification of the stethoscope. All visitors to the Exhibition interested in the problems connected with the water supply of large towns should stop at Messrs. Tylor's stand, where, by the courtesy of the gentleman in charge, they will be enabled to test the use of the waterphone for themselves.

Messrs. Shanks & Co., of Barrhead, near Glasgow (Stand 929), are exhibitors of some of their specialities, including their "Eureka" spray and plunge bath. This bath is made with a circular end, widening out from the other part of the plunge-bath. On this circular end is mounted the canopy, which is circular on plan. By this arrangement the spray jets all converge to the centre, and ample room is provided for the bather. The fittings include a hot and cold water mixing chamber, and the waste-pipe is on Shanks's patent principle. This firm's needle-bath, a skeleton-like construction of copper and brass tubes, with hip-sprays, and douche and shower at the top, is well noticed, as being well adapted for use in hospitals and other public institutions. The "Universal" combined bath and fittings shown by this firm possesses many advantages. It is cheap, and needs no casing. The waste-pipe, in which the overflow and waste plunger works, is cast solid with the body of the bath in one casting. This bath is readily fixed, and the soap-dish, taps, &c., are within easy reach of the bather. The same exhibitor's wardrobe-bath presents a combination of sitz, plunge, and shower bath, all inclosed within a wardrobe-like cabinet, an arrangement which has the merit of not occupying much space, but the plunge-bath is contracted in size. Some good fireclay sinks, enamelled inside, are shown at this stand, also folding and other lavatories.

At the next stand, No. 930, Mr. Josiah Webber, of Greenwich, exhibits the "Olynthion," a bath by means of which it is claimed that the doctor may secure in the patient's home the best therapeutic effects of a hot or cold air bath, facilities being given for medical observation and control.

Stand 932 is occupied by Mr. S. Owen, of Fann-street, who shows a variety of bath and other valves, and the patent "Comfortable" bath, the special point in which is that it is provided at the wide end with a raised seat for the bather. The bath is of cast-iron, enamelled. Mr. Richard Crittall, of North-street, Manchester-square (Stand 933), is an exhibitor of a completely-fitted bath-room, provided with an improved "Roman" bath, which has the hot and cold valves, waste-pipe, &c., all connected to the bath, requiring no separate fixing.

Messrs. B. Perkins & Son, of Bermondsey-street (Stand 934), exhibit gas-heated baths, and the "Hecla" water-heater. These heaters are fitted with the exhibitors' patent atmospheric burners, and some of them are provided with linen-airers.

Mr. Thomas Waller, of Fish-street-hill, exhibits (Stand 935) an improved open or plunge bath fitted with spray, and combined with a hot-closet for warming linen and towels, the warmth being obtained from the hot water cistern.

Stand 936 is occupied by Messrs. Clements, Jeakes, & Co., of Great Russell-street, who show, besides a variety of gun-metal water-fittings, a bath-stove and boiler, and a hot water circulating cistern. They also show an improved needle-bath, fitted with marble screen and tile floor; together with sinks and wasting troughs.

Messrs. R. Ewart & Son, of Euston-road,

exhibit in action, at Stand 937, the "Moncrieff" bath, fitted with ten services, and encased in panelled and carved walnut. The "Challenger" bath with boilers, a gas-bath, and specimens of portable baths, are also shown here.

At Stand 938, Mr. John Smeaton, of Ludgate-circus, exhibits a very good spray-bath, combining spray, shower, douche, rose, and wash. This bath is one of the best in the Exhibition, though by no means the most expensive. This exhibitor also shows lavatories with tip-up and pull-out arrangement. The Bachelor's bath and lavatory, combined with wardrobe, is worth notice. Some good water-closets, the Smeaton cast-lead "Eclipse" trap, hospital and other slop sinks, and some excellent specimens of plumbing work, are shown by the same exhibitor.

The West Central Sanitary Engineering Company, of which Mr. W. Smeaton, sen., is the manager, exhibit, at Stand 939, a combination spray and wash bath, also a needle-bath with cistern above. A sitz-bath with a novel arrangement of valves, &c., deserves the special attention of visitors. Lavatories, kitchen sinks, and housemaids' slop-sinks are also shown at this stand.

Messrs. J. Allen & Son, of Marylebone-lane, exhibit (Stand 970) their specialities in the way of portable Turkish hot-air and vapour baths. By means of these simple appliances, readily conveyed from place to place in a small box, a hot-air or vapour, or a medicated or mercurial bath, can be obtained with ease and completeness at home or abroad. Those who have not seen these appliances should take an opportunity of doing so when they visit the Exhibition.

Stand 971 is occupied by the North British Sanitary Engineering Company, who show an improved hip-bath. Messrs. John Hall & Co., of Stourbridge (Stand 972), exhibit their patent enamelled porcelain bath, for which no casing is required, as it is enamelled outside as well as inside. This, and the enamelled sinks and troughs for various purposes shown by the same firm, are very cleanly in use. White and coloured glazed bricks are among the other exhibits of this firm.

Messrs. Doulton & Co., of Lambeth (Stand 408 in the Central Gallery), exhibit some very good baths, water-closets, and other sanitary appliances in and about the four angle-buildings which are grouped about their central pavilion or trophy of Doulton ware and Lambeth falence. One of these corner buildings is fitted up as a bath-room, and contains a porcelain bath and one of the "Lambeth" instantaneous water-heaters, in which, by a simple arrangement, the act of turning off the water turns off the gas. This heater is to be seen in operation in the gentlemen's lavatory overlooking the gardens, near the clock-tower. The bath is provided with locking apparatus for the prevention of the waste of water, it being impossible with this apparatus to open the hot or cold supply-valves while the bath waste or discharge is open. The "Lambeth" valve-closet, with stoneware trap, inspection-cap, and ventilating socket, is made for fixing entirely above the floor level. This firm are exhibitors of other good water-closets, foremost amongst which we must place their patent "Combination" closet, so called because by turning up the seat the closet is available as a urinal and as a slop-sink. The closet, which is to be seen in action in the gentlemen's lavatory before mentioned, is of the "wash-out" or "flush-out" type, with front outlet, and the form of the basin is such as to retain an adequate depth of water. Externally, the closet-basin and its trap are of decorated stoneware, the closet being intended, like one already referred to, to be used without any wooden casing-in or enclosure, with the same attendant advantages in the direction of cleanliness and accessibility. This closet may be flushed either by a direct self-acting seat arrangement, or by pull-down handle or chain. Altogether it is a most effective and simple closet. A form of closet somewhat resembling this was suggested in our columns by Mr. E. J. Tarver in September last. In the lavatory already referred to are also to be seen Messrs. Doulton's stoneware trough urinals, which always retain a good supply of water, and are cleanly and effective. The troughs are thoroughly flushed out at intervals by means of Doulton's patent automatic flush-tanks and syphons, which are also shown in action in one of the corner buildings opposite the domed pavilion which constitutes the chief exhibit of this firm. These excellent flush-tanks possess several recommendations, in-

cluding simplicity of fixing, freedom from moving parts, facility of inspection, and instantaneous action even with drop supply. Slop sinks, butlers' sinks, and kitchen sinks in enamelled earthenware; the "Lambeth" trough urinals and closets, with good method of flushing; lavatories and lavatory basins; and stoneware for sanitary purposes, are among the other exhibits shown by this firm. One of the specialties in this line, to which we may refer a little in detail, is the patent enamel-glazed (inside and out) stoneware pipes, for drains which have to pass under houses. These pipes are made longer than the usual drainpipes, in order to reduce the number of joints, which are, if we understand aright, a new form of Stanford's patent joint, with a give-and-take or ball and socket motion to allow of some degree of settlement in the ground without breaking the pipes or causing leaky joints. We have yet to be convinced, however, that any precautions of this kind are to be compared, on the score of reliability, with properly-jointed pipes (Stanford's joint, for instance) laid on a foundation or bed of concrete. Plumbers' brass-work, water-waste preventers, grease-intercepting traps, and cognate appliances too numerous to specify, go to make up what is, regarded merely in its practical aspect, a very interesting and important series of exhibits.

But we must break off here, reserving for a future article the notice of a number of kindred exhibits.

SCHOOL FITTINGS AND ACCESSORIES.

SINCE our former notice,* considerable additions have been made to this section of the Exhibition, and in Classes XLVII. to LVII. in the Albert Hall a fair collection of educational appliances is brought together, although many exhibitors whose names are down in the catalogue are not yet to be found, and a comparison with the advanced Belgium system can now be more easily made, in which it will be seen that in technical education and object teaching we are not to the front. There are, however, points in our method which might with advantage be copied by our neighbours, whose way, we have shown, is very systematic, whereas a great deal of individuality marks the procedure of our own country, which allows a greater scope in special cases, and tends to prevent a dull uniformity or monotonous level from circumscribing the attempts of the ambitious few who object to be trammelled by precedent.

The "Kindergarten" system is beginning to be recognised as the right principle, and is making fair headway in spite of many conservative obstructionists, and an amusing and instructive process of "educational printing" for children is shown by Mr. M. Farmer, Albert Works, 34 and 36, Britten-street, Chelsea (1,372), which process is the same as that adopted in many offices of transfer copying by means of a gelatinous sheet and prepared ink on ordinary paper, on which the various subjects and objects are ready drawn, and can be printed off by merely damping and pressing to the number of fifty to eighty copies. Each letter of the alphabet is thus represented, and some of the figures have a tendency to the facetious, which would serve as an additional inducement to children, or even their elders, to take considerable interest in the reproduction.

The Midland Educational Company (1,380), of Birmingham and Leicester, show several useful diagrams relating to physical geography, astrology, and manufactures, and charts showing the depths of the ocean, action of tides, and other marine phenomena, and have also some examples of the ordinary school-desks and fittings, but with no special points of importance.

The Educational Supply Association, Limited, 42A, Holborn-viaduct (1,383), have some good school furniture of the regulation type, a speciality of theirs being illustrations of trades in which the various artificers are grouped together at their respective occupations in singularly inartistic drawing. It is the ordinary lithographed trade article, and contrasts unfavourably with many good drawings of a somewhat like character to be seen elsewhere, and as we understand that the sale has been large, it is to be hoped that for the future a little more life and character will be imparted to the drawing, as children are becoming accustomed to good work, even in the nursery.

The North of England School Furnishing Company, Limited (1,384), of Darlington and

Newcastle-on-Tyne, send one of the best collections, both as regards size and quality; and attention may be called to Glendenning's patent adjustable desk, which may not be known to many of our readers. It has horizontal and vertical adjustment for both seat and desk, and a movable pad to fit the hollow of the back to prevent stooping, and force the back into an upright and healthy position, which on trial will be found very comfortable. The same remarks apply to a music-chair by the same inventor, and some well-drawn cartoons on the wall show the difference of the positions obtained. The "Darlington Secrétaire" shown by this company, is a piece of furniture designed by an architect, but more suitable, perhaps, for the library than school-room or office; although it has many points which would make it serviceable in any of these places. Another novelty is a raised map of the United Kingdom in a tray or dish into which water is poured, so that the sea is represented by the water, and gives a good idea of the proportion of our surroundings, and the position of the various islands and channels, and as children are specially fond of water as a plaything this seems a good method of leading their tastes to a useful end.

The next five exhibitors, Messrs. George Hammer & Co., Messrs. H. & G. Edwards, Messrs. Wake & Dean, Mr. John Heywood, and Mr. G. E. Hawes (1,385 to 1,389) all send sound and serviceable desks and furniture, such as we have seen before, but they have nothing new to describe; and adjoining these spaces is a stand belonging to J. Curwen & Sons, 8, Warwick-lane, E.C. (1,391), who show the musical notations in use in the elementary schools of Great Britain, and by the diagram we see that the staff notation is used to the extent of nearly one fourth against the remainder, where the tonic-sol-fa system still unfortunately holds its own. As we are upon the subject of music we will for the moment omit the next few exhibits, and turn to No. 1,418, the Musical Reform Printing and Publishing Company, 74, Fann-street, E.C., who apparently advocate a simplified staff notation, and introduce the keyboard stave, which, according to their theory, sweeps away all the difficulties and anomalies of the old system; but as this cannot be adopted without re-writing all the music in the world, what is the practical value of it?

Messrs. Garret & Nisius, 76, Rue de Rennes, Paris (1,392), send some children's desks and seats on the English system, small and few, but fairly good; and adjoining them are some regulation desks and fittings by Messrs. Hodgkinson & Clarke, Canada Works, Small Heath, Birmingham (1,393), who also have erected a partition for the division of school-rooms on the revolving-shutter principle. The next subject which takes our attention is (1,424) the shorthand system shown by Emile Duployé, 23, Quai d'Horloge, Paris, who would revolutionise shorthand by the adoption of his method, of which a specimen is given in ordinary reporting style, in which some of the words are written alphabetically in full and taught in twelve hours; the translation being, "This system thoroughly removes all difficulties in acquiring the art of shorthand; it is so simple that a child can learn it, being taught at school to children before they can read and write. The insertion of vowels renders a transcript easy to make at any distance of time, and it is briefer than any other method in the world." This seems a royal road to learning, but we presume in this, as in other cases, authorities will differ. There are numerous exhibits which follow, containing educational works, maps, diagrams, and incidentals of general and every-day use, and by which many well-known firms are represented, but of course are too well known to require capitation; and in Class LI., which includes material for science teaching, instruments and apparatus predominate, which may be of interest to specialists, but not to the general reader, whose views may, perhaps, be appealed to by some Dutch models of food parasites shown by Paul Osterloh, Fabrikant von Botanischen und Zoologischen Modellen, Amsterdam (1,468), who sends examples of the fungi of grape and potato disease, and different forms of wheat blight; it is to be hoped the danger from these is not so terrible as the specimens, or that the danger is correspondingly magnified, for these are shown in strong colours and materials, and some about the size of a man's head.

Messrs. Moore Bros., 36, Newham-drive, Liverpool, send some disarticulated members of human and other bodies, sectionised limbs, and

nervous systems of the mussel, cockroach, leech, and such small deer, and we realise that they are indeed "wonderfully and fearfully made."

No. 1,481 is a more cheerful subject, and Messrs. Bruciani & Co., 40, Russell-street, W.C., come with some very fine modelling of fruits, flowers, and figures, and plaster casts as supplied to the various schools of art. Their work is, of course, well known and the standard well maintained here, the acanthus leaf and other foliage being specially good and careful.

The special work of Mr. Wm. Gunston, 30, Tollington-place, N. (1,486) is worth looking at, being historical designs drawn on various materials, suitable for wall surfaces, such as "Sgraffito," which is but yet little used, and consists of one or more layers of thin plaster or cement-composition of different coloured layers laid over each other, and when still wet these are cut through to a depth to expose the desired colour, and either left in line or a large surface can be shown. Another is a painting on canvases of the death of Prince Arthur, and although a monochrome, is fairly effective and suited to its purpose of teaching as may be also of Scripture subjects on tiles and other.

Mr. Stanford, of Charing-cross, includes some of his well-known geographical and geological maps and cognate items, and a stereographical map is so shaded that it quite looks as if the surface is worked in relief, and conveys a good impression of the ranges of mountains and salient features.

Messrs. Terry & Co., Little Denmark-street, Soho, have some good Scripture cartoons and educational pictures, &c., which are block-printed and capable of being washed, and have the additional attraction of being very well drawn, as are also some French specimens, though in a different style, of anatomy and botany of everyday subjects with which the youthful mind comes in contact, although the idea that the French eat largely of snails and frogs will not be dispelled by seeing the carefully-executed diagrams showing the gradual formation or construction of these dainties. In the Central Institution of the City and Guilds of London (the handsome new building in the Exhibition-road) is a collection of works classed in this group, and which are treated separately in another column.

On Tuesday last H.R.H. the Prince of Wales, President of the Exhibition, formally inaugurated the work of the international juries. Subsequently Sir James Paget delivered an interesting address on the relation between national health and work.

HEALTH EXHIBITION.

Group III. Class XXII. South Annex. BATTEN'S PATENT SEWER VENTILATORS AND MAN-HOLE COVERS. No. 150, LOZELLS-ROAD, BIRMINGHAM. See May 21, p. xlii.

BECK & CO. (LIMITED). 130, GREAT SUFFOLK STREET, SOUTH-WARK, S.E. STAND 541, EASTERN ANNEXE. VALVES, HYDRANTS, METERS, STREET BOXES, ROAD WATERING PUMPS, PUMPS for Hand and Power. Patent Water-Waste Preventing Cisterns and Water-Closets. Fire Extinguishing Appliances, &c.

Group III. Class XXV. No. 715, Central Annex. VENTILATORS for ROOFS of HALLS, CHURCHES, SCHOOLS, HOUSES, DRAINS, SEWERS, &c. W. P. BUCHAN, S.E. { 21, Roulzow street, Glasgow.

THE COALBROOKDALE CO., Lim. SHROPSHIRE AND LONDON (Holborn Viaduct). STAND 577, Class xxiv., &c., East Quadrant. No. 74, CENTRAL ANNEXE.

MEAKIN & CO. Baker-street, W. SASH PULLEYS, SASH FASTENERS, AND NEW PATENT SASH FOR CLEANING.

LIGHTNING CONDUCTORS. SANDERSON & CO. (Richard Anderson, Proprietor). Contractors to the War Department. Sole Inventors of the Solid Copper Tree Lightning Conductors. LEADENHALL HOUSE, 101, LEADENHALL-STREET, E.C.

STAND No. 382. South Central Gallery.—STONES' Sound-proof SWIVEL PARTITIONS. Stones' Revolving Shutter and Division Stand No. 1141, Western Gallery. Steam Hoist, showing the working of Stones' Automatic Safety Shutters for closing openings. JOHN STONES, Cre Mills, Ulverston.

EAST GALLERY, STAND 860. W.M. WOOLLAMS & CO. Original Manufacturers. ARTISTIC WALL AND CEILING PAPERS. No. 110, HIGH-STREET, near MANCHESTER SQUARE, W. (free from Arsenic).

GLAZED BRICKS. Stand 841, East Central Gallery. The WORTLEY & FIDELAY CO. Elland road, Leeds. Only award to English makers. At International Medical and Sanitary Exhibition, 1881.

* See p. 812, ante.

The Builder.

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SATURDAY, JUNE 23, 1894.

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Technical Education at Home and Abroad.*



RESUMING the subject of our heading, we come now to that of technical education proper, as illustrated in the establishment and conduct of special trade and technical schools abroad, and the courses of instruction they supply for those intended for industrial pursuits. We must, perforce, from the great variety of those schools and classes of instruction as reported upon by the Royal Commission, confine our notice to a few leading types. There are a number of evening schools available for artisans in France and other Continental states, designed for the instruction of apprentices and others during and after their term of apprenticeship, and for adult workmen occupied during the day at their ordinary work. In these very useful schools, drawing and modelling, with a view to direct application to special trades, form the staple of instruction, in some cases supplemented by the execution of practical work in the materials of the trade to which the education appertains. Lectures are given occasionally, in addition to the regular school work, on artistic and scientific subjects having relation to various industries, and such lectures are often given under the auspices of the local authorities, or by the various trade societies of masters, or workmen, or both. The Commissioners admit that this system of evening instruction is one of the most striking features of the present condition of educational effort in France. The schools and kindred institutions are many, and corresponding courses of instruction exist in Paris for young women. The Industrial Society of Rheims is a noticeable one, providing evening lectures for artisans. Here there are classes for learning English, and others for free-hand drawing from copies and casts, projection, mechanical, and architectural drawing. The art night schools for artisans exert a great influence on the development of the art industries of France. The École Nationale des Arts Décoratifs appears to be one of the most important of the Paris schools available for evening instruction in drawing. Its foundation in its original form dates as far back as 1765, but it was shortly afterwards

taken over by the Government. It underwent many changes, and it received its present name in 1877. It has sixteen professors, under the direction of M. de Lajolais, and 800 pupils receive tuition. The reputation of this school has been so firmly established that it is stated that many of the best artists and designers in France owe to it their early training.

There are a number of provincial drawing-schools,—indeed, nearly every provincial town has one,—similar to those of Paris. Evening instruction for artisans in Switzerland is wide-spread, the continuation schools being numerous, supplementing the teaching of the primary schools. Drawing is specially attended to in these schools, and in those for girls, needlework. A good type of these schools is afforded by the classes of the local Industrial Society in Zurich (Gewerbe Schulen Verein). They meet on week-day evenings, and also on Sunday mornings. The following subjects among others are taught,—free-hand drawing, four hours per week; linear drawing, three hours; applied drawing for the following trades each three hours per week,—masons, carpenters, cabinet-makers, mechanics, locksmiths, and whitesmiths; arithmetic, two hours per week; geometry, two hours; writing, four hours; book-keeping, two hours; German language or spelling, two hours; French, three hours; English, two hours. The conditions of entering are that students must be sixteen years of age, and must show that they possess sufficient previous knowledge to profit by the instruction. All fees are paid in advance, but poor students, by making application to the proper authorities, can obtain partial or total remission from payment. It must be technical or industrial knowledge that enables the Swiss to forge ahead of more favoured nations, though they possess no mines, canals, or navigable rivers. True, they command water power, and it is utilised by turbines. The Swiss have to bring the raw material, and send their manufactures long distances to the sea-board, and yet they successfully compete with other countries, and in sundry cases outstrip them. In Germany evening instruction is of a varied and practical character, various schools and classes existing. The Berlin Handwerker Verein was founded in 1859 to promote among its members general culture, sound knowledge of their crafts, and good manners. An important Building Trades' School is connected with the Berlin Artisans' Society. To the cost of this school the Minister of Public Instruction contributed 255*l.*, the Municipality 125*l.*, and other moneys came from a bequest.

In this flourishing society, on the visit of the Commissioners, were 148 carpenters, 131 tailors, 95 locksmiths, 82 masons, 75 book-binders, and 681 commercial and other clerks. The total expenditure for 1881-2 was about 1,500*l.* The Building Trades' School is purely a winter school for students of the building branches. The Handwerker Schule of Berlin is a good example of a technical evening drawing-school for artisans. There are twenty-five masters in this school, which is a Government one. It is attended by 470 apprentices and 190 journeymen, who are in all cases recommended and introduced by their employers. Students begin by making outlines from small wooden hand models. In addition to the ordinary teaching of drawing, there is special instruction for each trade by teachers practically acquainted with that trade. Artisans learn projection from models, and from models they pass to plaster casts.

The best evening schools in Austria are the Turners', the Jewellers', and the Building Trades' school in Vienna, which are guild schools. The turners' school is specially a school for apprentices, having 170 pupils divided into two sections, one theoretical and the other practical. It is supported by an influential trade society numbering 1,500 members. The membership of the Turners' Society is compulsory on all master-turners, and the apprentices are bound to attend the school. The term of indentures in this trade varies from three to five years. It is usual after leaving the primary school, at thirteen or fourteen, to go into practical work for a twelvemonth, in order to obtain some power of manipulation, and then enter these classes. The first year the pupils learn drawing, arithmetic, elementary physics, book-keeping, and the technology of their trade, raw material, &c. Modelling, carving, and all the different kinds of turning are learned in the second year. A good reason was assigned by the director of the school for the necessity of the instruction given in this school. It was to the effect that in the workshop the pupils are continually occupied with one kind of work, and thus they never gain a general knowledge of their trade. Unfortunately, this is the case in several of our trades in England, owing to the extensive application of machinery resulting in the splitting up of trades into a number of divisions. This may be good for capitalists, and lead to increased production, but it is destructive to the maintenance of a class of general workmen highly skilled and knowing their trade as a whole. As a rule, evening instruction for artisans in Austria is not as in

* See p. 849, ante.

France and Belgium, supported by the municipalities, but mainly by the trade societies.

In respect to Belgium, evening art instruction for artisans is represented at least by four important schools, with an average attendance little short of 1,200. The boys begin by drawing geometrical forms with chalk on blackboards, passing on to drawing similar forms with charcoal on sugar paper, outline drawing being first practised, and subsequently shading from the cast. In the third year they are led to drawing from life. The drawing, in quality, is well suited for craftsmen, and owing to the rapidity with which the work is performed, they acquire, in the opinion of the Commissioners, sufficient power of drawing for their purpose in a far shorter time than is possible under any art system existing in this country. The evening art instruction in Holland is similar to that of Belgium; but in Holland, as well as in Belgium, there are day apprenticeship and artisan schools possessing noticeable features. In most of the towns of Italy there are evening classes for workmen similar to those described in relation to other Continental countries. The Commissioners are of opinion, however, that in regard to evening science classes or teaching there seems to be nowhere in Europe any systematic evening instruction comparable, as regards the number of subjects taught and the facilities afforded for the establishment of the classes, and for the examination of the students' work, with that undertaken by the Science and Art Department of this country, and recently supplemented in the application of science to special industries by the City and Guilds of London Institute. Notwithstanding this statement, the Commissioners presently acknowledge that in many of the towns visited on the Continent the evening science teaching was conducted by professors of higher standing than, and superior scientific attainments to, the ordinary science teachers who conduct courses in some of the largest and most important manufacturing centres of this country. It is also noted, in case of machine construction, that the models and materials for instruction were superior to those found in similar schools at home.

Coming to the artisans' general technical schools and apprenticeship schools, they form, indeed, a very remarkable class in the Continental system of industrial education. They are, firstly, intended to supersede apprenticeship wholly or partially by a progressive system of workshop instruction in the school itself, and these are considered the true apprenticeship schools; secondly, there are the trade schools for apprentices and journeymen engaged in workshops. These two classes of schools are to be found in most of the European countries we have already enumerated, but it would require more space than we can afford to treat of them in detail. Some brief particulars concerning a few of them, including the building trade schools, must suffice. The school of La Villette, in Paris, is a good type of the first-named class. It is a municipal school for workers in wood and iron. Youths are admitted on presentation of the "certificat d'études" of the primary school, or on passing an equivalent examination. The instruction is free, and is a continuation of that of the primary school and special technical training. The manual work is divided into two courses, in the first year the pupils spend six hours in the shops daily, where they are taught the nature and conversion of materials. In the second and third years the pupils spend six and eight hours per day in the shop, and are engaged in actual construction with the special trade which they adopt. A large proportion of the boys become engine-fitters or pattern-makers, and earn wages, it is stated, varying from 2s. 6d. to 5s. per day, on leaving school. The Havre apprenticeship school is of the same type. In Switzerland, although the watch-making industry gives rise to several small schools, no apprenticeship school of the character obtaining in France exists. There are several apprenticeship schools in Germany for the training of workmen, or foremen, wherein instruction in pure and applied art, combined with practical work in the shops, form an important feature in the course. The

Royal Trade School, Iserlohn, is a school in which industrial art adapted to metal work is combined with handicraft teaching. Westphalia, the district in which this school is located, abounds in ironworks and collieries. The pupils in this school go through a three years' course, and are trained as designers, modellers, wood-carvers, moulders, foundrymen, turners, pressers, chasers, engravers, gilders, and etchers. The subjects of construction are in part theoretical and practical. The school is well fitted with workshops and the necessary appliances. The Trade School at Remscheid is one recently established for the instruction of apprentices in the construction of edge tools and other implements. The morning hours are devoted to instruction in the ordinary school subjects, including the elementary principles of science as well as drawing and design in application to the requirements of the trade. There is a practice from two to seven in the afternoon in the shops. The fees paid by the students amount to 4l. a year. There is a pottery trade school at Höhr, near Coblenz, to assist a small local industry; a trade school at Cologne for the sons of tradesmen and superior artisans; and apprenticeship and trade schools in the Black Forest, in the Grand Duchy of Baden, the seat of a large number of home industries. The Trade School of Cologne (Gewerbliche Fach Schule) is divided into three departments, comprising engineering and architectural drawing, modelling, and decoration, including house-painting. For certain trades the course of instruction is specialised. Again, such industries as clock-making, straw-plaiting, wood-carving, &c., have their schools. At Furtwangen exists a junior school for training cabinet-makers, to which the pupils of the carving-school are sent on one day in the week to learn the principles of furniture construction. Village industrial schools similar to those of Baden exist throughout Bavaria, including weaving, wood-carving, basket-making, pottery, and violin-making. It was only recently that an extensive movement was set on foot in Austria by the Government to establish apprenticeship schools, and there were, up to a few months ago, no fewer than eighty-four schools existing for the teaching of various industries chiefly situated in small provincial towns. Next there is a joiners' school at Vienna, for joiners and woodworkers, which is mainly a winter school, and a school for wood-working at Riva. In reference to the beneficial influence of apprenticeship schools in Austria, Dr. Exner, the secretary of the Lower Austrian Trade Association, and who is the Government Inspector of the Fachschulen, or School of Woodwork, and a member of the Austrian Parliament, states that in some cases new industries have been created by the action of such schools. The Fachschulen have been created to remedy, it is said, the acknowledged defects of the apprenticeship system, and Dr. Exner thinks that apart from the introduction of new handicrafts, their effect has been to develop industry to a great extent in Austria. The defects of the old apprenticeship system of late years are obvious at home and abroad, owing to a variety of circumstances which have often been alluded to in this journal, but these defects do not import that the normal system of workshop training is not the best, provided the apprentice has received previously a good elementary education. There are a number of apprenticeship and artisan schools in Belgium at present. They are free, and are mainly supported by Government and municipal grants. The instruction varies in different schools, being in accordance with the requirements of local industries. There are certain special classes to enable workmen to obtain certificates of competency in sundry branches of industry, drawing being the basis of all instruction, and being regarded as the universal language. The Antwerp Industrial School contains 150 pupils, in five classes. The pupils enter at the age of fourteen and upwards, and remain four or five years. Most of the pupils have already spent more or less time in the workshop, gaining there some familiarity with the practical details of their trade. In the Belgian trade schools specially designed for

workmen engaged during the day in their various handicrafts, there is an absence of manual work. The apprenticeship schools in Holland are at Amsterdam, Rotterdam, the Hague, and Arnheim. Candidates for admission to the Ambachts School, Amsterdam, must be at least eighteen years old, produce a certificate of good conduct, and must have received a satisfactory elementary education. This school was founded by private initiative effort in 1861, for the purpose of teaching handicrafts required in house and ship building. The apprenticeship schools in Holland all receive Government aid, but depend for their maintenance to a certain extent on local subscriptions. In the Ambachts Schools, Rotterdam, articles made in the school are sold to dealers, and orders are executed for the local authorities. Many doors and window-fittings are made for builders, and a variety of builders' ironmongery is produced, as well as other metal-work.

In Italy, though there are technical institutes, no apprenticeship schools proper exist. In a conversation which the Commissioners had with the representative of the Education Department at Wurtemberg, they were informed that there were no apprenticeship schools at that place like the apprenticeship schools of Paris, or the industrial schools of Bavaria. The authorities have held (and, it appears to us, very wisely) that the best place for teaching a trade or manual labour in any form is the regular workshop. They believe at the same time that science and art are subjects which should be taught to the workman, and that a knowledge of theory should go hand in hand with practice. The all-important problem with the Wurtemberg authorities is,—(1) how to give a sound education to all young artisans as they grow up; and (2) to do so without interfering with their daily labour. They are attempting to solve this problem by starting evening and Sunday schools, with the curriculum arranged to suit the wants of apprentices and workmen in each locality. The boy leaves school in Wurtemberg at fourteen, and becomes an apprentice till eighteen,—a term too short except for a few trades or sections thereof. During his apprenticeship the youth attends the Fortbildung, supplementing his earlier education in ordinary literary subjects, and acquiring scientific knowledge bearing upon his trade and drawing. More advanced pupils pursue methods similar to those of the Science and Art Department in this country. The intermediate technical schools for foremen and technical managers, with their divisions into general technical schools, weaving schools, and industrial art schools, and their subdivision into higher elementary technical schools, secondary technical schools, and building, engineering, and mining schools, form a varied and remarkable group of institutions in some of the European States. We can only give a passing notice to the building trade schools existing in Germany, at Stuttgart and Dresden, and in Austria at Vienna. The school at Stuttgart is divided into two mathematical preparatory courses, and three special science divisions—(1) for those engaged in the building trade, (2) for land surveyors, and (3) for mechanical engineering. The pupils pay 36s. per half-year, and no one is admitted under fourteen; while many, having been engaged in practical work, are of mature age. This is in no sense an apprenticeship school, as no practical work of any kind is attempted, but the subjects of instruction are numerous, and with special relation to architecture, engineering, and building construction. The building trade school of Dresden is somewhat similar. There are two types of building trade schools in Austria, the State Trade Schools and the Foremen's Schools. Some of these are only winter building schools, but others embrace a wider range of instruction, and are intended to train men generally for intermediate posts in industrial work. Firstly, the pupils are required to have a fair preliminary education; secondly, the instruction is chiefly, if not exclusively, theoretical; thirdly, throughout the entire course of instruction great attention is paid to freehand and geometrical drawing; ;

fourthly, the most of the students are, or have been, practically engaged outside the school in the work of their trade. Parents make great sacrifices for the education of their children, and the young men themselves work hard during the summer months, to save sufficient money to pay their school fees as well as support themselves when work is slack during the winter.

The Commissioners at some length dilate on the influence of technical instruction in certain branches of chemical industry, including chemical colours, beet sugar, and the alkali trades, giving some noticeable illustrations. The great influence of art schools, galleries, and museums on the Continent available to workmen is also dilated upon. Institutions of this kind in the British Islands are still only in their infancy in the provincial districts, though Birmingham, Liverpool, Nottingham, and, more recently, Manchester, have provided art galleries, and a few interesting collections exist in other large towns.

The portions of the Commissioners' Report devoted to visits to industrial establishments on the Continent, and to various institutions in the United Kingdom, embody a very large amount of useful and instructive information dealing with the science and art teaching of numerous schools, colleges, universities, and institutes. There is frequent mention throughout the Report of the Science and Art Department, what it has done and is doing for the country, and of those other institutions in affiliation with it. It is, perhaps, not to be wondered at that the Commission, or some of the members thereof, should have such high hopes concerning the City and Guilds of London Institute and the Finsbury College, &c.; for are they not claimed to be the children of more than one technically enthusiastic brain? Let who like claim the credit, but thus much we know at least, that a good many years since we mapped out the way for the City Guilds, and repeatedly gave them the advice which a number of them have considered it to be their duty to act upon at last. The City and Guilds of London Institute is intended for all classes engaged in industrial operations,—of artisans, apprentices, foremen, managers of works, manufacturers, and technical teachers. The Council aver that they have no intention of interfering with any existing social institutions, such as apprenticeship, or any other relationship between employer and employed. The aim is to supply further instruction by preparing pupils to more thoroughly profit by workshop training. The Finsbury College, opened in 1883 is designed to serve as a model trade school for the instruction of artisans, and for others intended for intermediate posts in industrial work. It consists of schools of applied science and art. The schools at Elswick, established by Sir William Armstrong; those of the London and North-Western Railway, at Crewe; and Messrs. Mather & Platt's, at Salford, in connexion with their engineering works, testify at least that these large employers attach great importance to the theoretical training of young artisans. In Glasgow, among other towns, the Allan Glen's Institute and the Glasgow College of Science and Art (originally a mechanics' institute) are noticeable institutions. An especial feature of the former school is workshop instruction in the use of tools, a good secondary and technical education also being placed within the reach of middle-class boys. The second named institution has now become one of the most important in Scotland for the evening instruction of artisans, foremen, and others in applied science and art. The Watt Institute and School of Art, Edinburgh, is an important evening school, but it needs funds to become more useful in the field of technical education. Although many of the old and once very useful mechanics' institutes have died out, a number of those remaining are remodeling their constitution in order to keep it level with the needs of the time. In the earlier portion of their "conclusions," the Commissioners say that "great as has been the progress of foreign countries, and keen as is the rivalry with us in many important branches,

we have no hesitation in stating our conviction, which we believe to be shared by Continental manufacturers themselves, that, taking the arts of construction and the staple manufactures as a whole, our people still maintain their position at the head of the industrial world." This is a courageous and encouraging statement. In reference to the foreign system of technical instruction, the Commissioners think that it is not applicable to this country as a whole, and that it should not be introduced without considerable modification. Not only is there a great difficulty, in our opinion, in the way of introducing the foreign system of technical instruction into this country, but there are considerable obstacles in the way of establishing firmly our own at present limited system, though well intended. Long before the cry of education was heard of in the streets, capitalists were combining, and, by the aid of machinery, were revolutionising the labour market. The skilled artisan soon felt that power was steadily thinning their number as general workmen, while multiplying them otherwise as mere sectional hands. Thus we stand to-day face to face in the United Kingdom with a large army of workmen knowing individually only a fourth, an eighth, or a twelfth part of their trade. Let all those youths have by all means a useful education; but how are we to afford them facilities for applying their technical knowledge, supposing they have acquired it, to be foremen or departmental managers, with experience in a workshop or factory, as well as scholastic or theoretical knowledge? The best foremen are those who have graduated for seven years in the workshop, provided they have had a fair elementary education. As regards the building trades, particularly the carpentry, joinery, masonry, bricklaying, plumbing, and plastering branches, the best and most fitting training schools are the workshop and the building in progress. Much may be learned in classes, no doubt, but the workshop bench and the building constitute the most efficient normal schools of handicraft. We consider also that some steps should be taken to encourage and maintain the system of regular apprenticeship. Owing to our advanced systems of industrial education the time of servitude for the apprentice could in most cases be considerably shortened. No difficulty really stands in the way of retaining the system subject to some slight modifications.

In his Report on the schools and factories of America and Canada contained in Vol. II. of the second Report, Mr. Mather assigns greater influence on American manufactures to the general education of the American people derived from their common schools than to their technical schools. The conditions of American industry are, however, in many respects different to those existing in this country. In respect to School Boards in this country it is stated that they should be authorised to establish and conduct science and art classes for artisans. In regard to Ireland the Commissioners were much impressed with the remarkable success attending the system carried out by the Christian Brothers and that of the ladies of religious orders in training children and young persons in handicrafts in Industrial Schools and similar institutions. Manual instruction in the use of tools in Irish primary schools is advocated, and it is thought that artisans might be employed to teach. Compulsory attendance in primary schools is also recommended for that country. The final "Recommendations" which, in the opinion of the Commissioners, require the intervention of the Legislature, are in relation to the wants of public elementary schools, classes under the Science and Art Department, training colleges for teachers, secondary and technical institutions, public libraries and museums, and some special regulations in regard to Ireland, some of which we have already alluded to. Some supplemental general recommendations are also submitted for consideration, and with these the report ends. The length of this article precludes us from indulging in any further independent observations in addition to those made in the course of our subject, but we may, on an opportune occasion again take up the text of technical

education, and show some of those bearings on the future of our artisans and our skilled industries which appear to have been overlooked by the Royal Commissioners.

THE VALUE OF HOUSE PROPERTY IN ENGLAND, AND ITS GROWTH IN A DECADE.

THERE is some practical interest to architects, as well as to others connected with building, in ascertaining what is the approximate value of house property in England, what is the sum annually spent in the increase of that property, and in what parts of the country, in urban as well as in rural districts, the principal building movement is going on. While much of this must be, to some extent, matter of estimate, the means exist of obtaining an approximate answer to the question suggested. But the data existent are divided under so many distinct branches of inquiry that the comparison is somewhat tedious. There are independent Parliamentary returns, not by any means of annual issue, to be consulted, together with the Census returns, the reports of the Local Government Board, and those of the Registrar-General. And when all these sources of information have been consulted and compared, there still remains the open question of the relation between capital invested in house property, and the interest on the same received by way of rental. In some official estimates on which great reliance has been placed this is taken as 10 per cent. We fear that the owners of house property as a mass, if consulted, will by no means admit that such a relation really exists; or even that the more modest ratio of 8 per cent., which used to be taken as normal for house property, now generally obtains. It will probably be safer to take 5 per cent. as the approximate return,—a ratio which, in any case where more exact information is attainable, it will be easy to correct, and which allows of a comparison with other modes of investment which is tolerably exact.

In the census of 1881, 4,833,844 inhabited houses were enumerated in England and Wales; which gave shelter to 25,968,286 persons, or at the rate of 5·37 persons per house. In the twelfth annual Report of the Local Government Board (C. 3,778, p. cxlvii.) the gross rental of the same was estimated at 165,143,300*l.*, and the rateable value at 139,636,307*l.*; or 15*l.* per cent. off the gross rental. If we capitalise the rental at 5 per cent., we have a resulting value of 3,302 millions sterling for the capital value of the property in question, a total which, of course, has to be abated as matter of actual outlay, but hardly so as matter of present value, if we consider the annual earnings by way of rentals to be more than 5 per cent.

On this showing, the average rent paid per head of population in the year 1881-2 was 6·35*l.*, and the average rent per house was 34·16*l.* Capitalised at 5 per cent., the cost of housing each family of 5·37 persons was 684*l.*, or, per individual, 127·23*l.* If house property pay 10 per cent., as estimated in the official returns referred to, the corresponding values would be 342*l.* per house, and 63·61*l.* per individual.

If we now cast back a glance to the year 1871, in order to see what has been the change effected within the decade, we find that the increase of the population of England and Wales has been 14·34 per cent. (C. 2,955, p. iii.), being equal to the addition of 3,256,020 persons to the population enumerated on the 3rd of April, 1871. The number of inhabited houses in that year was 4,259,117, and the gross estimated rental (C. 3,778, 1883, p. cxlvii.), 126,473,924*l.* The number of persons per house in 1871 was 5·23, and the capital value, (on the 5 per cent. allowance) was 593·8*l.* per house, and 111·41*l.* per individual.

On comparing the growth of the population with the increase in the cost of housing an individual, a remarkable coincidence is now to be detected. In point of fact, the increase of value per head is almost exactly the same as the increase of density of population. While

the people have thickened on the ground by 14·34 per cent., the price of housing each individual,—or, at all events, the average gross estimated annual rental for each individual,—has increased by 14·2 per cent. A coincidence of this nature, spread over the area of England and Wales, is not likely to be fortuitous. If it be the expression of a natural law, it is one of extreme statistical value. It is, therefore, desirable to ascertain, as far as practicable, whether the same relation between density of population and rental prevails between different parts of the country in the same year, that prevails between the general average of the whole country in years a decade apart.

The Inner London of the Registrar-General (C. 2,955, 1881, p. 7) covers an area of 78,080 statute acres; while the total area of the thirty metropolitan unions is stated by the Report of the Local Government Board at 75,313 acres. As the populations enumerated in these two discordant returns are identical, it is possible that the area covered by water is included in the former and not in the latter acreage. On this area existed, in 1871, 417,767 inhabited houses, occupied by 3,254,260 persons. In 1881 the houses were 486,286; the inhabitants, 3,814,574. The gross estimated rental of this property in 1871 was 24,103,083*l.* (C. 3,778, 1883, p. cxlviii.); and in 1881 it had risen to 33,384,851*l.* It is difficult to state the true mean for the densities of this large province. In the thirty unions of which it is composed, the number of individuals per house varies from 6·1 in the Lewisham Union to 11·4 in that of St. Giles and St. George. The mean of these extremes is 8·75. The mean of the thirty separate unions is 8·11. The mean arrived at, as in the case of all England, by dividing the total population by the number of inhabited houses, is 7·85 persons per house.

Taking the last-named proportion, or that for the whole area (although it may be considered as under-rating the true pressure of population) for comparison between the years 1871 and 1881, we find that the density, so measured, increased from 7·78 to 7·85 persons per house; the average density being about 46 per cent. more than that for the whole country. The gross estimated rental above cited averaged 57·7*l.* per house in 1871, and 68·2*l.* per house in 1881, being respectively equal to 148*l.* and 173*l.*, for the capital cost of housing each individual. This cost, therefore, was close upon 17 per cent. higher in the latter than in the former year, an increase which almost exactly coincided with the increase of the population housed upon the same area.

It is perhaps beyond the reach of statistical analysis to determine the exact relationship between density of population and cost of housing, for the reason that the same rule can hardly apply in urban and in rural districts, and that it is impossible at present to ascertain the proportion of land that is devoted to residential use. The valuation for the poor-rate in 1881-82, while distinguishing each parish and union, gives neither areas nor numbers of houses, and it is not clear how closely the registration districts and sub-districts named in the census which gives these important details coincide with the parochial limits. The number of houses per area is one element of comparison, in like, but not in unlike, circumstances. The same may be said of the number of persons per house, and again of the number of persons per acre. In the union of St. George's-in-the-East these respective densities are,—23·9 houses per acre, 8·1 persons per house, and 193 persons per acre. The rateable value in this union is 34·3*l.* per house, which may represent an actual rental of 41·5*l.*, or a little over 5*l.* per head. But a very different kind of density is presented by the City of London, in which, while there are now only ten houses per acre, and a registered population of 7·8 persons per house, or seventy-eight persons per acre, the rateable value rises to 68·8*l.* per head, or a rental of 83*l.* per individual. In this case, however, it is the fluctuating day population which demands this large and costly accommodation. The Metropolitan, the Metropolitan District, and the North London Railways carry some 373,000 passengers per

diem to the metropolitan centre. The metropolitan bridges give passage to a still larger number. Thus the 51,306 residents enumerated as the population of the City of London in 1881 represent, by their rental, accommodation for far more than ten times their numbers. It is for custom, rather than for residence, that the houses in this district have been reared of such noble dimensions as to have a mean rateable value of 54*l.* each.

In the suburban union of Lewisham, on the contrary, with an area of 11,436 acres and a population of 73,314, is reared little more than a house per acre, tenanted by little more than six persons each. The rateable value per house is 52·3*l.*, or 8·5*l.* per individual, being almost double the rateable value of the union of St. George's-in-the-East, where, as we have seen, the number of persons per house is 8·1.

These considerations are adduced in order to put the reader on his guard against either taking too hasty a leap to conclusions, or thinking that what we have to suggest as a roughly approximate rule can be taken, in any particular case, without ample provision for correction and verification. This premised, and as an attempt merely to strike out the line of country hereafter to be more accurately surveyed, the figures above cited, compared with a mass of others of the same kind, point to the fact that rent and rateable value are determined by density of population, partly measured per area and partly per house. Both have to be considered, and it is sometimes the one and sometimes the other which becomes most marked in its effects. But we shall not, perhaps, be very wide of the mark if we regard the allowance of 1*l.* per head per number of inmates in a house as coming somewhere between gross rental and rateable value. Thus, for London, the "Inner London" of the Registrar-General, with a general average of 7·85 persons per house, we have an average rateable value of 7·21*l.* per person. For all England, with an average of 5·37 persons per house, we have a gross annual rental of 6·35*l.* per individual.

The proportion between gross rental and rateable value is not everywhere the same. Some counties rank much below the average. The twelfth report of the Local Government Board states that Bedford, in its gross estimated rental at the latest date, was 21·17 per cent., Lincoln 23·99 per cent., and Anglessea 33·22 per cent. under the gross annual value stated in Schedule A of the Inland Revenue returns. In the metropolis, however, the poor-rate valuation in force is only 0·07 per cent. short of the Crown assessment. In the valuation to the poor-rate in all England the rateable value fell short of the gross estimated rental by 15·8 per cent. of the latter in 1871, and by 15·4 per cent. in 1881. In the metropolis the rateable value fell short of the gross estimated rental by 17·7 per cent. in 1871, and by 17·5 per cent. in 1881. These proportions, being calculated from the data of the Local Government Board, are exact, as showing the differences between 1871 and 1881, and as between the metropolitan area (calculated for Lady Day) and England generally (calculated for the 6th of April, 1881).

A rateable value of 7·21*l.* per head in London compares not unfavourably with that given by Sir J. W. Bazalgette, in his address at the Institution of Civil Engineers on the 8th of January last, for some of the most important foreign cities. Thus in Philadelphia, with a population in 1880 of 847,170, the figure cited in the address is 8·7*l.* per head. In Paris, with 2,240,000 people, it is 10·7*l.*; in New York, with 1,206,000 persons, 11·2*l.*; in Brussels, 11·4*l.*; in Boston, 17·8*l.* The numbers of inhabitants per house vary to an extraordinary degree in Sir Joseph's table, from 3·9 in Chicago to 65·5 in Turin. The numbers given for the population of the American cities differ materially from those given in the statistical tables by Mr. J. J. K. Croes, published at New York in July last. As the figures stand in Sir Joseph's table, no relation is visible between the number of persons per house and the rateable value per individual. But considering the different habits of different

countries (comparing, for instance, London and Naples, for which latter city Sir Joseph's figure of 4·4 inhabitants per house is notoriously inadequate) it is not likely that a rule can be very general. It is more to the purpose to observe that of the forty-five cities tabulated by Sir J. W. Bazalgette, London, with its death-rate of 21·4 per 1,000, is the healthiest of all, with the single exception of Christiana. It is also the city, out of all English and American towns of more than 200,000 inhabitants, in which the works for a supply of water have been provided at considerably the lowest cost per head of the inhabitants, and in which the payments made for water are the lowest in proportion to the rateable value of the property.

These considerations are of extreme significance as regards the future course of domestic building in this country. Who is there who, on learning that London doubles its inhabitants in forty years, has not asked himself, where will this stop? Will the bounds of the metropolis gradually enlarge until, at some not incalculable date, they meet those of other great centres of population? Or will some unexpected element of dispersal come into operation to throw the mass of new building on rural rather than on metropolitan areas?

As to this important question, the figures above cited, at all events, hint a reply. If rents continue to increase in proportion to density, as they have done since 1871, the rents over a large proportion of the metropolitan area in the year 1902 will be double those of the year 1881. It may well be questioned whether the law thus indicated, as having certainly prevailed for the last decade, may not carry with it a limiting power. Year by year, as pressure on metropolitan space raises the rate of rent per head, will it become more and more important to inquire whether the advantage of residence in London is worth the cost. Nor should it be forgotten that the ultimate perfection of the telephone may be expected to exert a very considerable influence on the distribution of population. When it becomes possible (as we can hardly doubt will be the case) to communicate with a broker, banker, or other man of business, vocally, from forty or fifty miles' distance as readily as from a suburban residence, one of the elements inducing concentration will be changed. We make no attempt to forecast the future. It is quite another thing to call attention to ascertained facts and to causes of change in actual operation, and to observe what is the tendency of actual movement and change.

Taking the very latest facts on record, the increase of the gross estimated rental for all England in the year 1881 was hard upon five millions sterling, while that for London was nearly three millions sterling. The comparison is very remarkable, especially when we remember that the proportion of inhabitants is twenty-six millions to less than four millions. The exact figures are: Population of England and Wales in 1881, 25,968,286; gross estimated rental in all England (on poor-rate valuation), 165,143,300*l.*; population of "Inner London," 1881, 3,814,574; gross estimated rental, 33,384,851*l.*; increase of population of all England for a mean year of the decade 1871-81, 1·43 per cent.; increase of London for a mean year of the past decade, 1·72 per cent.; increase of nineteen principal English towns for a mean year of the past decade, 1·65 per cent.; increase of gross estimated rental for all England, in the year 1880-81, 2·96 per cent.; increase of the gross estimated rental for London, in the year 1880-81, 8·89 per cent. It should be observed that this last rate of increase is exceptional. From 1871 to 1881 the gross estimated rental of London increased by 38·5 per cent., or at the mean annual rate of 3·85 per cent. But the years 1871, 1876, and 1881 have been exceptional in their rates of increase, showing per centages of 8·16, 7·35, and 8·89 respectively. In 1874 the increase was only 1·66 per cent., and in 1878 1·93 per cent., on the preceding years. This fact has no little significance as indicative of the fluctuations in the activity of the building trade, if it have any other cause than the operation of the revision of the rate-books.

Put in the simplest way, as matter of ascertained fact, without any speculation, the increase in the value of the house property of England, from 1871 to 1881 was at a rate of from 7 to 10 per cent. more than twice the increase in the population,—a difference that may probably be taken to measure the growth of individual luxury. The slight difference of 3 per cent. is that between London and all England. In the former, in the decade, population increased 17·2 per cent.; gross estimated rental 38·5 per cent. In the latter, population increased 14·3 per cent., and gross rental 30·6 per cent. It is, of course, desirable to extend the comparison over a larger term of years. The above cited facts, however, are all that are at present accessible, and of their significance there can be no doubt.

THE BUILDING MATERIALS OF AMERICA.

SOME eighteen or twenty years ago a very valuable record was issued, by the English Geological Survey, of the Quarries and Building Stones of the United Kingdom, and although it was confessedly incomplete, it is much to be regretted that the publication was not continued. It was the old story of expense and no money,—the usual manner in which we in England deal with matters of real utility, while we spend like water for doubtful political purposes. Americans are far before us in these respects, and the frequent reports of their material resources are models of what a country should do. What strikes every student of the United States is, not so much the enormous riches that that great continent possesses in silver and gold (a Tom Tiddlerish way of looking at things which takes the multitude, and is always brought prominently to the front), as the more homely wealth of the earth's resources,—wealth that, in the glare of Californian and Colorado discoveries, was completely thrown in the background. But now that gold and silver have taken their proper places as mining undertakings, the Americans have time and opportunity to examine into the condition of their other mineral treasures, and they may well congratulate themselves on the universal presence and abundance of nearly every metal and rock that are known to science. Although the enormous superficies of the States permits the various formations to extend for long distances, there are some parts,—such as the Rocky Mountains, where the areas of disturbance have been profuse, causing every variety of alteration in the character of the rocks, and an unequalled scope in the choice of ornamental building stones.

The building-stone quarries of America (not including those of limestone for the purposes of flux and lime-burning) are estimated at 1,525, and the product during the census year at 115,380,133 cubic feet, valued at 18,356,055 dollars; and as there are a good number of little quarries worked by one or two hands, of which no account was taken, the annual value of the stone may be certainly placed at 20,000,000 dollars. These quarries are thus tabulated:—

Quarries.	Cubic Feet.
Crystalline and siliceous rocks yielding 313, 20,506,568	
Sandstone 502, 24,776,930	
Limestone and marble 616, 65,523,965	
Slate 94, 4,572,670	

In the first category are included granite, trap, steatite, porphyry, gneiss, serpentine, syenite, &c., Massachusetts and Maine taking the lead with ninety-two and sixty-eight quarries respectively, followed by New Hampshire, Connecticut, Rhode Island, Vermont, and Virginia. These States are the principal areas of that great belt of eozoic rock which enters America from Canada, and forms the backbone of the Appalachian range, dying away in the south as low down as Georgia and Alabama. Maine possesses inexhaustible stores of excellent granite, mostly dark coloured and porphyritic; in Massachusetts, it is lighter coloured and rather finely grained (that of Monson being noted for its large monoliths); New Hampshire

has immense quarries at Concord, its capital, with a wide reputation for quality, and which have been worked continuously for 100 years and more, and there is a remarkably good red granite quarried at Saint Johnsbury Mountain. In fact, the whole of the White Mountains and of the Adirondacks in New York State are of granite, and would supply the requirements of the entire globe. The State House of Vermont is built of fine-grained granite from Barre Hill, serpentine being also largely quarried in the same State, and syenite in that of Maryland. Virginia possesses a number of quarries of grey granite and pink gneiss; as also, though to a smaller extent, does North Carolina. The Western States, consisting largely of level prairie and low river grounds, do not contain granite, or, indeed, any great variety of building stone; but as we approach the vast chain of the Rocky Mountains, we find it in great abundance. It is extensively developed in Colorado, to the west of the Hogback, a wedge-shaped outlier which runs from the Spanish Peaks into Wyoming. The district possesses a vast variety of granites, mica slates and schists, hornblende, felspathic rock, syenite, and porphyry, all of which are largely used for foundations and bridge structures. Some of the dikes furnish red crystalline rock, which is susceptible of a high polish, and very valuable for ornamental work. A favourite building stone in Denver is a fine pink lava, from Douglas County, and a brisk trade is arising from shipping it over the Denver and Rio Grande Railway. There is no lack of granite in California, especially in Placer County, and at Penryn, on the Central Pacific Railway, some twenty-eight miles from Sacramento. It is to be hoped that as time goes on, granite will be more used for building purposes, the houses of the Far West being, as a matter of fact, principally constructed of wood, owing to the vast supplies and cheapness of lumber, though at the same time the foundations are mostly of brick or stone. There is, however, a considerable demand for granite in San Francisco and the largest cities for curbing the sidewalks and street-crossings. The Penryn quarries are amongst the most extensive of the kind in the States, covering some 680 acres, and employing 200 hands. The great reputation of the Penryn granite arises from the fact that it does not change colour by exposure, and that it contains no iron, and this gives it a great superiority when used for monuments, tombstones, or when placed in any position where it is much exposed to the atmosphere. The prevailing shades of the Penryn granite are blue, grey, and black, the latter resembling the black granite of Egypt, and taking a beautiful polish.

Limestone and marble are found in almost all the States, there being 616 quarries, employing 15,646 hands, 190 quarrying-machines, and 499 dressing-machines. Judging from the statistical returns, Iowa presents the greatest activity in limestone quarrying, heading the list with 128 quarries, and succeeded by Ohio with 119. Indiana possesses 65, Wisconsin 46, after which the numbers become small. Taking the States in their alphabetical order, we find that Alabama possesses an excellent white marble, known as "Talladega," as also gray and white non-crystalline varieties, and variegated marbles, all of sub-carboniferous age. Besides these there are magnesian limestones and yellow crystalline marble of tertiary date. Arkansas has an oolitic limestone that takes a good polish; Connecticut has some quarries of dolomitic marble; while the limestone of Florida is of a coralline nature. In Illinois the quarries are of carboniferous age, and yield a great deal of good building stone, that known as Lemont marble being very largely used in the building of Chicago. The Indiana stones are upper silurian and oolitic freestone, and those of Iowa are carboniferous and magnesian. Kansas possesses some very fine black marbles and cream-coloured dolomitic stone, soft and easily dressed. Similar material is also found in Kentucky, together with freestone and limestones of lower silurian formation. In Maryland are a valuable brecciated limestone, known as Potomac marble, and a verd antique, which is extensively worked in Frederick

County. Massachusetts furnished from her quarries at Lee the limestone used in the building of the Capitol at Washington; and New York State is well supplied from the Eastchester and the Sing Sing quarries, as also from the many outcrops of white crystalline limestone of the northern highlands. The cities of Cleveland and Toledo in Ohio are, in a great measure, built of the well-known Sandusky limestone; but in Cincinnati a limestone of the upper corniferous division is most in request and largely worked in the quarries in the neighbourhood.

In the Rocky Mountains and all through the Pacific States, marble is very profuse, and of varied quality. The Hogback, which has been mentioned before in connexion with granite, is composed of cretaceous or Juratriassic formations, and is an inexhaustible source of fine building stone, with two separate parts, formed wholly of limestone; and throughout Colorado generally, there are quantities of breccia, white, apple-green, and clouded marbles. In California there are also great deposits in Tuolumne County,—masses weighing 600 tons having been blasted out, and single blocks dressed, weighing 13,000 lb. Most of the stone is of an unclouded white, but all is fine-grained and extremely hard. Near Suisun, there is a singular stone, which, in its rough state, looks very like rosin. It occurs in heavy beds, blocks measuring from 800 to 900 cubic feet having been frequently raised. On the McCloud river, there is a pure white marble, fit for the most delicate purposes of statuary, though it has been but little worked. It is singular that, with such a profusion of excellent marble throughout the State, the Californian demand, which is always heavy, has been, up till now, met by importations from Italy. Probably, however, when a greater depth of working has been attained, marble equal to the finest Carrara will be readily found. The Californian quarries also yield handsome specimens of Cipolin marble, white, with shadings and streaks of green, together with the Porton or Genesee yellow; and there is a variety known as Ruin marble, a yellowish stone with broken lines, very much resembling the ruins of fortifications.

Sandstone is very generally found throughout the States, but is worked to the largest extent in New York, Ohio, and Pennsylvania, which possess 181, 126, and 96 quarries respectively. The Ohio quarries are on the most considerable scale, having between three and four million dollars invested in them, and with an annual yield of nearly nine million cubic feet. Kentucky, too, possesses vast stores of sandstone in the basin of the Cumberland river, and an excellent stone on the Kentucky and Green rivers, known as Buena Vista stone, of which considerable portions of Louisville and Cincinnati are built. One of the best stones in America for building purposes is the Potsdam sandstone of New York and New Jersey, the latter State containing also a very durable conglomerate known as the Green Pond Mountain conglomerate.

In the Pacific States, sandstone is not so widely developed as limestone, although there are several deposits of very handsome varieties. One of these, a fine-grained stone of greenish gray colour, is quarried at Angel Island in the Bay of San Francisco, and a brown sandstone from Alameda County is largely used in the cemeteries as bases for monuments and for vault construction.

Slate, fit for roofing purposes, is rather limited in its development in comparison with other structural stones in the United States. But ninety-four quarries are worked, producing annually nearly half a million of squares, and of these the greatest number are to be found in Vermont and Pennsylvania. Of other kinds of rocks useful for building we may mention trap, worked pretty extensively in Connecticut, and trachyte, another igneous rock, very common in the western mining regions. It is usually of a pinkish grey colour, and is very soft when taken from the quarry, though it gradually indurates on exposure to the atmosphere.

Building materials, otherwise than rocks, are of importance almost beyond that of their

intrinsic value, inasmuch as they employ so many hands in their preparation. For instance, the making of bricks, tiles, fire-bricks, and drain-pipes gives occupation to 70,000 hands, the annual value of the products being estimated at 34,000,000 dols. Most of the cement is made from natural rock, hydraulic limestone being more or less developed in the majority of the States. There are, however, certain localities which make a speciality of cement production. One of these is Rosendale, in New York State, the rocks of that neighbourhood, which are the bottom beds of the Lower Helderberg group, and the top beds of the Niagara group, containing from 17 to 22 per cent. of silica, 34 to 48 of lime, and about 10 of oxide of iron and alumina. The production in this centre is at the rate of 1,600,000 barrels per annum. Natural cement is also produced in Kentucky and Indiana, and is known as Louisville cement. The total yield of cement throughout the States is about 3½ million barrels, of which Portland cement only ranks at 55,000, the great bulk of this latter, as indeed of all the artificial cements, being imported. The barrel of natural cement, which weighs 300 lb., has an average value of 1 dol. 10 cents, while that of Portland (which is 400 lb.) is 2 dols. 25 cents at the works. All these three kinds, viz., Portland, Rosendale, and Louisville are generally used for work under water, and where great strength and tenacity are required, such as the foundations of heavy buildings, like sea-walls, sewers, light-houses, &c. But while admitting the excellence of the natural cements, there is no doubt but that the Portland, whether made in America or imported, is the most useful, and possesses a greater resistance to crushing than all other cements. The prices in the Western States and those of the Rocky Mountain districts vary greatly. In Denver (Colorado), where about 100 barrels of 400 lb. are turned out daily, the value of this local production is 6 dols. per barrel, that of Portland (375 lb. net) being 7 dols. to 7 dols. 50 cents, and that of Louisville (265 lb. net) being 4 dols. Both the importation of Portland cement and the local manufacture are on the increase, which is due, not only to the actual increase of building everywhere, but to the fact that cement is rapidly superseding lime mortar for ordinary purposes, and especially in large and expensive erections.

A common rock in America is that of steatite or soap-stone, which is used to a considerable extent as refractory linings for furnace hearths, grates, stoves, and foot-warmers, and also for stationary laundry tubs and sinks. It is principally quarried in the New England States, the production being at the rate of 6,000 tons per annum, and the average price at about 15 dols. per ton. *Apocryphally* of limestone and marble, it may be mentioned that some 25,000 tons are annually ground down and sold as marble dust at 7 dols. per ton. The employment of this material is in a truly American fashion, viz., for the generation of carbonic acid in soda-water fountains.

As far as the natural source of plaster of Paris is concerned, it might be produced to an unlimited extent, seeing that such vast beds of gypsum exist in the United States, extending in Texas alone for many hundreds of miles along the head-waters of the Red River. There are also beds of great thickness in New York, Virginia, Kansas, Ohio, Arkansas, and Michigan, those of the latter state belonging to the upper sub-carboniferous formation, the yield of which in 1882 was 701,450 net tons of plaster, and 1,109,810 barrels of stucco (of 300 lb. each). It is somewhat singular that, although New York State has such large deposits of gypsum, most of the plaster and stucco made on the Atlantic seaboard is from imported Nova Scotian stone. All through the Rocky Mountains and Pacific States, there are enormous beds of gypsum, and particularly in Nevada, Arizona, and New Mexico, though the lack of a market renders them practically valueless. In New Mexico it is mixed and made into plaster by the natives, who take it to Santa Fé, and sell it for 1 dol. per bushel. At Socorro, in the southern part of the Territory, gypsum is called "hasped" or "yeso," and is

used as window-lights, and as plaster in white-washing the interiors of their adobe houses. There is a steady manufacture of plaster of Paris at San Francisco, where it sells as follows, per barrel:—hard, for finishing and general use, 2 dols. 75 cents; for casting ornaments and moulds, 3 dols.; superfine, for sculptors' use, 3 dols. 50 cents; while common plaster is ground on a large scale for fertilising purposes, and fetches about 12 dols. 50 cents per ton.

NOTES.

Our Transatlantic cousins are going to carry the war into the enemy's country,—that kind of humane and humanising warfare in which both sides may be the gainers. They are projecting an American Exhibition in London, on a large scale, to be opened in May, 1886; a long date, which seems to imply that a great effort is to be made to represent the products and industries of the States in a manner worthy of the occasion. According to the circular issued by the secretary, General Norton, the Exhibition is receiving the hearty support of the Governors of States and the presidents of the principal railway companies; and the Exhibition "will be truly national in character, and will afford the opportunity to Europeans of seeing the American artisan at work, as we shall have a large building occupied by American workmen (white and coloured) engaged upon their respective handicrafts." Whether there can be anything very special in the *modus operandi* of the American artisan, "white or coloured," as distinct from that of the English artisan, we should question; but it has become rather the fashion lately for large exhibitions to include the spectacle of workers working at their crafts; the public have a fancy that they like to "see how it is done," though we imagine very few of them really learn anything in that way. But, apart from this, which is a matter of detail, the exhibition cannot fail to be of interest, and to contain much that is new to many of us. According to the *New York Herald*, America has never yet been well represented at any great European exhibition:—"At Amsterdam last year we were represented only by a few sewing-machines and parlour-organs," and it is promised that in this London exhibition we are to have a show of natural products such as will be entirely new to London or any other European capital; and with this we have no doubt we shall also see all that our friends over the water can show in the way of mechanical science and mechanical improvements. When we remember the comparatively recent date in the world's history of the settlement of "the Britisher" on the American continent, it is a remarkable spectacle to see the descendants of that small band, now become such a vast and energetic nation, proposing to come over to us and "report progress" on a grand scale. They may be sure of their welcome; and we will venture to predict that the exhibition, if well carried out, will be one of the most popular things of the kind that has ever been organised in London.

The scheme for the New Public Offices, by whomsoever they be built, will involve the destruction of the houses in Spring-gardens. There are many of them veritable Queen Anne buildings, little as they may look like it to those who associate a method of design very remote from the simplicity and quiet of these houses with the name of that ill-used monarch. Much of the detail is distinctively English in character and of an exquisite refinement, and the interior finishings, especially the plaster and ironwork, will well repay the careful sketcher's pains. The old houses should not pass away without an accurate representation of their best features, and we trust that before the white figures of the auctioneer appear on their fronts some earnest admirer of a class of architectural detail which has much that is admirable about it will have made a faithful record thereof.

We give in another part of the present number sections of a high-pressure water-meter designed by Mr. Pendred, whose scheme for a low-pressure meter we illustrated a short time since (page 591, *ante*). The subject comes somewhat *apocryphally* of the recent letter of Mr. Octavius Coope, the chairman of the East London Water Company (in the *Times* of the 24th), complaining strongly of the waste of water and the disinclination of their customers to adopt any means for avoiding or lessening waste. His company have, he says, from time to time made vigorous efforts to establish "constant service," but the result in four of their districts has been the consumption of water at the rate of forty gallons per head daily, certainly far more than is at all likely to have been used in real and legitimate needs by that portion of the population. The constantly increasing size of London and increasing value of water, and the difficulty of keeping pace with the demand, all seem to us to point to the compulsory adoption of a meter system sooner or later, as the only means of ensuring carefulness and absolutely fair charge for what is used. Nor do we believe that a meter system would any more lead to an insatiable parsimony in the use of water than it leads to any inconvenient restriction in the use of gas. The knowledge that gas is charged in proportion to the amount hardly leads any one to restrict the burning of it whilst it is actually in use; it leads people to turn down the gas when they are not using it, that is all; and similarly the establishment of a meter charge for water would lead people to see that their taps and water-closet supplies are not left running, not to spare the use of water; and it would, at the cost of some initial expense, put water charges on a simple and business footing once for all.

In the rooms of the Royal Scottish Academy, Edinburgh, an exhibition of national portraiture is to be opened next month. The special object aimed at in bringing together such a collection is to awaken public interest on the subject of historical portraiture in view of the formation of a permanent National Portrait Gallery which is to be opened at no distant date. The exhibition is to consist of authentic portraits of Scotsmen, or persons intimately associated with the country, whether in politics, literature, science, or art. Such portraits need not of necessity be excellent as works of art; it will be sufficient if they are trustworthy and the subjects interesting. Promises of contributions have been received both from public bodies and private individuals, and it is confidently anticipated that the exhibition will prove a success.

Messrs. BEATTIE & Co. have nearly completed the contract for erecting the building for the forthcoming International Forestry Exhibition at Edinburgh. The building occupies the spacious lawn in front of Donaldson's Hospital, at the west end of the city, and is appropriately constructed of wood, the roofs being covered with felt. The available space within has been fully taken up, and of this 15,000 ft. are allocated to Government collections; trade exhibits, 10,000 ft.; loan collections, 2,500 ft. To the west of the building there is an outside space of about seven acres in extent, which is to be appropriated for glass houses, pavilions, chalets, &c. The Exhibition building outwardly is unpretentious, the only attempt at producing effect being in the projecting roofs of the gables, and turned balusters at the divisions of the gable windows. The lighting during the day is mainly obtained from roof lights, and at night the electric light is to be brought into requisition.

THERE is to be a large and important Loan Exhibition of Paintings, by Old and Modern Masters, held at Brighton in the autumn, in connexion with a general Science and Art Exhibition in aid of the Brighton and Hove School of Science and Art. As the Town Council have granted the use of the Picture Gallery for this purpose, the usual annual exhibition of pictures at Brighton will not take place this year, but it is expected that it will be continued as usual in succeeding years.

THE donor of 10,000*l.* for the establishment of a Gallery of National Historical Portraits in Edinburgh has now come forward with an offer of 20,000*l.* for the purpose of building or acquiring premises for the accommodation both of the National Portrait Gallery and of the Museum of Antiquities. This offer has been made under the impression that the former gift has indirectly had the effect of prejudicing the Society of Antiquaries as custodiers of the Museum of Antiquities. The first proposal was that the Society should vacate the premises at present held by them in the Royal Institution, and remove to new premises to be provided for them by Government. It was contemplated to accommodate the Society in a new wing to be added to the Museum of Science and Art, but this proposal was opposed by the authorities at South Kensington for various cogent reasons. An addition to the accommodation required by the Society is becoming of pressing necessity, and such would be provided in the new building along with the Portrait Gallery. Another advantage accruing from this arrangement would be that an important portion of the Royal Institution would be available for purposes of the School of Arts, the pupils of which are inconveniently crowded. A vacant site for the proposed new building, situated at the north-west angle of St. Andrew-street and Queen-street, is available, at a cost of 7,500*l.* It is conveniently situated, and would afford ample room for the new erection. The donor makes it a condition that the whole sum of 20,000*l.* shall be spent upon the building, and the Board of Manufacturers make an offer of 2,500*l.* towards the purchase of the site, and the Treasury are to be asked to give the remaining 5,000*l.*

THE outbreak of Cholera at Toulon appears to have turned out less formidable than was at first feared, and to be, by latest news, somewhat subsiding; but it is a warning, not to be neglected, of the possible approach of the enemy. The newspaper descriptions of the site of the outbreak are instructive. Toulon is a town with narrow and bad-smelling streets, and where the refuse is emptied into the gutters. After their fright the Toulonaise will, perhaps, think of remedying these defects. The Mayor of the town appears to have acted with exemplary good sense and spirit in advising and aiding his townsfolk.

WE have received a circular or pamphlet, issued by Mr. Laurie, of Paternoster-row, and intended, apparently, to be addressed in turn to whatever Corporation may appear to have the opportunity of starting a Museum of Science, Art, Industrial Products, and Inventions, urging upon them the desirability of inaugurating such institutions for practical and technical instruction. "With the probable addition of two million voters to our electorate," says Mr. Laurie, "is it not incumbent on us to take active steps to raise the general intelligence of those who, for the first time, are to exercise the franchise?" The writer proceeds to make some general suggestions as to the manner in which such Museums should be arranged, each subject to be grouped within a limited space and illustrated with specimens, models, and diagrams, calculated to lead the eye and the mind from the contemplation of familiar objects to the principles which they embody, shown in such a manner as to be obvious even to those who have little "book-learning" to aid their perception. Mr. Laurie goes on to give some examples of the way in which some special subjects should be thus illustrated. His suggestions are very sensible and practical, and deserve the attention of those who are interested in this method of popular education.

ILLUSTRATED magazines and papers continue to increase, and there is now an announcement of *The Illustrated Naval and Military Magazine*, a new monthly periodical to make its appearance on the 1st of next month, "to be devoted to all subjects connected with Her Majesty's Sea and Land Forces," for which the services of Messrs. Linley Sambourne,

R. Caton Woodville, W. H. Overend, Rudolf Blind, and others, are engaged for the illustrative department. That promises well for the pictorial side of the illustrations, but we would suggest that there are many topics connected with naval and military operations which need illustration of a more practical than pictorial kind, and we hope this side of the matter will not be lost sight of entirely, in favour of mere pictorial effect.

THERE seems to be some confusion and cross-purpose in regard to the claims of "the cyclists" for admission into the parks, and also in regard to the rights and reasons of the whole question. The cyclists, by their deputation to the First Commissioner, asked for admission to Regent's Park, Battersea Park, and Victoria Park, for purposes of "traffic," not of "exercise," and obtained their request; but a member of the National Cyclists Union writes since then to the papers to say that they limited their request to what they thought they could at present obtain, and that "it was only from fear of rebuff that all the parks, and especially Richmond Park, were not included in their request." It appears to us that it will be impossible practically to distinguish between "traffic" and "exercise," unless special constables on bicycles are kept to dog the wheels of the cyclist, and see that, having entered at one gate, he goes straight out at the opposite one: without this the restriction will practically be a dead letter. As to the sense of the exclusion of cyclists from parks, it seems to us only to apply with force to the case of Hyde Park, which is the fashionable drive, and is overcrowded in the season, without adding "cycles" to the total; and, moreover, bicycles are unquestionably awkward animals in a crowd, as they will not stand still or proceed at less than a certain minimum pace without losing their balance; being in this respect more unmanageable than the majority of riding-horses. But apart from the case of a crowd, cycles are hardly a danger in the neighbourhood of London now; horses have got pretty well used to them; and no one can pretend that they are unsightly; therefore we can see no reason why they should not be admitted into Richmond Park, when there is no crowded traffic. Hyde Park is an exceptional case; but with that exception it seems to us they may very well have the run of the parks, and no one be any the worse for it.

WE are to have, it appears, more of the Charing-cross Railway Bridge. A little of modern engineering architecture goes a long way in despoiling a river, and as no possible additions could well make Charing-cross Viaduct more hideous than it is at present, the addition is little more than a question of quantity,—so many more yards width of ugliness. The Metropolitan Board of Works are, however, to be commended by patriotic persons for the stand they made against the addition, and for the check they have procured against the absolute indifference of the South-Eastern Company as to anything which may spoil the Thames Embankment. At present the portions of the Embankment adjoining the viaduct are planned symmetrically on either side of it, so as to present an idea of fitness and pre-arrangement in the connexion of the Embankment and the viaduct. The Board of Works have, at all events, secured a provision that the Railway Company shall defray the cost of altering the Embankment so as to fit symmetrically with the new state of things when the addition to the Viaduct is made. We are obliged to be thankful for very small mercies nowadays, in regard to the spoiling of London sites by railway enterprise, and we are thankful accordingly for this one, and praise the Metropolitan Board of Works,—which we cannot always do.

The Royal Colonial Institute.—Messrs. Archibald Smith & Stevens, of Janus Works, Queen's-road, Battersea, have been intrusted with an order for one of "Stevens & Major's" patent suspended hydraulic passenger lifts for the Royal Colonial Institute, Northumberland-avenue.

SCULPTURE AT THE ROYAL ACADEMY.

AS we before observed, sculpture at the Academy is stronger this year than usual, and some, at least, of its strength is in the right direction,—that of the embodiment of ideal and poetic subjects, either of history or legend, or of pure imagination. Of course there are not really many of such works, but speaking relatively, they are more numerous than usual, and may be regarded as forming a class by themselves to be considered separately. Mr. Birch's "Godiva" we have already spoken of when we published our illustration of it, and need only refer now to what we observed in regard to it then (p. 640, *ante*). Among the works of a purely ideal class, one of the finest and most original is the bronze figure in the Octagon, entitled "L'Age d'Airain" (1867), by M. Rodin, whose fine study for a figure of John the Baptist was one of the few things worth looking at in the exhibition of the French "irreconcilable" artists at the Dudley Gallery last year. It is the nude figure of a thin, spare man, in an attitude as if almost too fatigued to stand, and with one hand placed wearily up to his head; the whole figure is most pathetically expressive of the stress and strain of labour, and its result on the human character. It would have been more realistically complete if the sculptor had shown the limbs somewhat distorted from their best proportion by the overstrain on certain muscles to the exclusion of others, which is the case with most men who are engaged in laborious and unchanging toil; but this would have been, perhaps, an error from a sculptural point of view. As it is, the work is a remarkably fine one, when once its intention is grasped; a matter, however, which we fear few of our ordinary Royal Academy visitors trouble themselves about; nor, indeed, do English sculptors often give them a problem of this sort to work out. The other ideal work in the Octagon, which may be grouped with this, is Mr. Onslow Ford's "Linnæus: the Personification of a Dirge of Lamentation" (1880), a male figure walking along with face upturned and carrying an inverted torch. This, though less thoughtful and less strikingly original than the previously named work, is a fine and expressive figure, and a worthy contribution to the short list of works, fulfilling what we take to be the real, or at least, the highest objects of sculpture. Among other works of similar class may be named Mr. Swinerton's "The Victor" (1876), a figure of a man with a sword in his hand gazing rather (as it seems to us) contemptuously on the wreath which he holds in the other hand, as if he were appraising it in the business way in which Swift summed up the expenses of a Roman triumph,—"a crown of laurel: 3*d*." The figure is not remarkable in any way. Mr. Milo Griffith's "Slinger" (1871) is another male figure very carefully modelled and with much realistic detail of muscle, but the chest seems formed on the lines of Greek conventionalism, while all the rest is realistic: the figure is only partially a success, it wants animation, and does not seem in earnest; the slinger handles his materials very gingerly, and as if not quite sure if he could make up his mind to use them. Mr. Pinker's "Britannia" (1869), backed by a lion very large at one end and very small at the other, is a somewhat stiffly posed and heavy lady, and does not succeed in exalting our ideas of Britannia.

Facing the main entrance, on the opposite side of the octagon, is Mr. Mullins's terra-cotta group of Isaac and Esau, "Bless me, even me also, O my father" (1882); the most important work Mr. Mullins has produced, and occupying a more central and leading position than he has before occupied in the Academy exhibitions. The group deserves its place. It is, for one thing, exceedingly well composed; the figure of Isaac, half raising himself in a sitting posture, is met by the half-crouching suppliant figure of Esau; the lines of the two figures blend into one mass, sloping away towards the feet of the two figures in a manner that appears natural, though evidently carefully studied; the pose and expression of the aged patriarch are very dignified and pathetic; the character of the hands has been carefully studied. We shall give an illustration of this work shortly. Among other things to be mentioned in the octagon-room is Herr Schooja's life-sized group, "Rescued from the Deep" (1894), which has great merits of composition and modelling, but wants the power of realisation; the

man, who is supposed to be dragging up a mother and her child from the sea, is not really exerting himself, and is in an attitude more favourable to the production of graceful lines than to the exertion of muscular force; the woman rescued does not seem to have suffered much, and is in a stage attitude very different from what we might expect in a figure dragged up, half-drowned and terrified, from a watery grave. In short, this is a stage group, with merits which lie on the surface only. Signor Lucchesi's figure of "A Waif" (1,681), a poor little vagabond boy, is very pathetic and expressive in the thin, worn, and wistful face; the rest of the figure seems hardly in proportion with the head, and the hands are not those of a "waif." The two colossal portrait statues, Mr. Bruce Joy's "Lord Frederick Cavendish" and Mr. Brock's "Sir Richard Temple," lose, as all such works must, from their confined position; both have strongly-marked personal character, of a sufficiently opposite description. Mr. Adams-Acton's bust of Cardinal Manning (1,689) is a fine one, and Mr. Bruce Joy's "Mr. Gladstone" and "Miss Mary Anderson" (1,691-2) are admirable likenesses. Mr. Amendola's "Rose among the Roses," a head and bust of a female figure rising from a mass of roses (unsuitable things to carve in marble) cannot be passed over, but its cleverness is not of a high order; the head is a poor and sensual one; there is a flavour of vulgarity about the work. Mr. Armstead's pretty and fanciful little figure entitled "Egypt" (1,688) should not be overlooked.

In the Lecture-room Mr. Alfred Gilbert's small figure "Icarus" (1855) attracts the notice of all who can appreciate delicate fancy, and originality in pose and conception. The "Icarus" is an elegant but weak youth, and seems already to feel the wings too much for him; the sculptor has very cleverly endeavoured to give some degree of mechanical possibility to the method of attracting and using the wings. The figure is, it must be admitted, a kind of reproduction of the sculpture of the Renaissance, in feeling and manner, though not of any special work. Mr. Gilbert's head of an old man in bronze (1,699), is a clever but disagreeable piece of realism. Mr. Woolner's alto-relief, "The Water Lily" (1,700), is a charming little work, which we illustrated a few weeks since. Among the ideal bronze heads which are becoming, we are glad to say, rather a fashion,—it is a fashion quite on the right lines of sculptor's work,—is an interesting and expressive one by Mr. G. W. Kinloch, entitled "After Labour, Rest" (1,743). A more powerful and very imaginative head in relief, in bronze, is Mr. H. Bates's "Orpheus" (1,804), which should not be passed over. Among the larger works Mr. Thornycroft's "Mower," which we illustrate in this number, is a fine example of treatment of a subject of everyday life in sculpture. The attitude is admirably easy and natural. Whether it is a subject to be treated in sculpture on that scale is another question.

As a study in plaster or terra-cotta such a work is a highly interesting experiment, but would there not be a sense of unfitness if it were translated into marble? We are disposed to think so. It is a subject rather for treatment on a small scale, as a sculptor's sketch: on a large scale it hardly seems worthy of the dignity of the art, though its expressive character and unaffected simplicity have secured it, and deservedly, much admiration. Mr. Lawson's "Retiarius" we have already illustrated and commented upon. Mr. Calder Marshall's "Psyche," a recumbent figure supposed to have fainted, is finely modelled, but not very original; one can hardly accept it as an ideal of Psyche. The same sculptor's "Youth" we have already mentioned. The Lecture-room contains three Academy school designs for the subject of Socrates teaching or arguing in the Agora, by Messrs. H. Bates, H. A. Pegram, and G. J. Frampton respectively (1,712, 1,738, 1,799), of which the first in order of hanging is certainly the best; one or two of the figures seem rather closely adapted from Flaxman, than whom, however, there could not be a finer or more wholesome model for young sculptors. The fourth place on the wall, corresponding to those occupied by these works, is filled by a design in relief by Mr. Adams-Acton, a portrait group of boys, with rabbits, rabbit-hutch, and all complete, which we see with pain. Is it intended to carry out this in marble? Anything more decidedly unsatisfactory could hardly be.

Among the bust-portraits is an admirable likeness of Mr. Herbert Spencer, by Mr. Boehm (1,784), and the model of Mr. Brock's massive-looking bust of Longfellow now in the Abbey. Mr. Boehm exhibits also a very successful bust of Lord Wolseley (1,722), and Mr. Belt one of Lord Shaftesbury (1,703), of which we will only say that it is a pointed comment on recent events: it certainly has not been "invested with artistic merit." Mr. Fry's bust of Mr. Norman Shaw (1,727) is a good one, so is Mr. Pinker's Professor Rolleston (1,730), notable for the bold way in which the marble is treated, with the tool-marks almost visible on it, and no "effete" fining down. Mr. Birch's Mr. Wilson Barrett (1,773) may be noted, as also Count Gleichen's pretty and refined portrait of a lady (1785), a bust rising from between two wings. Among the smaller works, a design for a salver, in low relief, by Mr. Mark Rogers, jun. (1843), is very good. Miss Alice Chaplin's "Kassasreen" (1739), an equestrian group, is full of spirit, so is her "Bird in the Hand" (1,829), in the claw, rather, of a cat; and Miss Hannah Barlow's "Orpheus" (1,812), a group of lambs, and her little relief subject, "The Sick Lamb" (1,828), are instinct with truth and life.

Further examination of the sculpture bears out what we have implied before, that it is the most successful and interesting portion of this year's exhibition; and it is a good many years since that could be said.

THE THROTTLE-VALVE OF THE MERSEY.

The opinions of Sir W. Forwood (p. 871, ante), as to the advantage of the constant changes now effected, at each spring tide, in the channel through the sandy estuary of the Mersey, should be compared with the valuable paper "On the Changes in the Tidal Portion of the River Mersey and in its Estuary," by J. N. Shoolbred, M.Inst. C.E., which, together with a report on the discussion of the same, is to be found in vol. xlv. of the Proceedings of the Institution of Civil Engineers, illustrated by five plates, giving charts, sections, and tidal lines of the river. Papers abstracted from foreign periodicals "On the Currents in Navigable Rivers," on the Cavour Canal, and on floods on the Danube, the Theiss, the Durance, and the Seine, are contained in the same volume; as well as a paper by Mr. W. H. Wheeler, M.Inst. C.E., "On Fascine Work at the Outfall of the Fen Rivers, and Reclamation of the Foreshore," and a report of the discussion on the subject. Admiral George Evans, at that date (1876) Acting Conservator of the River Mersey, and several members of the Institution, of large experience in hydraulic works, took part in the debates; and the changes in the channel from 1820 to 1871 were shown on the drawings, and numerically stated, in cubic yards, in accompanying tables. The theory advanced by Sir W. Forwood to the effect that what he calls the "wriggling about of the channel" of the Mersey above Garston "prevents accretion," and maintains the tidal capacity of the channel, found no advocate at this council of experts. On the contrary, Mr. Brooks said that "engineers should not be thwarted in their efforts to improve rivers by the crude theories of those who, without practical knowledge, forbade all interference with them, and laid down laws in regard to river improvement and conservation. The cause," he said, "of the present bad condition of the river was the state of the inner part of the navigation, there being a mass of shoals above the pool, instead of a properly confined channel. When river works were carried out judiciously, there was a much more powerful tidal column running up the river, and there was no such obstruction as that now existing on the bar. Notwithstanding the large volume of water from the backwater of the Mersey and its tributaries, due to the drainage of the country, the harbour was inferior to that of the Dart, in that the latter had eight fathoms depth of water at its mouth at Dartmouth, and it was even inferior to the little river Medina between East and West Cores, where the depth of water on the bar was 11 ft. at low water of spring tides."

As at the date of the discussion in question there was no idea entertained of an improved water communication between Liverpool and Manchester, the general accord of the speakers has much greater weight than almost any state-

ments that may now be made on the subject, inasmuch as it is free from any charge of either conscious or unconscious advocacy. A Bill was at that time in Parliament for the appointment of a Commission to represent the various interests connected with the navigation of the Mersey. It is noteworthy that Mr. Leader Williams, then, we believe, engineer to the Bridgewater Canal, said that "the large middle portion of the Mersey, when the river widened out to a great extent, was in such a state that it was impossible to expect a good navigation. By confining the ebb and flow of the tide always in one direction the same results might be expected as had followed in the case of other rivers." Mr. Giles said "there were many examples of rivers having been regulated and narrowed by banks nearly parallel, that had increased the flow and thereby deepened the channel." Mr. Redman showed that the volume of water passing Liverpool was somewhat less than the volume of the Thames above Sheerness, and that while in that river the difference of high-water level between Sheerness and London Bridge, a distance of forty-three miles, was 3 ft. 8 in.; the difference between Liverpool and Runcorn, a distance of twenty-five miles, was 4 ft. The beneficial results which had followed the training of the Ouse, the Nene, and the Witham, by fascine banks, were mentioned by Mr. Wheeler, Mr. Brooks, and Sir John Coode; and, in a word, the general consensus of professional opinion was wholly opposed to the theory now ventured by Sir W. Forwood.

The promoters of the Ship Canal were advised, in 1882, that no design would be complete which did not secure a deep-water channel through the estuary to the five-fathom line to the north-west of Formby Point; and that the question of giving stability to the edge of the Great Burbo bank, by kidwork or training, was a part of the general problem. Had this advice been followed the great cost of the unsuccessful Parliamentary application of 1883 would have been avoided, and even the present condition of the promoters of the Canal might have been materially improved. If the statement of our correspondent that the bar of the Mersey has shoaled 4 ft. in seventeen years be accurate, it is evident that, whether freely or reluctantly, the advice above cited must ultimately be followed, and that in the interest not of the upper Mersey ports alone, but also of Liverpool itself.

DETAILS OF TOMB OF FILIPPO DECIO.

This is the sheet of details, to larger scale, from Mr. Oakeshott's drawings of this fine monument, which, as we mentioned last week, gained for their author the Travelling Studentship of the Architectural Association. A peculiarity of the foliage in the upper portion is the number of little black dots of shadow caused by the small but deep circular cuts in the inner angles of the leaf-lobes, and even, in places, drilled through the leaves themselves. This is more apparent in the actual work than in the drawing here given, which, however, is otherwise a most faithful representation.

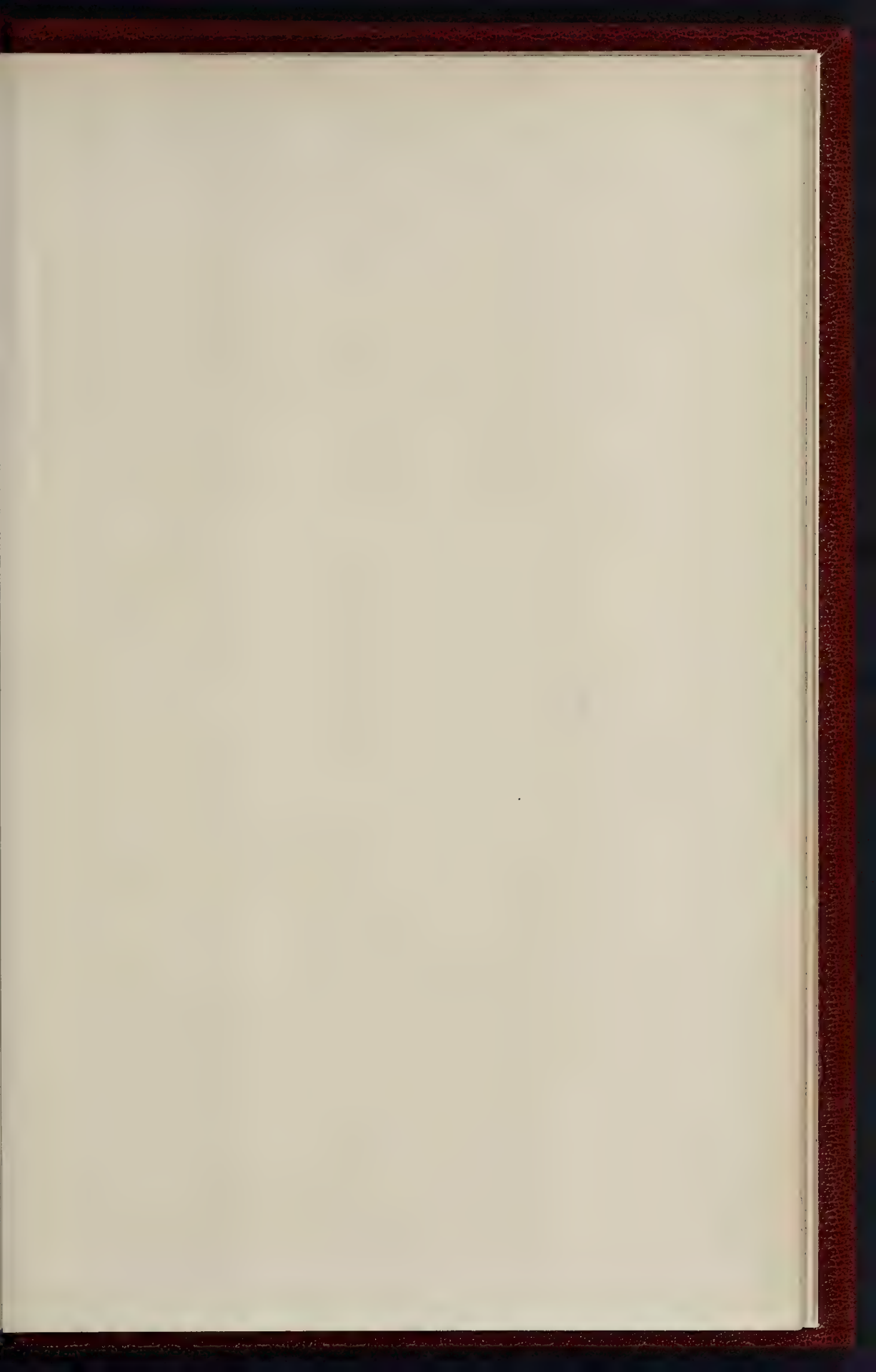
SCULPTURE AT THE ROYAL ACADEMY. NO. 6.—"THE MOWER."

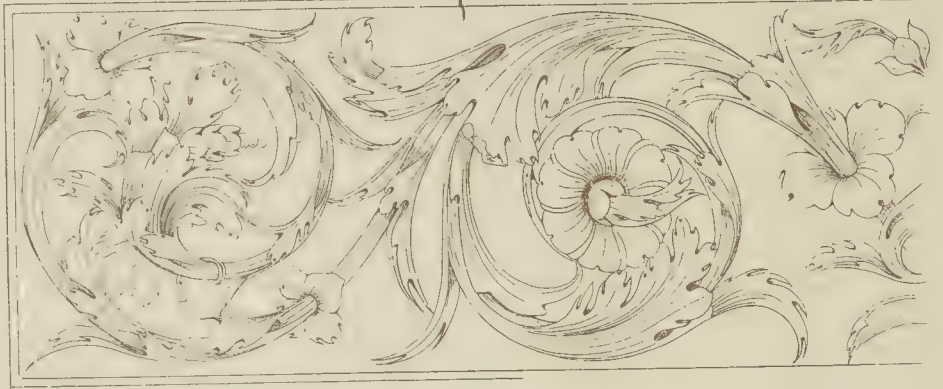
BY MR. HAMO THORNYCROFT, A.R.A.

We have referred, in some general remarks on the sculpture of the year, in another column, to this fine example of the treatment of a subject from everyday life in sculpture. The figure stands conspicuously in the lecture-room as a kind of pendant or parallel to Mr. Lawson's "Retiarius."

HOUSE, LYNDBURST.

The very picturesque-looking house of which we give a view was built for Mr. Maxwell as a hunting-lodge, from the designs of Mr. F. S. Brewer, architect, of Richmond. It exhibits great variety of outline, and a certain degree of rustic character just sufficient to assimilate it to its position and surroundings, without sinking the character of a gentleman's house. The proprietor, we understand, is as well satisfied with the practical arrangements and comfort of the house, and its adaptation to its purpose, as with its pictorial effect. It may interest some readers to know that the lady of the house is the brilliant authoress whose maiden name, Miss Braddon, is so well known on the title-pages of many a popular and successful novel.



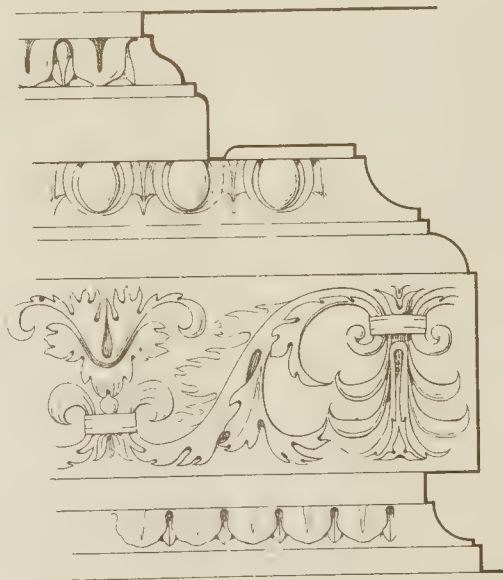


Part of Panel on level with Trusses

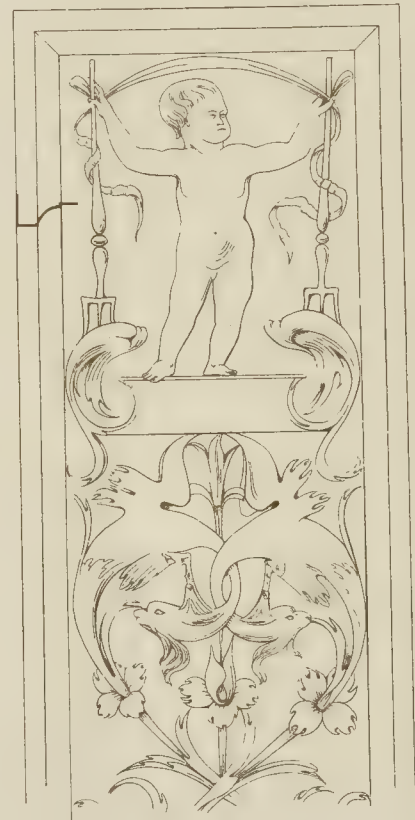
CAMPUS SANTO PISA

Temple of Filippo Detti — Details

(For General Drawing, see last Week's Number.)



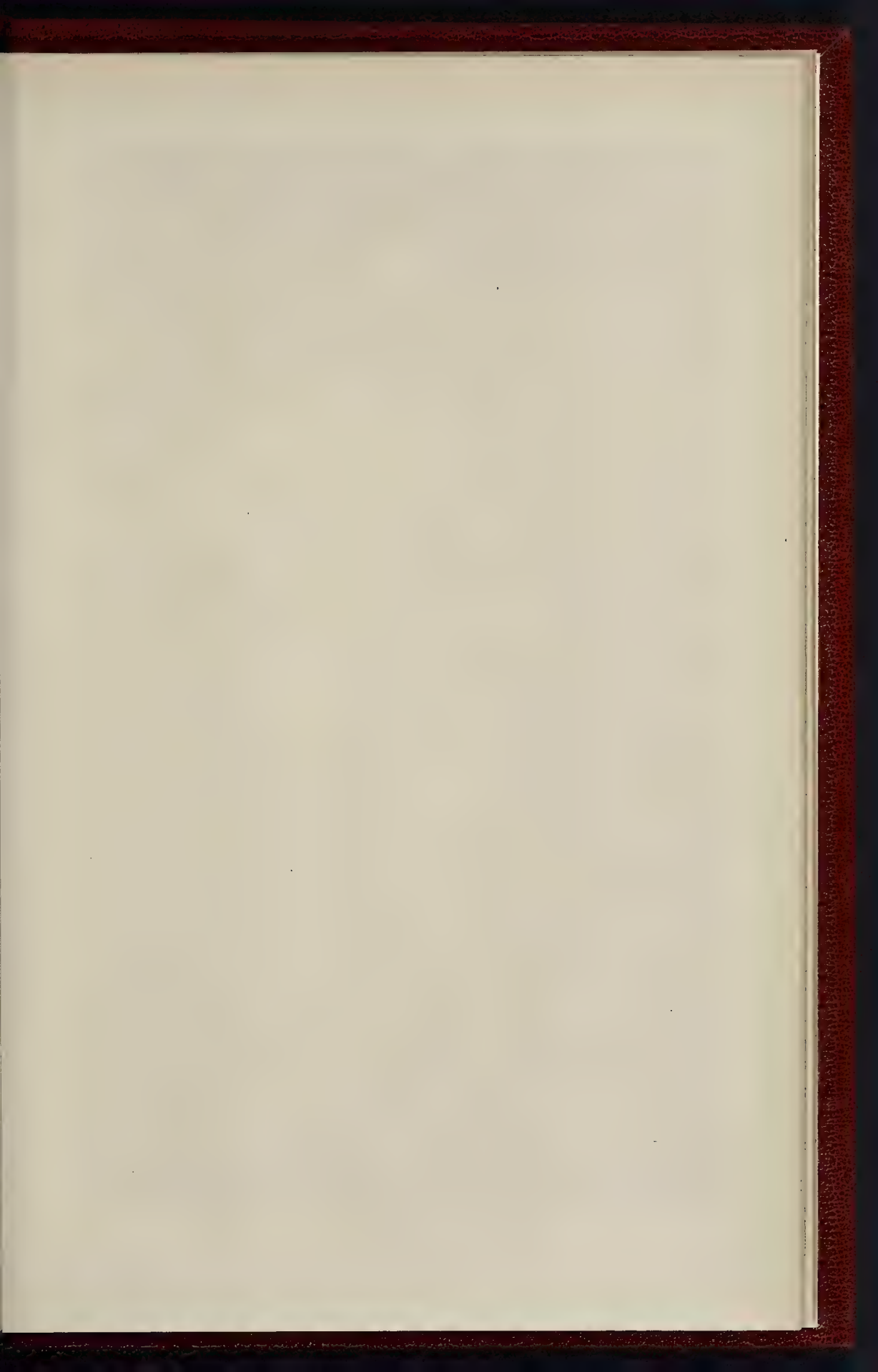
Column



Part of Left Front Panel

Geo. H. ...

Described in "The Builder"



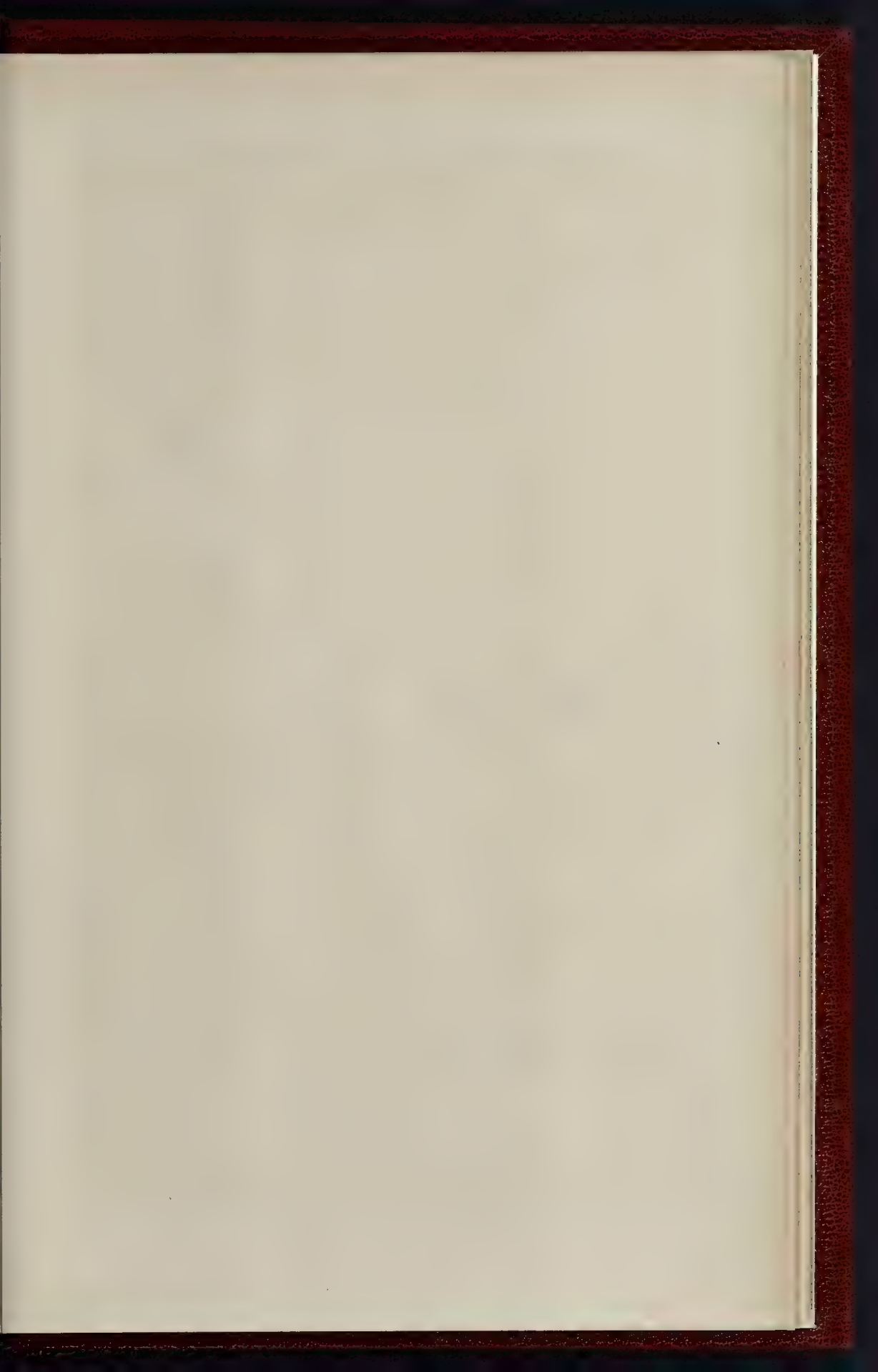


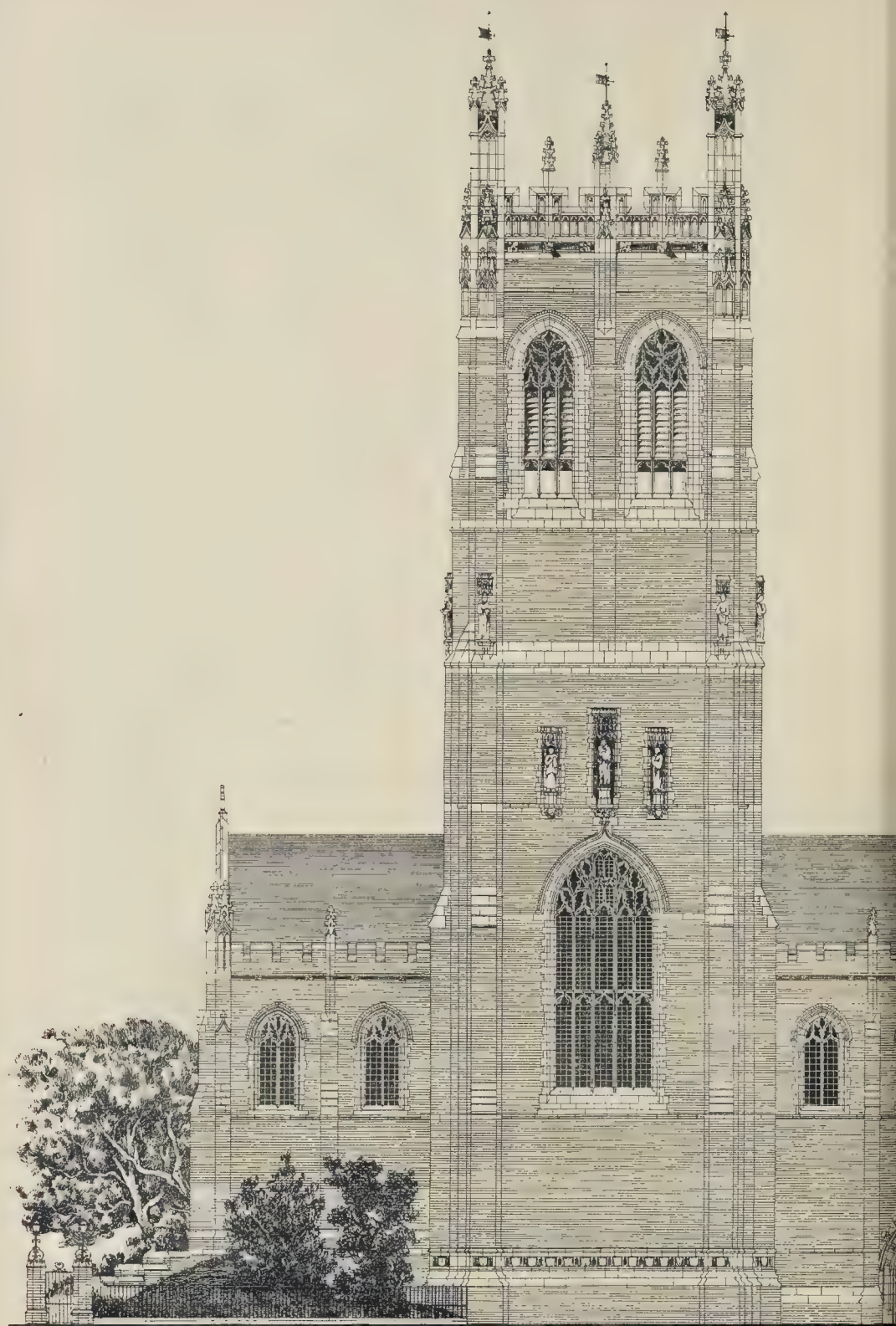
THE PHOTO, SPRAGUE & CO. LONDON

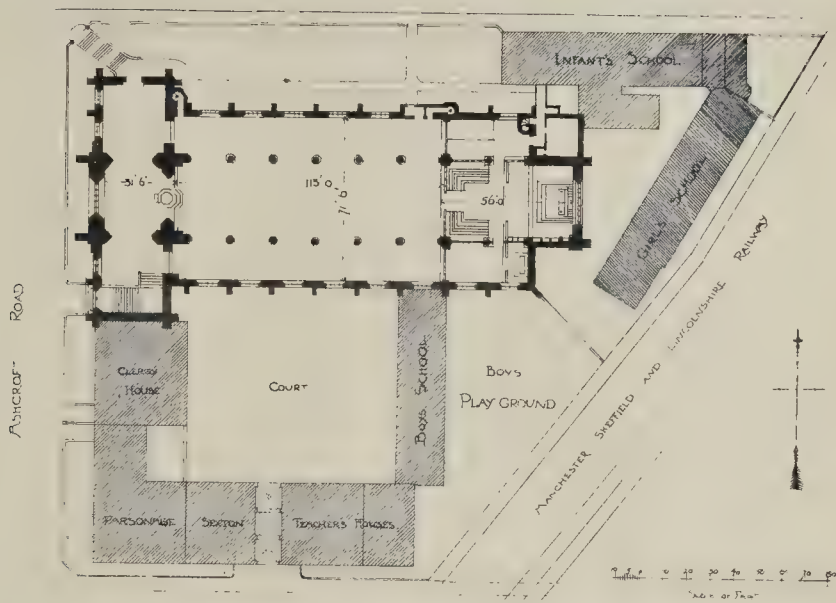
SCULPTURE AT THE ROYAL ACADEMY.

No. 6.—"THE MOWER."

By Mr. Wm. HAMO THORNYCROFT, A.R.A.







CHURCH OF ST JOHN THE DIVINE, GAINSBOROUGH

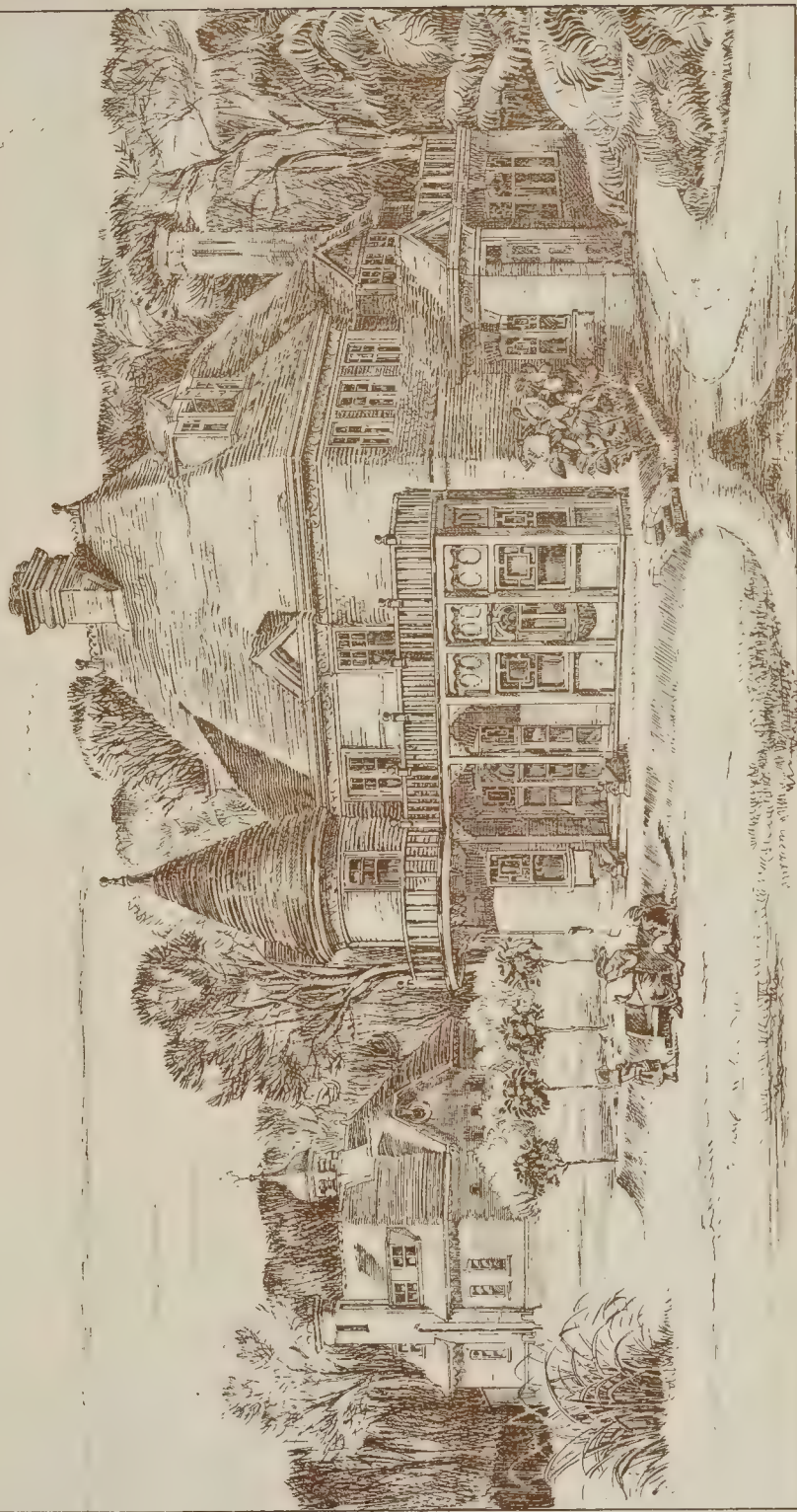
Mr Somers Clarke Junr } Architects
and Mr J T Micklethwaite }
15 Deans Yard Westminster





INK PHOTO SPRAGUE & CO LONDON

NEWEL OF THE GRAND STAIRCASE, CHATEAU DE BLOIS.



HOUSE, LYNDHURST: FOR MR. MAXWELL.—MR. F. S. BREWER, ARCHT.

CHURCH OF ST. JOHN THE DIVINE,
GAINSBOROUGH.

This church was begun in the year 1881, to provide for the rapid increase of population in the town of Gainsborough, the chief business of which is concentrated in the production of agricultural implements at the works of Messrs. Marshall & Co.

The portion of the building already constructed consists of the sanctuary, chancel, and three bays of the nave, the whole carried up to the level of the internal string under the clerestory windows, 33 ft. 9 in. from the nave floor. A hollow brick wall has been built against the outside faces of the octagonal columns, each bay pierced with a group of three lancets, and the building as now used forms an aisled church, showing the main columns and arcades of the finished work on the inside.

The site slopes towards the west; the floor of the nave is, at this end, 10 ft. above the street level.

The walls are constructed of red brick, with dressings, &c., of Ancaster stone. The interior intermediate surfaces are all plastered.

The chancel floor is paved with a chequer of Ancaster stone and slate.

A small organ of ten stops, by Lewis, is erected in a temporary transeptal building projecting from the eastern arch of the chancel on the south side. The temporary vestries are below.

Mr. Wm. Johnson, of Doncaster, was the builder of the church as yet erected. The architects are Mr. Somers Clark and Mr. J. T. Micklethwaite, of 15, Dean's yard, Westminster.

NEWEL OF GRAND STAIRCASE,
CHÂTEAU DE BLOIS.

We give the view of this well-known and remarkably effective piece of Early French Renaissance detail, partly as a comment on the mention of the visit of the members of the French Congress of Architects to Blois (see in another column), partly for its own sake and inasmuch as a thing of beauty is a joy for ever. It is a remarkable example of the union of what is essentially, in some respects, Gothic feeling, with some of the more graceful and chaste detail of Early Renaissance.

MR. DU MAURIER'S DRAWINGS.

The great public which Mr. Du Maurier delights would be hard set to give reasons for the faith that is in them. "His women are all alike," "his crowded drawing-rooms are always the same," "his jokes are so very long," are remarks we have heard again and again. If we examine this matter at all closely we find, of course, that his women and his drawing-rooms are not always the same, and that his "jokes"—though, in fact, he is seldom jocose and never witty,—are often short and full of point. Two sufficient reasons for his popularity can be found: he is a keen and very careful satirist; and, secondly, an excellent draughtsman. The English people have a pure fondness for satire, as such, which is disheartening to those who desire their improvement; and they delight in reality. We are not educated to a Gallic appreciation of the "value" as distinguished from the facts of nature. Something we have seen once, and want to see again, is the most we demand of the painter. When the critic of the future shall have made a final analysis of æsthetic pleasure, we shall find that the mere faculty of recognition is at the root of it all, and that the simple delighted expression, "That's our Jim!" has in it the essence of all pleasure in art from that of the modest peasant to that of a Maude or a Postlethwaite. Du Maurier satisfies to the full this English craving for reality. He has no exuberant humour to urge caricature; he is not driven into it, as many are, to conceal the weakness of his drawing. His subjects are straight from the life, and it is remarkable how many are the types of mind he has probed, of body he has portrayed with a wonderful fidelity. Like Homer, John Tenniel, Mr. Millais, and some more, Du Maurier may be caught nodding at his work. Sometimes, it must be confessed, his group seems very tame, and his joke too long for human endurance; but these slight lapses must not be grudged to a man who, for twenty-

four years, has been *Punch's* most constant contributor.

Mr. Henry James, in the interesting essay which he has prefixed to the catalogue, shows himself an ardent and very discriminating admirer. The body of the catalogue has an interest which is lacking in general to such compilations, it being, in fact, a complete collection of those letterpress illustrations which properly belong to the drawings, and which already we have read in our *Punch*. There the imbecilities of Maude are all enshrined; and the "things one would rather not have said" are collected by way of warning. To speak of these drawings in detail is hardly possible. They are upon a scale larger than that on which they appear in *Punch*, and they appear to us to exhibit very great variety in point of quality. Often, and this is the case particularly with his women, there is a charm of touch about the hair, eyelids, and lips which is lost in the engraving. In *Punch* we are apt to become ungrateful, and to be tired of these graceful women who seem always the same. Of the women of Du Maurier's own drawing it is hard to tire. No more beautiful example of his work could be shown than in the head of the American girl of 227. And no more sharply-pointed rejoinder than hers could be easily found. *Snobley*: "Aw—aw—it must be very unpleasant for you Americans to be governed by People—aw—whom you wouldn't ask to dinner!" *American Belle*: "Well—not more so, perhaps, than for you in England to be governed by People who wouldn't ask you to dinner!" The list of characters which Du Maurier can conjure up to the vision at will is a very long one. Every nuance in the gradations of English society he can unmistakably express. He knows and can draw the social difference between Bayswater and Kensington; the difference between a puppy and a snob, and between a cad and these two. None ever drew better the genuine English aristocratic. With the clergy he is not less at home. His studies of Frenchmen (as of French on the British tongue) are ever delightful. There is one ground upon which his drawings are occasionally displeasing to us. Mr. Du Maurier has a special sense of beauty, which is shown as well in the composition of his drawings as in the actual grace of his physical types. He has also a very special perception of ugliness, and in the portrayal of it, when, as we have said, he is napping, and his humour is not at its best, the sheer physical ugliness is sometimes obtained in a manner which is distressing and offensive, because we cannot find its presence to be essential to the exhibition of any moral idea. That he is nearly infallibly true to nature we admit, but it does not affect our charge. The satirist, no less than the graver artist, must always be prepared to justify the selection which he makes from the unselected profusion of Nature. Unredeemed physical ugliness cannot, in itself, be any subject for satire; it is certainly no subject for art. It is pleasant to think that one of our favourite makers of fun can be also a very serious artist at will, and be the possessor, moreover, of a literary faculty which might be envied by many. "Der Tod als Freund," which appeared in the *New Illustrated*, is a pathetic and noble design, and the verses "from the French" which accompany it, would do credit to any translator.

RECENT ARCHITECTURAL PROGRESS
AT VIENNA.

We mentioned last week the paper read on this subject at the Congress of French architects, by M. Paul Sedille; we give now the following remarks extracted from it, with the author's permission:—

"It is in the new streets that we can study to most advantage the great recent architectural effort of Vienna. With that object, we must traverse the extensive districts which border the 'Ring.' Cut up with roads parallel and at right angles to each other, they have offered to the architects sites of a symmetrical and regular shape which contribute singularly to the monumental effect of these islands of constructions. To add to the effect of the *ensemble*, the building owners, individuals, or companies, have not unfrequently combined various estates in one sole construction, combining within its lines various courts and separate dwellings; it is, therefore, not uncommon to see façades presenting ranks of nearly thirty widely-spaced windows.

The permitted height being something over 24 metres (13 klafters in Viennese measure) to the upper line of the main cornice, without counting the attics, roof pavilions, or other decorative features surmounting the cornice, one can imagine the size of the architectural masses that are produced. Nevertheless, these vast surfaces of building are enlivened by plenty of bold projections. The maximum limit for projection is 1.26 metre, and in order to form a porch or *avant-corps* on to public land, it is only necessary to pay the rent of the space occupied. Thus, then, while at Paris the maximum projection for balconies is 80 metres, and that for cornices 50, with uniform limits of height enclosed within a rigidly circumscribing line, at Vienna the architect can use considerable projections, and give life to his façades by advanced masses, detached columns, large balconies, or small chambers corbelled out; and further, above his cornice limit of 24.70 metres, he can *silhouette* his façades by pavilions raised upon them, pediments and accented gables, turrets, cupolas, roofs of all kinds with no special limit imposed beyond the block of the main edifice, and thus contribute to the beauty of his own building and the interest and variety of the street architecture in general; the only restriction being that rooms for ordinary habitation are not to be built above the line of 24.70 metres.

The building regulations themselves conduce to the maintenance of a large and monumental style of building. Only five stories may be built within the above-mentioned limits of height; and as every window must have a certain height above the floor, the floors themselves being very thick, being formed according to Vienna usage of heavy timber beams, a considerable height between each tier of windows is a necessary result, leaving a space very suitable for decoration.

The ground story partakes of the generally massive character of the buildings. The upper portions of the buildings do not seem, as in Paris and London, to be hung in the air above a void, where even the meagre support afforded by iron columns is disguised as much as possible. At Vienna the tradesmen seem to accommodate themselves very well to the subdivision of their windows by the piers corresponding to the architectural divisions above. Nor do they indulge in the vanity of windows down to the pavement, cutting all the visible basement in every direction. This fashion may come in, perhaps, judging from one or two attempts in that direction in certain very commercial quarters of the town; but, at all events, the properties in the vicinity of the Ring-strasse have escaped that barbarism and stand firmly on their piers.

Such is the general character of the exteriors of the buildings we are speaking of: a lofty ground-story forming a solid base to the whole, and accentuated by projecting masses, often disposed arcade fashion and marking plainly the point of support of the building. Above, four stages, an entresol, then a lofty and richly treated story, then another intermediate one, and a *quatrième* treated somewhat as an attic or dwarf story, and grouping with the cornice-design which crowns the main building. The winter climate being severe at Vienna (which explains the use of double casements everywhere) openings are not needlessly multiplied in the façades, in which the solids surpass the extent of the voids, contrary to the custom in our overlighted houses, where we boil in summer and freeze in winter.

The Viennese house, then, offers naturally a great surface for the decorator. The architect profits by this. The monumental-looking portals with double columns and sculptures and rich cornices; the columned windows, with Caryatides and pediments, the other stages adorned with friezes and decorations of all kinds, often with paintings on a gold ground; the balconies carried by columns or winged figures; the entablatures with many consoles and crowned with balustrades and statues, are the usual motifs of that architecture. Add to these the square or circular angle pavilions dominating the lateral wings, and above all the overhanging chambers (*loges en saillie*) on the façades,—which, isolated or superposed in stories, are at once a great interior convenience, and a source of charming exterior effect,—and you will have some idea of the appearance of these vast habitations, suggesting reminiscences of the Italian palaces of the Renaissance, which, on a first view, strike the visitor with astonishment. He asks with

reason how such decorative profusion has been possible in a pecuniary point of view, and if the individuals or companies who own these buildings have not the usual eye to the interests of the pocket. Well! one must in the first instance render that justice to the building owners and builders to say that, animated by a very honourable sentiment of patriotism, and further stimulated by competition in their efforts, they have endeavoured to act on a grand scale, and to do their part towards the embellishment of that new city, of which every Viennese has a right to be proud. But there is another side, a reverse to the medal, a weak side of all this outward beauty. Let us explain.

Free-stone, hard or soft, sandstone, granite, marble, are materials very costly in Vienna. Nevertheless, these materials are existent not many leagues from Vienna, in the spurs of the Alps, or further in the mountains of Tyrol; but the quarries are for the most part monopolised by wealthy companies, who keep up forced prices. On the other hand, at the very gates of the city, there are immense banks of clay which furnish, after burning, excellent materials at little cost. Hence the employment at Vienna, from time immemorial, of bricks and tiles for the construction and roofing of both public and private buildings. It follows that there is still the most habitual and economical construction at Vienna. Stone and other durable materials are only employed exceptionally, in small quantities, by necessity, or as luxuries. Thus, then, all those vast constructions which affect the air of being palaces, are only in reality brick covered with cement. It is cement which forms every member of the architecture; and all the figures so often repeated are no more than mere *moulages* in terra-cotta joined to the brick base. Thence comes this lavish use or abuse of decoration. Thence the colonnades, atlantes, caryatides, figures of children in long file, produced and repeated till they almost weary the eye, and lose much of their value. Those far-projecting cornices and massive consoles are often only thin stamped zinc covering the nakedness of the beams which form the construction. The decorative paintings on a gold ground, before referred to, fade in a few years, as much as the reliefs in cement, under a climate little favourable to their duration.

We are at this moment too much the partisans of truthful architecture, of that which accentuates the materials which it employs, and which derives from the character of those materials its best expression, not to deplore these deceitful charms which, after examination, lose their effect. Architecture is not the decoration of a day made for momentary pomp and parade. One must have the assurance, in contemplating it, that this effect is durable, and, above all, that the forms and the decoration are the consequence of the characteristics of the various materials, and are not other than what they seem. There is nothing of the kind here. There are not the materials which imply this decoration, it does not appear to me indissolubly bound to the edifice, and, therefore, it interests me only as a kind of chimera, a piece of flattery of the eye decoration which I can in a moment modify by my own will, or suppress altogether.

Why have not the builders of these ambitious habitations made it their business to construct frankly in obvious brick, reserving the scarce and costly stone for certain necessary points in the construction, or for special *motifs* of decoration, when they would have had the more value the less they were multiplied? Great buildings would not in that way have lost their monumental aspect. On the contrary, they would have gained by this sobriety and amplitude and style, which they lose now through the abuse of an ornamentation vulgarised by constant repetition.

Another reproach against these handsome houses is that, behind their rich decoration, there is very little. Plan hardly exists. There are none of those niceties of distribution which render life so easy and comfortable in our Parisian interiors. Little care is given to accessory details. The apartment house is a *suite* delivered over, bare of everything, to the tenant; it is for him to make an interior of it according to his fashions and his tastes."

The Exeter Town Council have decided to place the work of renovation of the ancient paintings in their venerable Guildhall into the hands of Messrs. Haines & Sons, of 25, Fulham-road, S.W.

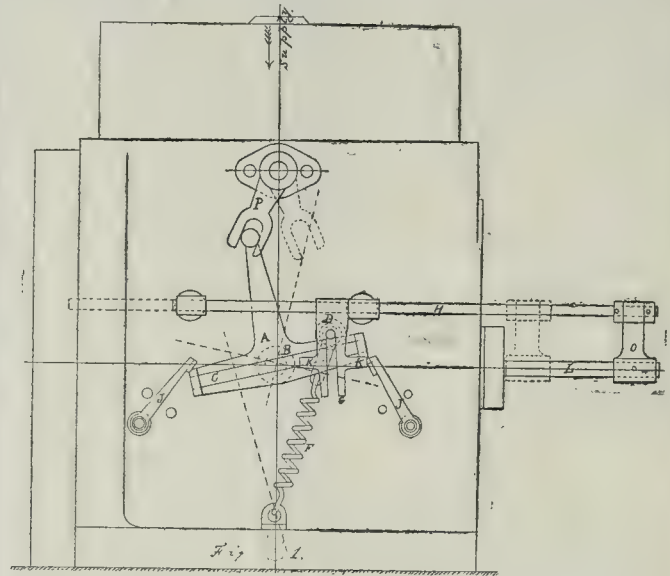
A HIGH-PRESSURE WATER-METER. H. W. PENDREED'S PATENT.

This meter consists of a cylinder and piston, and is provided with a slide valve to direct the flow of the water alternately to either side of the piston; the valve may be balanced if necessary, to prevent any friction that might arise from pressure upon it.

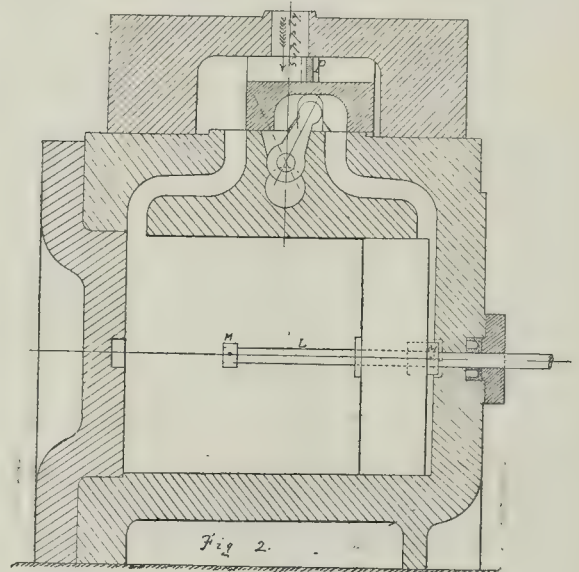
Referring to the drawings:—A is a three-armed lever pivoting on a pin, B. The ends of

shown on fig. 1, and guarded by check pins. Each detent has a projection on its side, and the fork, G, has also two projections on it, K K.

A tappet rod, L, passes through a stuffing-box in cylinder end, and also through one in piston. It has two collars, M M, on it. Its end, outside cylinder, is joined to a rod, H, by a cross arm, O (fig. 3). The vertical part of the lever, A, is provided with a pin, as shown at fig. 3, which engages in forked end of O or P, on weigh shaft,



Side Elevation.



Longitudinal Section.

the horizontal arms are bent, as shown on plan (fig. 4), and a rod, C, is secured in them. On this rod is mounted a grooved roller, D, which is embraced by a bridle, E. The bridle is attached to a helical spring, F, which is united at its other end to the holding-down flange of the cylinder, as shown in fig. 1. The roller and bridle can be run to and fro on the rod, C, the spring swinging with it.

The bridle is embraced by a fork, G, mounted on a rod, H. At either end of the lever a tumbler or detent, J, is placed, pivoting as

as shown at fig. 3. This shaft has an arm which engages in slide valve, as shown.

By another arrangement of the tappet gear the rod, L, is fixed to the piston, and passes through cover as before. The horizontal part of A is made longer also. By this arrangement the stuffing-box in piston is done away with, but, as will be seen, the meter takes up more room.

Action of Meter.—When water enters the cylinder it moves the piston to the other end of cylinder; when the piston meets tappet collar, M, on rod L, it moves L with it, and L, by

means of cross arm, O, moves rod, H, and fork, G; G shifts wheel and bridle along rod, C, which is inclined as shown. As the wheel and bridle are thus moved they must ascend the inclined rod, C, and the spring is extended. If the lever were free the spring would pull it down, but it is locked by the detent, J. As soon, however, as the piston has finished its stroke perfectly, it brings the projection on fork against that on detent, and, pushing it aside, lever C is left free, and is pulled down by the spring. This shifts the slide valve, water is

the piston must complete its stroke perfectly before the slide is moved.

In order to prevent noise or shock by too sudden an alteration of direction in the movement of the water, the supply ports are made V-shaped, as shown on plan (fig. 4), and also a perforated plate, P (figs. 2 and 3), is put on top of valve; this causes the cross section of valve to nearly fill up the valve-box like a piston, and therefore the valve cannot move faster than the water can find its way past it in the box. The plate, P, is loose, and simply held in

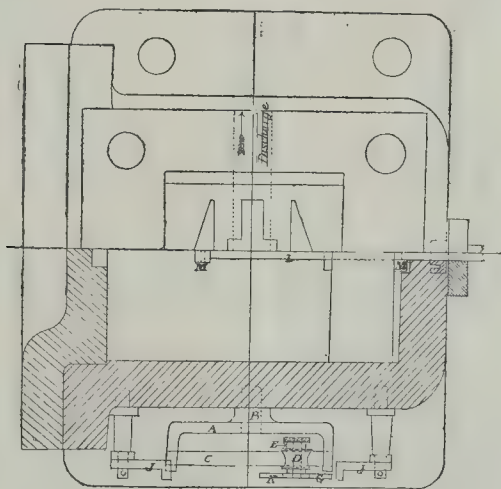
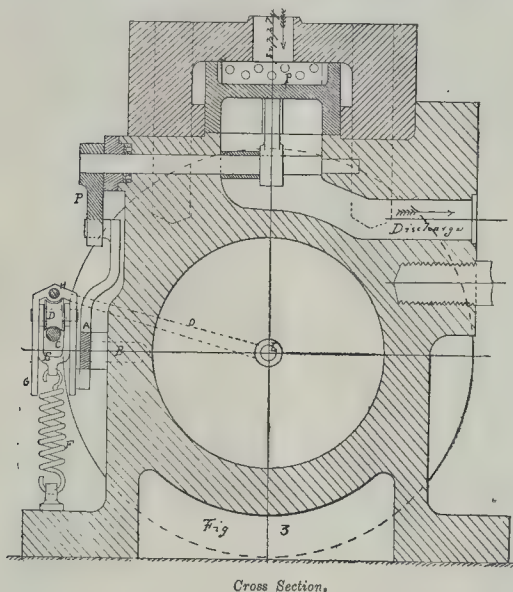


Fig. 4.—Half-Section Plan.

admitted at the other side of piston, and the discharge is opened. When one end of the lever falls the other is raised, and its detent drops under it and locks it. The piston moves again till it meets the other tappet, when it shifts the rods, fork, and bridle once more along C to what is now the higher end, but the lever being locked the spring cannot pull it down till the piston, at the end of its stroke, throws detent off, when the lever, being released, moves the valve, and so the action goes on.

It will be obvious that by this arrangement

recesses in the valve, and plates with various sized holes can be put in to suit the different speeds of the meter.

The meter will work at any reasonable speed, and at any pressure. It can be worked either vertically, inclined, or horizontally. It can be enclosed in a casing locked up, and a counter of any well-known pattern can be fitted to register the discharge. The drawing shows the piston at the end of its stroke, and the detent pushed from under the lever, which is ready to fall and move the slide.

H. W. P.

THE CONGRESS OF FRENCH ARCHITECTS.*

On the third day of the Congress, Wednesday, the 11th ult., about 200 architects assembled to visit the Church of the Sacred Heart, Montmartre, being received by M. Abadie, the architect, member of the Institute. Each visitor received a plan of the building and was to sign his name to an illuminated memorandum of the visit. The church, as may be remembered, was the subject of a competition ten years ago. The subterranean portion is now complete, and the upper portion is beginning to come into shape above ground.* The works are being carried out by M. Riffaud, who is also contractor for the masonry of the Hôtel de Ville, and who has for chief overseer M. Louis Jobert, honoured, like his chief, with one of the medals decreed last year by the Société Centrale des Architectes.

Faithful to the traditions which have been kept up in the workshops for the restorations of the diocesan edifices and historic monuments of France, and which he himself has applied with so much success at Angoulême, Périgueux, Bordeaux, and twenty other less important localities, M. Abadie has taken order that, at the Église de Sacré Cœur, the stone should be brought to the building entirely worked and prepared for its position, so that this builder's yard, alone among those of Paris, echoes no sound of the tool and is encumbered with no débris of waste stone; the selection made of the hard stone of Souppes, near Nemours, which is not easily damaged in transit, has been favourable to this method of working.

We need not repeat all the praises which M. Abadie received from his professional brethren, at the head of whom were MM. Bailly and Ch. Questel. We may content ourselves with observing that the construction of the Église de Sacré Cœur is progressing slowly but surely, and that the subscription, which has already amounted to 14,000,000 francs, increases every day, and that M. Abadie, who is just seventy-two and belongs to a family who are of octogenarian habits, may, we hope, be called upon before long to preside at the dedication of his fine building.

In the afternoon of the same day, M. Bresson, delegate and past president of the Société Académique de Lyons, occupied the chair, and in a short address spoke of the work they had that morning seen, and of the brilliant career of M. Abadie, amid much applause. The secretary then read a letter, the official character of which rather served to emphasise its cordiality of tone, from Mr. W. H. White, secretary of the Royal Institute of British Architects, in the name of Mr. Ewan Christian, their president, thanking the Société Centrale for their invitation to the president and secretaries of the English Institute to be present at the Congress and at the dinner on the 14th; a letter which was very warmly received, many of the members having learned the same morning that the Institute had just given a pledge of the friendship between the two societies in nominating, at their last meeting, on the 9th, M. Alfred Normand, one of the vice-presidents of the Société Centrale, as Honorary and Corresponding Member of their body. According to the order of the day, papers were first read by M. Ernest Desjardins, the eminent archaeologist, Membre de l'Académie des Inscriptions and Belles Lettres, on "the milestone of the cemetery of St. Marcel in the Republic of San Marino" and on the French foot-measure (*le pied Gaulois*). This milestone, of which a cast provided by M. Jules Cousin, Conservator of the Musée Carnavalet, was exhibited, is the oldest monument in France bearing (in an abbreviated form, it is true) the modern name of Paris; and, in a learned though familiar dissertation, M. Desjardins explained that this milestone, the first placed on one of the roads from Paris to Rheims, must have been fixed about the year 307 A.D., and was a relic of Gomerius Maximinus. Some interesting information in regard to the Republic of San Marino, its patricians, its resources, and its Museum of Relics, made an amusing diversion from the more severe archaeological deductions to which M. Desjardins returned at the close in the consideration of the dimensions of the *pied Gaulois*, which he considered to be established as equal to the *pied du roi*.

* See p. 593, ante.

† A double page external view of this church was given in our volume for 1874, p. 408-7. An internal view appeared in our number for Feb. 7, 1880.

After the thanks of the meeting had been given to M. Desjardins for his interesting communication, M. Wallon followed with the reading of a long memoir on "Public Competitions." This question had been raised, he observed, in 1861 by M. César Daly, in the *Revue Générale de l'Architecture*, and since then there had been the following stages in the progress of the matter:—

1. The list of questions proposed by the late M. Davidon in 1872.
2. The memorandum of the Société des Architectes du Département du Nord in 1874.
3. The discussions of the International Congress in 1878.
4. The *résumé*, produced at the Congress of 1882, by M. Ch. Lucas, of the study of the question by the Royal Institute of British Architects.
5. The decision of that Institute which had been communicated to the Congress of 1883.

At that time, said M. Wallon, it had been proposed by M. Chas. Lucas to refer the whole question to an international commission; but that idea having been negatived, and the last congress having expressed a strong opinion that the subject should be considered at the present congress, he had prepared this paper (part of which we shall be able to publish subsequently), merely observing here that M. Wallon's general view was against the official regulation of competitions, and in favour rather of the endeavour to gradually develop a public opinion in the right direction.

In the discussion which followed, M. Chas. Garnier said that, formerly a competitor, now more often an assessor or judge, he had listened with interest to the excellent things said by M. Wallon, but he thought everything human had its bad side, and public competitions more especially; the first business of competitors was to look out for themselves,—in fact, they very often went into a competition without taking the trouble to look into the initial defects and improprieties in the conditions, and without protesting against them as they ought. When a competition was announced, said M. Garnier, then was the time to exercise one's influence in protesting against a defective programme, instead of raising complaints after the result of the competition had been made known.

At the close of the meeting (after a few words from the President) there were handed round copies of the rules of the recently-founded "Société des Amis des Monuments Parisiens," constituted with the object of watching over the ancient art and "Physionomie Monumentale" of Paris. This might be supposed to be a kind of parallel to our "Anti-Scrape" Society, only that it appears to be composed not of sentimental amateurs, but of many of the leading French architects of the day, including MM. Abadie, André, Bailly, Ballu, Cervesson, Corroyer, Daumet, Ch. Garnier, Hardy, Ch. Lucas, Alf. and Chas. Normand, Ruprich-Robert, Sauvageot, Sedille, Questel, Vaudremer, and Wallon. We may hope, therefore, that its tone and its proceedings will be at once more reasonable and more practical than those of the English society which is popularly known by the sobriquet above quoted.

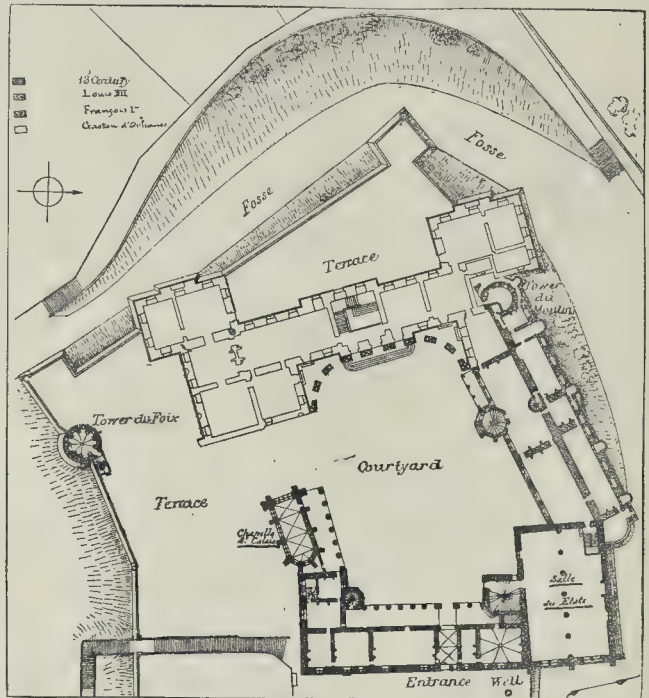
On the fourth day of the Congress an excursion was made out of Paris, as in previous years; and the Congress having on other occasions visited St. Germain, Versailles, Fontainebleau, Amiens, Rheims, Chartres, Chantilly, and Pierrefonds, it was decided this year to visit Blois. About eighty members met at the Gare du Chemin-de-fer d'Orléans at half-past eight, and, having breakfasted *en route* at Aubrais, they came to Blois with the whole afternoon to give to the town and château, so coquettishly poised in its amphitheatre on the Loire, where M. Baudet, architect of diocesan buildings and of the "Monuments Historiques," who has been charged since 1879 with the work of restoration at Blois, did the honours with great cordiality.

The small plan of the château here given may serve to recall, by the various ways of shading, the dates of the main portion of the building, which belongs to the different epochs of the Comtes de Blois (twelfth century), Louis XII. (end of the fifteenth century), Francis I. and the Valois (sixteenth century), and lastly, Gaston d'Orléans (seventeenth century). Unfortunately, the late illustrious Duban, and, with and after him, his devoted lieutenant, M. de la Morandière, have restored a brilliant youthfulness to the Middle-Age and Renaissance portions of the building; and even commenced the restoration of the build-

ings erected by François Mansard for Gaston d'Orléans; these latter constructions, which M. Baudet now has actually under his care, are still far from having regained their primitive splendour. All our readers know how intimately the Château of Blois is connected with the History of France, and what great historic as well as architectural interest attaches to that "Salle des États" where Henri III. proclaimed himself chief of the League; those royal apartments of the Valois, where the Duke of Guise was assassinated; that *Tour du Moulin* or *des Oubliettes*, where his brother, the Cardinal, was made away with, that chamber where Catharine de Medici died some days after that double crime; and those charming specimens of domestic architecture of the Renaissance, the *Galerie* and *Toilette*, the *Cabinet de la Reine* and the *Oratoire*, which make of that part of the château an ensemble of things graceful, rich, and delicate, and beautifully restored and preserved.

various objects of interest in the town, the Fontaine Louis XII., the Hôtels Sardini, d'Alluye, Denis Dupont, and Gaillard, now the Presbytery of the Église St. Nicolas, and some even found time to traverse in haste the stone bridge with its obelisk, and reach the Église St. Saturnin, in the Faubourg de Vienne, and the General Hospital, of which the cloister, with its Renaissance colonnade, merits special mention.

On Friday, the 13th, at nine, there was a rendezvous at the Gare St. Lazare for the visit to Asnières, where brakes, put at the disposal of the party by M. Alphonse, waited to conduct them to Gennevilliers. There M. Durand-Clay, sanitary engineer, explained, as he had already done in a remarkable paper read before the Société Centrale, the advantages of the system of "decanation" of the sewer waters, and the fertilisation, by the aid of the manure thus obtained, of the wide sandy plains which compose the Isthmus of Gennevilliers. But we will not go into the details of that technical



Plan of the Château of Blois.

The part belonging to the date of Louis XII. is not less interesting, and expresses well in its façade of stone, cleverly combined with brick, and bearing the date 1501, the character, at once sober and elegant, of that earlier French Renaissance, less Italian and proportionately more national than that of the Valois, and in which one may find, in no disagreeable or harsh contrast, the last lingering souvenirs of the late Flamboyant Gothic mingling with the details of the new style. A half-remnant of Gothic feeling still lingers in the Francis I. architecture, which forms the finest and most generally admired portion of the château, as in the newel of the famous staircase, of which we give an illustration, by way of memorandum, in the present number.

When M. Baudet shall have completed the *Aile de Gaston* (where is to be installed, we believe, the Municipal Library), this portion, at present a little slighted by architects and archaeologists, will take the place it deserves in general interest; for, besides the colonnades which, on the court side, accompany the principal entrance, it offers large and fine rooms, admirably served by the staircase, which is one of the most beautiful examples of the work of François Mansard.

After entering the château, the party went to the church of St. Nicolas (or St. Laumer), a curious specimen of the Transitional style and of the Early Gothic, and then inspected

study, which dealt with matters with which architects have, at the present day, ample opportunity to familiarise themselves, partly owing to the important place which these subjects now take in universal exhibitions and international congresses.

New Roman Catholic Church, Parbold.

—The new Roman Catholic Church of Our Lady and All Saints at Parbold has been consecrated. The church is the gift of Mr. Hugh Ainscough, of Parbold. The structure has cost altogether 15,000*l.*, and Mr. Ainscough, in addition, has given a large plot of land for a burial-ground, and has also built a substantial presbytery for the pastor. The church is Gothic, and has a tall steeple which can be seen for miles around. The building is entirely of local stone. The roof is supported by two rows of plain massive pillars, and the fittings are most elaborate and complete. The altar is constructed of marble and alabaster, and the altar window is large and ingeniously carved. The altar and reredos have been executed by Messrs. Sherratt & Owens, of Preston. The church has been built from designs by Mr. Edmund Kirby, architect, of Liverpool, and the building operations have been carried out by the workpeople employed by Mr. Ainscough. At the present time there are sittings for 400 people, but the church is capable of accommodating 500.

A MODEL BAKERY.

At the invitation of Messrs. W. Hill & Son, of Bishopsgate and Victoria-street, a number of gentlemen on Saturday last visited the new Model Bakery just opened by the firm in Alexander-street, Westbourne Park.

The *modus operandi* pursued by Messrs. Hill at this bakery presents some points well worth notice. To begin with, the water which is used in the bakery flows from a cistern which is completely cut off from the rest of the water supply, through one of Johnson's patent filter presses,—an ingenious combination of coils of iron and of blotting-paper that is especially prepared for the purposes of filtration. This paper is very frequently renewed. The potatoes, a small quantity of which enters into the earlier stages of all bread-making on an important scale, are not boiled "willy nilly" and added to the yeast in the customary manner, but are steamed in separate perforated chambers, and by that means freed from fusel oil and all other deleterious and offensive matters. The potato starch, thus purely prepared, is amalgamated with the yeast-plant, and fermentation proceeds on a plan which has been brought to perfection by Mr. Hill after experiments extending over a period of eighteen months. Thenceforward every successive stage in the manufacture of the bread is carried out with the aid of machinery, and, throughout, the proper temperature is regulated by means of thermometer tests. Nothing, indeed, is left to chance or "the rule of thumb." The dough is manipulated by Pfeiffer's dough-making machine, containing revolving blades that bear some resemblance to the screw propeller of an ocean steamer. In order to overcome the obstacle which occasionally interferes with the successful kneading of dough by machinery,—the difficulty of keeping a proper temperature, and thereby preventing the arrest of graduated fermentation,—the mixing receptacle is enclosed in a hollow wooden jacket and kept warm by means of a pipe which conveys the necessary steam from an adjacent boiler. And now, mixing and kneading and every concurrent operation having been accomplished, and that without handling, the dough is projected into movable troughs, wheeled into the bakehouse, weighed, and moulded, and in due course placed in the oven. A particularly sweet, nutty flavour which Messrs. Hill claim to give to the bread here produced is partially attributable to the fact of its being baked in ovens heated with hazel-wood and similar aromatic "barkins."

The bakehouse is an underground one, but is well lighted and ventilated, special conveniences being provided for the *employés* quite away from it. The arrangement is, however, as we understand, only tentative, Messrs. Hill having taken and adapted to their present experimental purposes an ordinary baker's shop and bakery.

In the course of the proceedings Mr. Lakeman, H.M. Inspector of Factories, spoke highly of the arrangements, as did Dr. Tripe, Dr. Wynter Blythe, Dr. Lovett, Dr. Lee, and one or two trade experts. One point of contention there was between Mr. Lakeman and Dr. Tripe, Mr. Lakeman contending (without reference to the bakehouse under notice) that, as a rule, bakehouses should never be underground; for, if they were, they would most likely be dark and dirty. Dr. Tripe, on the other hand, contended that an underground bakehouse, provided it was well lighted, well ventilated, and properly "sanitized" in every other respect (and unless it complied with these conditions it should never be allowed), was better than one above ground, because a more equable temperature could be maintained underground, equality of temperature being an important factor in bakehouse economy.

The Russian Cement Industry.—The French consul at St. Petersburg has communicated to his Government some information on the above subject. The manufacture of Portland cement is only represented in the St. Petersburg district by a large establishment at Port Kunda, on the coast of Esthonia (the annual production of which is about 7,400 tons), and by a smaller factory, near the capital. The last re-adjustment of the customs tariff has been favourable to the development of the industry. Plaster is made on a large scale at St. Petersburg, this industry occupying seven factories, which produce annually 23,000 tons.

ARCHITECTURE AT UNIVERSITY COLLEGE.

The following list of awards to students has been forwarded to us by Professor Roger Smith:—

Fine Art.

Donaldson Silver Medal ...	E. Nicholson, London.
Second Prize	José Suarez, Bogota.
Third Class	{ W. H. Eve, London. E. F. King, London.

Construction.

Donaldson Silver Medal ...	E. W. Knight, Greenwich.
Second Prize	A. T. Bolton, London.
Third Certificate*	Frank Taylor, London.
Fourth Certificate*	R. M. Hamilton, New Zealand.
Second Class	{ J. R. Morgan, London. F. W. Quick, London. T. D. Atkinson, London.
Third Class	{ C. F. Blomfield, London. E. F. King, London. J. Swift, Peckham. J. M. Watson, London.

Modern Practice.

Prize	W. C. Jones, Forest Hill.
Second Certificate*	J. R. Morgan, London.
Third Certificate*	E. L. Conder, Leeds and London.
Fourth Certificate,* equal	{ R. L. Cole, London. W. Millard, London.
Second Class	{ R. M. Hamilton, New Zealand. F. W. Quick, London.
Third Class	T. G. Williams, Liverpool.

HATCHETT'S HOTEL.

SIR,—In your last issue [p. 911] there appears a description of Hatchett's Hotel. In justice to Mr. J. in the contract, was to be completed by a specified time under a penalty of 10*l.* per week, to be forfeited by the contractor to the proprietor for each and every week it remained incomplete after that date. A proviso was made, however, that for every 30*l.* of extra work done by the contractor, an extra week's time was to be allowed to him. The building was not completed until some weeks after the time specified; this, it was alleged by the plaintiff, being due partly to the additional work executed, bad weather, and other causes.

W. S. WEATHERLEY & F. E. JONES,
20, Cockspur-street, London, S.W.

ARBITRATION CASE.

CLARK v. BOOTH.

THE plaintiff is a contractor at York, and built the new Salvation Army "Barracks" there, which were completed in 1883.

The contract sum was 2,160*l.* In carrying out the work various extras occurred, such as additional foundations, and sundry other items not provided in the contract. The building, under the terms of the contract, was to be completed by a specified time under a penalty of 10*l.* per week, to be forfeited by the contractor to the proprietor for each and every week it remained incomplete after that date. A proviso was made, however, that for every 30*l.* of extra work done by the contractor, an extra week's time was to be allowed to him. The building was not completed until some weeks after the time specified; this, it was alleged by the plaintiff, being due partly to the additional work executed, bad weather, and other causes.

The plaintiff's account for extra work not being agreed to, he eventually brought an action against the defendant at the Leeds Assizes in January last for 551*l.* 12*s.* 10*d.* for balance due under the contract, and for extra work. The defendant paid into Court the sum of 325*l.*

When the case came before the Judge, it was ordered to be referred, and Mr. Walton, barrister, was appointed arbitrator. The case was partly heard at Leeds in the first instance, afterwards at York, and was completed in London, and has occupied twelve days. The defendant admitted the principal part of the extra work charged for as having been done, but argued that the contract quantities for the original building were greatly in excess, and set up a number of counter-claims for works said not to have been executed, also penalty for delay in the completion of the building.

The award has just been declared, and the arbitrator has given the plaintiff the sum of 110*l.* 5*s.* 2*d.* in addition to the 325*l.* paid into court, the defendant to pay all the costs of the action.

Mr. Witherforce, barrister, has conducted the case on behalf of the plaintiff, and Messrs. L. & W. Thompson, of York, have been the solicitors, and Mr. W. Brown, architect and surveyor, York, was engaged for the plaintiff. For the defendant, Mr. Subhart, barrister, appeared, and his case was also represented by Mr. E. J. Sherwood, the defendant's architect, and Mr. Cairne, architect, Manchester, and Mr. Thorp, architect, Leeds.

* Obtained marks qualifying for a prize.

STAINED GLASS.

Swansea.—Two large stained-glass windows have just been placed in St. John's Church, Gower-road, Swansea. The east window, which consists of three lights, has for its subject The Ascension. Our Lord ascending, clothed in light garments, against a rich background, and surrounded by seraphim, forms the central object of vision, and beneath a cloud at his feet are the Mother of Our Lord and St. John the beloved disciple gazing at their departing Lord. In the side lights are the other disciples kneeling or standing, gazing and adoring Our Lord. The subject, which runs through the three lights, is richly treated as to colour, and is placed upon a base of ornamental work, and under canopies of similar treatment. The south side of the chancel has a three-light window and single light in which the subjects represented are as follows:—First light: "The Call of St. John from his Fishermen's Boat of Mending Nets." Second: "The beloved disciple leaning upon Our Lord's Breast." Third: "St. John on the Mount of Transfiguration"; and the last single light, "St. John in exile at Patmos." The scene depicted in the last light is when the vision of the Lamb burst upon St. John. The cartoons for these windows were prepared by Mr. J. W. Camm, and the work has been carried out by Messrs. R. W. Winfield & Co. (successors to Camm Brothers), Cambridge-street, Birmingham.

Bournemouth.—The fine five-light east window of St. Michael's Church, Bournemouth, has lately been filled with Munich stained glass, the gift of Miss Durrant, of Branstead Hall, Norfolk, in memory of her uncle, the late Mr. George Durrant, of Norwich, through whose beneficent acts the church was mainly erected. The text illustrated is Matt. xi. 28,—"Come unto Me, all ye that labour." The window is by Messrs. Mayer & Co., of Munich and London.

Langham.—Three ornamental windows have lately been erected in the Parish Church of Langham, near Colchester. In its various texts of Scripture have been illustrated by trees or plants, such as the "Yew," the "Olive," the "Thorn," and "Immortelles." These works are from the studios of Messrs. Mayer & Co.

Eastbury.—The east window of Eastbury Church, Lamborne, Berkshire, has had a stained-glass memorial to the memory of the vicar's wife, placed in it by her husband, the Rev. G. F. Forbes. It is a five-light window, of the Decorated style of architecture, with a number of openings in the tracery. The subject chosen is the "Ascension," the figure of the Saviour being in the centre, opening with groups of angels surrounding him on a ruby ground, dispersed with stars, and beneath him the Virgin Mary and St. John, with the other disciples, grouped on either side, on a blue ground. The work has been carried out by the firm of Ward & Hughes, of Finch-street, Soho, London, who lately executed the side window in the same church.

Northfleet.—A stained-glass window has been placed in the chancel of Northfleet Church, Kent. The window is of two lights, and contains figures of SS. Philip and Bartholomew. The window was designed and executed by Messrs. Warrington & Co., of Fitzroy-square.

Hartley Wintney.—The new south transept window of Hartley Wintney parish church has been erected in memory of Mr. John Measure, barrister-at-law, late of Sherwoods, who died on the 25th of November, 1882, aged eighty-five. In the top tracery, above the four lights, our Lord is represented as seated in glory. In the upper portion of each of the lights is a full-length figure of an Evangelist, with a copy of the Gospel in his hand, and in the lower portion is depicted an incident specially characteristic of the life or record of each. At the bottom of each light the symbols of the Evangelists are introduced. The canopy work has the figures of angels introduced, and the general effect is described as eminently satisfactory. The artists were Messrs. Lavers, Watkinson, & Co., of Endell-street, Bloomsbury.

Withycombe.—The memorial-stones of a small Wesleyan chapel at Withycombe, near Exmouth, Devon, have been laid. The work of building the chapel has been placed in the hands of Messrs. Perry & Son, of Exmouth, and the architect is Mr. Carter, also of Exmouth.

Books.

The Admission Registers of St. Paul's School, from 1748 to 1876. Edited, with biographical Notices and Notes on the earlier Masters and Scholars of the School from the time of its foundation, by Rev. ROBERT B. GARDINER, M.A. London: G. Bell, 1884.

THE above is the lengthy title of a painstaking volume, in which much of the past history of Dean Colet's celebrated school is carefully given. The school buildings, facing the east end of St. Paul's Cathedral, occupy a position of prominence to which it cannot be said that they impart any additional beauty. They were erected in 1823, in place of the inconvenient structure which had stood, though not without support, since 1670, and which (according to Strype, who was educated within its walls) "was built much after the same manner and proportion" as the original school, completed in 1510. A noisy thoroughfare is, without question, a most unsuitable spot for educational purposes, and in the course of the present year St. Paul's is to be removed to ampler and more secluded quarters at West Kensington. Hitherto, in accordance with the founder's wishes, the number of scholars has been limited to 153; in future it may reach 1,000. The muster-roll of great men who spent some of their boyhood within the school walls is a long one, and includes the names of Milton and his critic, Bentley; John, Duke of Marlborough; Samuel Pepys, the annalist; Leland, Camden, and Gale, the antiquaries; Halley, the astronomer; and, in our own times, Lord-Chancellor Truro, Chief Baron Pollock, Professor Jowett, and several bishops. Mr. Gardiner has added greatly to the value of his book by the introduction of ground-plans of the three successive schools, and has given in an appendix much information about the nature and uses of the buildings; but even he does not seem to have discovered the names of their respective architects.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

June 13.—8,927, T. Tobitt, London, Window-shades.—8,929, F. West, Lewisham, Portable Travelling Scaffold and Concrete Elevator.—8,930, J. T. Richardson, London, Air-tight Receptacle for Refuse, &c.—8,931, R. Schomburgk, London, Spraying Apparatus for Ventilation, &c.—8,943, S. Bivort, Jumex, Belgium, Pavement or Flooring.
June 16.—8,997, O. Gibbons, Ironbridge, Making and Ornamenting Plastic Clay Slabs, Tiles, Architectural Ornaments, &c.—9,003, T. B. Burns, Camelford, Securing Thatch on Houses, &c.—9,006, J. Adair, Waterford, Kitchen Ranges, &c.—9,018, C. Toope, London, Fireproof Blocks or Slabs.—9,023, W. Lord, Middlesbrough, Ventilation.
June 17.—9,071, R. H. Hepburn, London, Prevention of Smoke in Domestic Fire-grates.—9,073, R. W. Boyd, London, Stove for Introducing Fresh Warm Air.—9,114, H. B. Bourne and H. R. F. Bourne, Castors for Furniture.
June 18.—9,119, W. Potts, Edinburgh, Ventilating Buildings, &c.—9,126, J. Thomas, Wrenbury, Hinges.—9,130, J. S. Haslip, Maidstone, Concrete Building.
June 19.—9,164, G. Birkitt, Derby, Cooking Ranges.—9,172, W. Morgan, Birmingham, Latches for Gates and Doors.—9,180, T. McGrall, Sheffield, Domestic Cinder-raker.—9,181, E. Verity and J. M. Verity, Leeds, Chimney-cowl.—9,200, C. D. Abel, London, Fireproof Dwelling-houses, &c. Com. by P. Franquin, Paris.—9,207, J. Whiteley, Salford, Treads of Staircases, Flooring, &c.

SPECIFICATIONS ACCEPTED.†

June 17.—7,273, H. J. Allison, London, Door-bolt and Burglar Alarm. Com. by R. G. Vassar, New York, U.S.A.

June 20.—822, A. C. Smith, London, Spiral Up-draught Exhaust Chimney-cowl and Roof Ventilator.—7,119, J. T. Thompson and W. Thompson, Wexford, Concrete Building.—7,799, W. J. Gwynn, Malvern, Folding-steps.

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending June 21, 1884.

5,102, G. Davies, Manchester, Stoves. Com. by F. Jackson, San Francisco, U.S.A. (Oct. 27, 1883, price 6d.)

The fireplace has three grates, two of which are horizontal and hung on pivots, and levers are fitted by which they can be raised or lowered. The third grate is curved and hung in front to prevent the coal on the other two falling out when they are lowered. The flue passes from the back downwards below the oven and round the same, then over the top plate thereof to the chimney. The sides of the oven are corrugated. Meat to be roasted is attached to a spit fitted on an axle in the oven, and passing

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

out at the sides thereof, which is driven by a worm and wheel actuated by a smoke-jack in the chimney.

5,112, J. W. Gibbs, Liverpool, Ventilators. (Oct. 29, '83, 6d.)

This is an improvement on Patent No. 3,515 of 1881 in enlarging the holes and covering them with a series of counter-balanced levers. The four openings also are formed into cowls and the cross-divisions are taken well down into the shaft.

5,211, G. W. von Nawrocki, Berlin, Floors, Thresholds, &c. Com. by Messrs. F. Arnecke & Co., Blankenburg, Germany. (Nov. 2, '83, 6d.)

Pieces of cross-grained or diagonally-grained wood are placed in positions where there is much wear and are glued to long planks and secured thereon by leathers.

5,216, F. A. Wendt, Croydon, Ventilating Rooms, &c., and Preventing Smokey. (Nov. 2, '83, 2d.)

The fresh air is admitted through ventilating bricks, and the pipes open through the floor of the room where the mouths thereof are governed by rotating perforated discs. When one is placed near the fire the current of air assists to consume the smoke.

5,221, F. U. Sayde, Birmingham, Curtains and Drop-scenes for Theatres, &c. (Nov. 2, '83, 6d.)

To confine the fire to the place where it originated the curtains, &c., are formed of wire gauze, which may be covered as desired.

5,270, T. Bauchop, Allosa, Ventilator. (Nov. 7, '83, 6d.)

A tube leads from the room to be ventilated, and surrounding its end is a larger tapered tube above which again is another similar tapered tube, and above all a conical cap. Annular openings are left below the cap and between the two tapered tubes. A cylinder surrounds all, which has also a conical top. The air, therefore, rising from the room is deflected through the annular openings, and passes up the outer cylinder.

5,285, E. Barber and B. Barber, Tring, Blinds. (Nov. 8, '83, 2d.)

These Venetian blinds have an additional lifting-cord, which is secured to one of the middle laths, so that the blind may be drawn half way up, and the closed laths are at the top and not as is usual at the bottom. (Pro. Pro.)

5,599, D. Clarke, Birmingham, Arrangement of Tiles for Educational Purposes. (Dec. 23, '83, 2d.)

The faces of these tiles are decorated with suitable designs and are applied to the walls, dado, or other surfaces for educational purposes.

MEETINGS.

SATURDAY, JUNE 28.

St. Paul's Ecclesiastical Society.—Visit to the Churches of East Barnet and Monken Hadley. Papers will be read by the Rev. C. E. Hadow and the Rev. F. C. Cass. Train leaves Moorgate-street at 2.35 p.m.

MONDAY, JUNE 30.

Victoria Institute.—Annual Meeting. 8 p.m.

TUESDAY, JULY 3.

Royal Archeological Institute.—(I) Professor B. Lewis on "Roman Antiquities in Switzerland"; (II) Mr. R. C. Hope, F.S.A., "On the Church Plate of Rutlandshire"; (III) Mr. F. Helmore on "Stone Coffins lately discovered in Hert's."

Miscellaneous.

Value of Building Land in Wandsworth-road.—Last week Messrs. Hards, Vanghan, & Jenkinson submitted for sale, at the Auction Mart, the extensive freehold property known as the Springfield Estate, situated at Vauxhall, fronting the Wandsworth-road. The property consists of about ten acres and a half of freehold building land, with a frontage to the Wandsworth-road of 766 ft. in length, and abutting in the rear on the London and South-Western Railway Company's works. It also included about fifty houses. The property was described as particularly worth the attention of societies and others contemplating the erection of dwellings for artisans. It was added that it might be reasonably expected that in this situation such dwellings would command higher rents than those situated even as far as three miles from the centre of London, where there was a constant supply of tenants at rents varying from 2s. to 3s. per room. The property was offered in six lots. The first lot offered consisted of 80,840 square feet, with a frontage of 167 ft. to Wandsworth-road, for which 9,000l. was the highest sum offered, but which was bought in at 10,000l. For the next lot, containing 104,500 square feet, with a frontage of 208 ft. to the Wandsworth-road, 9,000l. was the first offer, and the highest bid 11,600l., the lot being bought in at 12,500l. Two other lots, one containing 71,650 square feet, with a frontage of 151 ft. to Wandsworth-road, and the other containing 74,800 square feet, with a frontage of 150 ft. to Wandsworth-road, were each bid for up to 8,000l., but bought in at 9,000l. Two other lots, containing respectively 57,600 ft., and 44,650 ft., were withdrawn. For the four lots thus submitted an aggregate sum of 36,600l. was offered, being at the rate of about 4,500l. an acre, but bought in at 5,000l. an acre.

Co-operative Shoe Works, Leicester.—The extension to the Co-operative Shoe Works, Dun's-lane, Leicester, has been formally opened in the presence of a number of the members of the Co-operative Central Board and the Co-operative Wholesale Society; Mr. J. Stansfield, of Heckmondwike, chairman of the Productive Committee, presiding. The structure is now enlarged forms one of the most extensive shoe factories in Leicester. The building occupies a triangular site, with a frontage of about 190 ft. to Dun's-lane, and about 200 ft. to the river Soar. The main block consists of five large flats, each containing about 8,600 square feet, all well lighted from the frontages, and also from a central yard or area. A lower (three-story) building occupies the south-western portion of the site. The architecture of the building is of Classic character. The materials for the principal fronts are red pressed bricks, with ornamental dressings of Coalville and Reading brick, Coalville terra cotta, and Derbyshire stone. The principal front is that towards Dun's-lane, the length being 190 ft., and the height of the main block 60 ft. from the street level to the top of the parapet. The central block is crowned with a bold frieze and pediment, the tympanum being enriched with arabesque ornament in carved brick. The building is heated throughout by steam on the high-pressure system. For ventilation, fresh air is admitted by means of numerous upright shafts, the foul air being extracted by flues carried up above the roof, and fitted with patent extraction ventilators. The contractors for the works are as follow:—Builder's work, Mr. J. O. Jewsbury; carpenter and joiner's work, Mr. J. Cox; ironfounder's work, Messrs. Illston & Arnold; plumber's, glazier's, and painter's work, Messrs. Norman & Underwood. The mason's work has been executed by Mr. A. Wesiman, and the carving in brick and stone by Mr. S. Wilmott. The heating is by Mr. Thompson, of Rawdon, and the hoist work by Messrs. Waygood & Co., of London. The architect is Mr. J. Tait.

Society of Arts.—A *conversazione* will be held at the International Hand Exhibition by the Council of the Society of Arts, in conjunction with the Executive Council of the Exhibition, on Wednesday evening, the 9th of July. The whole of the buildings will be open, and the gardens will be illuminated.—The Council of the Society have awarded the Society's Silver Medals to the following readers of papers during the session, 1883-4:—

To the Most Hon. the Marquis of Lorne, K.T., for his paper on "Canada and its Products."

To Rev. J. A. Rivington for his paper on a "New Process of Permanent Mural Painting, invented by Joseph Keim."

To C. V. Boys, for his paper on "Bicycles and Tricycles."

To Professor Fleeming Jenkin, F.R.S., for his paper on "Telpherage."

To I. Probert, for his paper on "Primary Batteries for Electric Lighting."

To H. H. Johnston, for his paper on "The Portuguese Colonies of West Africa."

To Professor Sir James P. Thompson, for his paper on "Recent Progress in Dynamo-Electric Machinery."

To Edward C. Stanford, F.R.S., for his paper on "Economic Applications of Seaweed."

To W. Sten-Karr, for his paper on "The New Bengal Rent Bill."

To C. Gordon Clarke, C.I.E., for his paper on "Street Architecture in India."

Proposed Re-building of the City Free-men's Almshouses at Brixton.—On the report of the Freeman's Orphan School Committee on a reference of April 3rd, 1884, to advertise for designs and estimates for the re-erection of the London almshouses at Brixton, and to submit the same for approval, the Court of Common Council has resolved to adopt the design bearing the motto "Through Ventilation," the cost of executing which was put at 8,500l., and have awarded the sum of 50l. to the authors of the design "*Domine Dirige Nos*," estimated to cost 10,600l. Messrs. Davis & Emanuel are the authors of "Through Ventilation," and Messrs. Hooker & Hemmings of "*Domine Dirige Nos*."

The Labour Market in Canada.—The Montreal *Daily Witness*, of the 9th inst., strongly depreciates unrestrained emigration to Canada, and contradicts statements made in this country to the effect that work of all kinds is plentiful in the colony. There is, doubtless, says the *Witness*, room and work for thrifty farm-labourers, but not for unassisted emigrants who know nothing of agricultural work.

Sanitary Statistics at Whitehall.—The resignation of Mr. Frederick Purdy of the office of Principal of the Statistical Department of the Local Government Board, after a service under the Crown of no less than forty-eight years, suggests a variety of reflections. If Mr. Purdy were to put his experiences into writing, we might get an idea, denied to the coming generation, of the way in which things were managed when her present Majesty came to the throne. Those were the days before germs and bacteria and sewers and "zymotic" were heard of. No troublesome figures about local taxation puzzled the heads of economists. Mr. Bumble then exercised imperial sway in the poor-houses, and no interfering inspectors popped in at inconvenient moments to taste the porridge or check the parish books. Mr. Purdy in his day has given to the world many millions of figures about one and another branch of Poor Law and sanitary work; but for the most part these have fallen flat upon an unregenerate and ungrateful public. So far as statistics can help us, there is by this time a sufficiently large accumulation of facts at hand to warrant some sort of general conclusion as to the results, from a sanitary and neurological point of view, of the expenditure on drainage, water supply, and the like, of the last twenty years or so. But the figures as to expenditure are immured at Whitehall, and the figures as to deaths at Somerset House. Might it not be feasible, and would it not be very useful, that the two statistical staffs that own our supreme heat should be amalgamated, or, at least, so co-ordinated that some sanitary statistics really worth having could be issued in a form to be understood of the people? At present the mass of local indebtedness that goes on increasing after the fashion of a snowball sadly needs justification.

—*Sanitary Record.*

The Site of an old City Church in the Auction Market.—A short time ago the Church of St. Matthew, Friday-street, Cheapside, was demolished, this being one of the City churches which was condemned with the view of the sites being sold, and the proceeds applied towards the erection of new churches in other parts of the metropolis. Last week nearly the whole of the site of the church was offered for sale at the Auction Mart, by direction of the Ecclesiastical Commissioners, Messrs. Fuller, Horsey, & Co. being the auctioneers. The rectory-house adjoining was included in the sale. The property has a separate right-of-way into Cheapside through a passage known as Fountain-court. The frontage to Friday-street is 39 ft. in length, and the one facing Church-court is 67 ft. long. The total ground area, including the rectory-house, was described as containing 3,475 ft., but in submitting the property the auctioneer remarked that since the advertisement to sell was issued the Commissioners of Sewers had served notice to take a part of the site to widen Friday-street, and this portion would, therefore, be excluded from the sale. He observed that this intended widening of Friday-street would very materially enhance the value of the site, which the purchaser would have the advantage of without paying for the increased value which the widening of the street would give to the property. As regarded the value of the site he said that, comparing it with other land in the immediate locality, he considered it was well worth 10l. per foot, which would represent something like 40,000l. The first bid was 15,000l., and by advances of 1,000l. and 500l. each the property was quickly brought up to 29,500l., when the bidding ceased, on which the auctioneer said he could not sell at that sum, and it was bought in on behalf of the vendors for 29,900l.

Cradock Waterworks, South Africa.—The Municipality of Cradock have approved of the scheme for the water supply of that town submitted by Messrs. G. B. Nichols & Sons, civil engineers, of London and Birmingham. The supply is to be derived from permanent springs at Drie Fontein, about five miles from Cradock, on land belonging to Mein Herr Janse Van Rensburg, M.L.A. The water is diverted from the stream into filtering-chambers constructed in connexion with a service reservoir, and conducted into the town by gravitation on the constant-service system, distributed by means of cast-iron pipes with stand-post hydrants. In the Market-square it is proposed to erect a handsome stone fountain for drinking purposes and for the use of cattle.

The Library, International Health Exhibition.—The library, which was opened to the public on Monday, the 16th inst., has been organised by a special sub-committee, appointed in February last by the Executive Council. The original intention was to refer to this department the exhibits comprised within the "Literature" class, under each group of the two divisions into which the Exhibition has been divided. But besides dealing with these exhibits in this way, the Library Sub-committee have brought together a large collection of official reports, central and local, bearing on the administration of sanitary laws at home and abroad. In their endeavours to render this part of their work as complete as possible, they have been much indebted to her Majesty's Government for valuable assistance rendered by the Secretary of State for Foreign Affairs, who, at the request of the Duke of Buckingham and Chandos, the chairman of the Executive Council, caused to be issued to British diplomatic representatives abroad circulars inviting them to obtain lists, accompanied by specimens of reports and works bearing on the administration of the sanitary and education departments of the countries to which they were accredited. The Library Sub-Committee have also been in correspondence with the mayors of boroughs and chairmen of local boards, with a view to obtain copies of local sanitary acts and reports, of which a large number have been received. The Committee have, furthermore, entered into correspondence with the authorities of all the principal health resorts at home and abroad, in order to obtain a collection of guide-books and medical and popular treatises referring to the climatic and other advantages of these places, and, as a result, an interesting feature of the Library will be the varied collection of books and photographs received from a large number of these resorts. Authors and publishers throughout Europe have also been invited to send contributions, and the Committee feel that they are much indebted to them for the ready response made to their appeal. The number of books now received amounts to about 6,000. The room in which the Library has been arranged is in the Albert Hall, overlooking the Conservatory. Its furnishing and decorations have been intrusted to Messrs. Liberty & Co.

The Last of the Grand National Opera House.—The sale of the materials of the unfinished Opera House on the Thames Embankment has taken place during the present week, and in a short time the partly-erected building, which, so far as it had proceeded, cost about 80,000l., will have been cleared away and distributed amongst dealers in building materials, who have purchased them under the hammer for little more than 2,000l. The sale embraced 289 lots, of which 157 lots were sold on Tuesday. With the exception of the iron work used in the erection of the box and pit circles, the lots included in the day's sale consisted, for the most part, of blocks of Portland, Bath, and other stone, together with timber and miscellaneous materials which have remained on the ground ever since the works were suspended. Merely nominal prices ruled throughout the day, the several purchasers securing profitable bargains, more especially with reference to the stone. The highest prices obtained during the day were 20l. for a cast-iron mortar-mill, 17l. for an overhead traveller, 12l. each for two other travellers, and prices varying from 12l. to 20l. each for the timber gables under the travellers. The iron columns and girders around the pit and box circles realised an aggregate of 220l.; the entire proceeds of the day's sale amounting to little more than 500l. The sale was continued on Wednesday, when there was a very large attendance, the day's proceeds amounting to 1,540l., which, added to the sum realised by Tuesday's sale, brought up the aggregate amount of the proceeds of the sale to about 2,050l. In addition to the materials of the Opera House, the materials of six houses and shops in Cannon-row and Parliament-street were sold, realising 160l. The sale was conducted by Mr. C. Horsey, of the firm of Messrs. Fuller, Horsey, Sons, & Co.

The Central Technical College, South Kensington.—was opened on Wednesday last by H.R.H. the Prince of Wales. We gave a large view, together with a plan of this building (which has been erected under the superintendence of Mr. Waterhouse, A.R.A.) at the beginning of the present year.

Board Schools, Walton.—On the 16th inst. the foundation-stone of the first schools to be erected by the Walton School Board was laid by the chairman of the Board. The schools, which are to be situated in Arnot-street, off County-road, will cover an area of about 3,000 square yards, and are intended to accommodate about 1,500 children, who will be divided into four nearly equal sections, namely, senior boys, senior girls, juniors mixed, and infants. The several rooms will be so arranged as to admit of their being lighted and ventilated on both sides. It is intended that the upper story shall be utilised as a cookery school for girls. The architect is Mr. Edmund Kirby, of Union-buildings, Cook-street, Liverpool, and the contractor is Mr. Thomas Ray, of Seel-street, Liverpool.

The Institution of Civil Engineers.—During the past five years there has been an increase in the number of Honorary Members from 17 to 21; of Members, from 1,148 to 1,438; of Associate-Members, from 1,200 to 1,864; and of Students, from 551 to 777; while the number of Associates has decreased from 623 to 510. In June, 1879, the total of all classes on the books was 3,579; now it is 4,610.

TENDERS.

For rebuilding premises at Queen's-road, Baywater, for Mr. W. Whiteley. Mr. J. E. Saunders, architect. Quantities by Mr. Richard Osborn, of No. 153, Fenchurch-street:—

	Time.
Colls & Sons	229,643 .. 9 months.
Nightingale	66,430 .. 8 "
Conder	67,068 .. 8 "
Patman & Fotheringham	66,890 .. 10 "
McGregor	66,682 .. 8 "
Ashby & Horner	66,255 .. 8 "
Holland & Hannan	65,390 .. 4 "
Brass	64,983 .. 4 "
Sheppard	59,710 .. 6 "

For re-instating Nos. 5, 6, and 7, Ivy-lane, E.C., Messrs. Smith Bros. Mr. Wimble, architect:—

Smith & Sons	2,113 0 0
Falkner	2,135 0 0
Scrivener & Co.	2,147 0 0
Laurence & Son	2,085 0 0
Morter	2,090 0 0
Croaker	1,960 0 0

For the erection of new school buildings and alterations to Wellington-road Baptist Chapel, Stoke Newington. Mr. Hampden W. Pratt, architect, 6, Duke-street, Adelphi. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street, Chancery-cross:—

J. Duthwaile & Son, Smithfield	21,770 0 0
L. H. & R. Roberts, Islington	1,950 0 0
Higgs & Hill, South Lambeth	1,680 0 0
Cheesum, Great Eastern-street	1,672 0 0
Page, Croydon	1,675 0 0
G. Garrud, Hackney-road	1,473 0 0
Wilson & Exton, Aldersgate-street	1,460 0 0
E. Triggs, Clapham	1,294 0 0

For alterations and additions to the Rectory House, Kington, Leicestershire. Mr. John W. Alexander, architect, Middleborough and Stockton-on-Tees. Quantities by Mr. Wm. Lunn, Kidderminster:—

Kirk & Parry, Bisleford	21,270 0 0
Wartnaby & Son, Grantham	1,160 0 0
J. J. East, Melton Mowbray	1,132 0 0
Barclay Bros., Lynn	1,090 0 0
C. Barnes, Melton Mowbray	1,090 0 0
T. Thurman, Cotgrave, Notts	1,063 0 0
Geo. Chester, Waltham	965 0 0
* Reduced estimate (accepted) £240 2s. 7d.	

For building St. John's Vicarage, Stillington, Durham. Mr. John W. Alexander, architect. Quantities by Mr. W. Lunn, Kidderminster:—

Geo. Lazenby, Stockton-on-Tees	21,332 16 0
Roy & Harwood, Darlington	1,573 13 2
Craggs & Benson, Stockton	1,284 0 0
John Davison, Stockton	1,193 10 0
L. R. & W. Sturdy, Middleborough	1,173 0 0
Renshaw & Walker, Darlington	1,143 0 0
Thos. Dickinson, Saltburn	1,144 0 0
Adam White, Guisborough	1,139 8 8
John Perks, Stockton	1,102 5 0
* Reduced estimate (accepted) £1,067 ss. 10d.	

For building "The Casside Memorial Wing" to the Sunday School, Stillington, Durham. Mr. John Wm. Alexander, architect:—

Geo. Lazenby	2,350 0 0
Adam White	230 0 0
Craggs & Benson	275 0 0
Renshaw & Walker	249 2 10
J. R. & W. Sturdy	230 0 0
John Perks	215 0 0

For gasfittings, Horns public-house, Hackney-road:—

Biggs	2104 0 0
Stedman	112 6 6
Vaughan & Brown	86 10 0
Winn	75 0 0

For the erection of a cottage and office at Crown Wharf, Canning Town, for Messrs. W. W. Howard Roberts & Co. Mr. S. L. Walters, architect, Norgrove-buildings, Bishopsgate:—

Nadison	2,235 0 0
England	244 5 0
Barclay (accepted)	240 0 0

- MODELS AND SECTIONS ON VIEW. -
LONDON: LIVERPOOL: GLASGOW:
56 to 362, EUSTON ROAD. 6 and 8, HATTON GARDEN. 335, ARGYLE STREET.

INTERNATIONAL HEALTH EXHIBITION

Supplements to The Builder.

No. 7. JUNE 28, 1884.

ELECTRIC LIGHTING.



WHATEVER may have been the success or failure of the electric light in making its way as an illuminant for general purposes, its bitterest opponents must admit its complete suitability for large areas, and for decorative effects on an extensive scale. Much progress has been made since the Paris Exhibition of 1881, the dazzling brilliance of which will probably never be surpassed, but the result there was brought about merely by the massing together of a large number of very powerful lights, and no attention was paid to their effective disposition. This barbaric splendour of illumination was succeeded at the Crystal Palace by a quieter display, which enabled the rival merits of different systems to be estimated, but here also, quantity of light was the prime feature. It is not surprising that this should have been the case, for the enormous power of the electric light above all other forms of illumination was the prominent fact that first riveted the attention of the world upon the new invention. It soon became apparent, however, that mere quantity of light did not constitute the only, nor in fact the chief, element of superiority in the new illuminant, and the rapid progress made in the manufacture of incandescent lamps soon showed that these could be made subservient to the decorative treatment of interiors in a manner that was quite out of the reach of gas. Great improvements were visible at the Fisheries Exhibition last year, many of the features of which are retained in the present Health Exhibition, but results are achieved here far superior to anything previously attempted. There has been considerable delay in completing the installations, many of which are not yet in operation, and we have, therefore, postponed till now our notice of the different systems of electric lighting displayed at the exhibition, which we propose to examine from the artistic rather than the scientific point of view; that is, looking chiefly at the effectiveness of the illumination and not touching the question of the economic value of any particular lamp or machine. This depends upon the relation between the candle-power of the lamps and the horse-power used in producing it, and can only be determined by making a number of accurate scientific measurements of electro-motive force, conductivity of wires, and various other matters which are not strictly within the province of this journal. We would merely warn our readers that the lamp which burns most brightly and steadily is not necessarily the best adapted for general use, as it may take an extravagant amount of power to drive it properly. The non-appreciation of this fact has been one of the chief causes of the cloud which now hangs over electric lighting. The public have visited exhibitions and have seen lamps burning splendidly, and have been informed that the lamps can be made and sold at a profit for a comparatively small sum, and then after a company has been formed for manufacturing the lamps, it has more than once turned out that they are unsaleable because, though cheap in themselves, they are too expensive to work.

To commence with the arc light systems—the Jablochhoff, which was almost the first to show the capabilities of the electric light for street purposes, makes a very good show at the Exhibition. This system has been so often described that the Jablochhoff "candle" is probably the best known form of the arc light, but great improvements have been made since the first installation of this system on the Thames Embankment. The candles themselves

burn more steadily, and their slight irregularities are to a large extent neutralised by the use of the Trotter prismatic glass shade, which enormously enhances the effect of these lights. There are thirty lamps exhibited, each containing two candles, and they are arranged in the South Central Gallery, and in the southern parts of the West Central and the East Central galleries. These lamps are worked by four Gramme self-exciting dynamos of the Jablochhoff pattern, giving alternating currents. The Brush Company light up the East and West Annexes with sixteen of their improved arc lamps, which, in our opinion, show more conspicuously than any others the great improvement which has been made in this system of lighting during the past year. On former occasions we have frequently watched a number of Brush lamps and found not one of them steady for sixty consecutive seconds; but these lamps, either from alterations in their construction or from the use of better carbons, burn with a beautifully clear steady light, which is all that can be desired, and which enables all the objects displayed to be examined down to the smallest detail with the greatest ease and comfort. The East and West Quadrants, the East Arcade, the third-class dining-room, and the Exhibition-road entrance are lighted by forty Brush lamps of the same pattern by the Hammond Company. In each case the lamps are driven by one continuous current machine.

We have not space to describe in detail the various other arc lamps exhibited, some of which are of a new type, and we can only mention where they are to be found. The upper part of the West Central Gallery is lighted by ten of the British Electric Light Co.'s Brockie arc lamps; in the west corridor are eight lamps of Clark & Rowman's patent; the large Central Gallery is brilliantly illuminated by twenty-five Hockhausen lamps, and six of these are fixed at the head of the mast in the grounds, giving nominally a light of 18,000 candle power; but there seems to be some difficulty in getting their full power out of all these lamps, as on more than one occasion we have noticed them to be of very unequal brilliance. The East Gallery is lighted by forty Gùlcher lamps of about 350-400 candle power each (500 nominal), the distinguishing feature of which is that they are arranged similarly to incandescent lamps, viz., in parallel arc; that is to say, the current is not sent-through the lamps one after the other, as in the case with nearly all arc lamps, but each lamp forms a bridge across from the positive to the negative main. This arrangement allows of a much smaller electro-motive force at the machine.

The exterior of "Old London" is illuminated very effectively with five arc lamps of the Lea patent, which are concealed as far as possible from direct view, so that the effect of diffused moonlight is obtained, and this adds greatly to the picturesqueness of the surroundings of Mr. Birch's excellent reproduction. In the west gallery are displayed the admirable Pilsen arc lamps, thirty-nine in number, which are not surpassed for steadiness by any others; these are driven by three Schuckert dynamos. The conservatory next the Albert Hall is lighted by four Siemens's lamps of high candle power also arranged in parallel arc. The Sun Electric Light Company illuminate the cascades and part of the fountains, and also the centre of the dome of the Water Companies' Pavilion.

Among the lamps which we should have been glad to notice, as being new contributions, may be mentioned those of Messrs. Paterson & Cooper, Mr. Sennett, and Mr. Varley, who uses a new kind of flexible carbon, but none of these have yet been properly installed. There is probably very little to choose between the best speci-

mens of the various arc lamps, and those will be most commercially successful which can be made and worked the cheapest. Before leaving the subject of arc lighting we must express our regret that no one has attempted to show the adaptability of these lamps for interiors by means of reflection,—that is, by grouping two or three lamps, and concealing their direct rays, which could be thrown upwards upon white screens and then reflected down, thus giving a white, equally diffused, and agreeable light. Of course, a considerable quantity of light would be lost in this way, but probably not more than is now absorbed by the thick ground-glass globes which are required for the more powerful lights.

The incandescent lighting at the Exhibition must be pronounced a great success, and so many different methods of arranging the lamps are shown that a very good idea can be formed of the decorative effects attainable from numbers of small lights. In the Fine Arts Gallery, which forms the vestibule to the Exhibition Galleries, the effect of these small lamps in elaborate fittings can be studied, as Messrs. Verity & Sons have sent their large metal electrolier, on which ninety-nine Edison lamps are arranged; and immediately adjoining it is the glass electrolier of Messrs. Defries & Sons, with seventy-two Swan lamps. The former of these is an admirable specimen of metal workmanship, but it is too heavy and too ornate for its purpose, and we think, on the whole, the effect of the glass electrolier is preferable. We have, however, for some time held the opinion that elaborate fittings are a mistake with incandescent lamps, and the aspect of the large South Gallery fully bears out this opinion. Here not a penny has been spent on fittings, and the simplicity of the arrangement could not be exceeded. The roof of the gallery is supported by eighty curved trusses, each of which has thirteen struts with roughly-pointed ornamental ends. At each of these points is fixed one Swan lamp, so that there are altogether 1,040 in the gallery, and, when viewed from the top end, the effect of this long vista of lights following the curve of the roof is charming in the extreme. There is not the slightest glare, but a pleasant diffused light, with no shadows. In the Dining-rooms a different arrangement has been tried. Instead of fixing the lamps to the roof trusses they are attached to small pendants and are arranged in alternate groups of four Edison and single Swan lamps. This simple variation adds greatly to the general effect, which would probably have been somewhat monotonous if all the pendants had been alike. The lamps in the South Gallery are worked by two large alternating Siemens dynamos, and those in vestibules and dining-rooms by ten Edison dynamos, five of which are spare machines, in case of accident.

The dairies are illuminated by Mr. Crookes's incandescent lamps, variously arranged. In the Express Dairy some of the lamps are attached to pendants terminating in a ring of metal similar to gas star lights, and some are fixed round the woodwork of an elevated stand; in Welford's Dairy they are simply screwed up to the underside of the horizontal tie beam, but in both cases the effect is rather stiff. In the London & Provincial Dairy, the roof of which is like that of the South Gallery, the experiment has been tried of fixing the lamps not to the points of the struts, but to their sides, so that the lamps stand out horizontally. This seems to us a mistake, as if looked at on the side-away from the lamps the effect is by no means good. All these lamps are worked by four Gùlcher dynamos.

The Brush Company light the Vegetarian buffet with eighty incandescent lamps, but they

are attached to the arms of ungraceful brass electrolors, which are altogether too stiff and heavy for electric light fittings. The Woodhouse & Rawson lamps, which are to light the Aquarium and adjoining arcades, are not yet in position.

The Water Companies' Pavilion, which is octagonal on plan, with a domical roof, is well lighted, and here fittings are almost entirely dispensed with. In addition to the sun-lamp already mentioned, single incandescent lamps are placed along the ribs of the dome with differently-shaped shades, and the lower wall spaces have lamps enclosed in shades imitating various flowers, not altogether successfully. Four different kinds of lamp are in use here,—the Swan, the Woodhouse and Rawson, the Gatehouse,* and those of the Consolidated Company, and they are worked by one Oppermann machine.

The Doulton Trophy is lighted by twenty high-power lamps by the Gérard Company; and here, too, there are no fittings. Eight single lamps are arranged round the base of the dome, one each in the centre of the four arched entrances, and two each in the four corner rooms, the latter being so arranged that the contents of the rooms are brilliantly illuminated, but the lamps themselves are out of sight. This is a very successful installation, and the Gérard dynamo may be mentioned for its extreme compactness.

In the Prince of Wales' Pavilion a praise-worthy attempt has been made to show how the highest decorative effects can be obtained without elaborate fittings; but we cannot help thinking that if a little more thought and attention had been paid to this part of the work, a better result might have been obtained. In the ante-room there are three groups of eight lamps depending from a globe: there is ample light, but if the lamps had been more distributed, the effect would have been better. In the main reception-room a better arrangement has been adopted. The ceiling is divided into bays by flat ribs, and has plaster ornamental enrichments arranged so that the lamps can be attached to them. At each of the four intersections of the flat ribs is placed a group of three Swan lamps under an opalescent shade, and in the centre of the ceiling is a circular ring of sixteen lamps. These are undoubtedly too close together, and the effect would have been greatly improved if there were only eight in this ring, and the remainder distributed in the other bays of the ceiling. It is a great mistake to place these small incandescent lamps too close to each other in rooms where a distributed and not a condensed light is required. Nineteen similar lamps depend from the ceiling in the octagon room; and the private rooms, both of the Prince and of the Princess, are lighted by two groups of three lamps under one shade. Notwithstanding what we consider the defects in arrangement, the effect of these lamps is very pleasing, and it shows conclusively that with the electric light, a large outlay on fittings is neither necessary nor desirable.

On the whole, the lighting of this vast Exhibition is most excellent, and this is, doubtless, due to the fact that the illumination has been carried out under one management, that of Mr. W. D. Gooch, who has had the control of all the installations, and whose aim has evidently been not that any one exhibitor should throw his rivals into the shade, but that all the buildings should be perfectly lighted, and he is to be heartily congratulated on his success. The magnitude of the undertaking is almost appalling. Nearly 400 arc lights and between 5,000 and 6,000 incandescent lamps will be in use when the installations are all complete, and nearly 160 miles of insulated cable will be required, all of which is supplied by Henley's Telegraph Works Company. The engines are supplied by Messrs. Davey, Paxman, & Co., and over 1,000 indicated horse-power is employed.

METEOROLOGY.

THE Meteorological Section of the International Health Exhibition is very small, and does not approach to anything like the full and instructive exhibit it ought to have been, either as representing the power of meteorology as a science or its utility in the world; and the foreign countries are not at all represented, some of these (as, for example, Belgium) having instruments of exceeding interest, which it would have done great public service to have

* Fifty of these lamps will also be used in "Old London" when the installation is complete.

had displayed. Even less than a third of the East Corridor annexe is occupied by matters appertaining to meteorology; indeed, it is chiefly by diagrams on the walls that it puts in its appearance, and to which may be added a few cases of instruments by Casella, Negretti & Zambra, Dring & Fage, and some others, all well known for excellence. A very large portion of the building is occupied by the Anthropometric laboratory of Mr. Francis Galton, who has an attendant always present to take the sizes, weights, and strengths of all comers, and to test their eye-sight, sense of colour, and accuracy of judgment in mechanical division and form, and other details useful for tabulation for the purposes of biological research. There are also some very limited exhibits of astronomical and philosophical instruments, of which Mr. Latimer Clark's exquisite little window transit is exceedingly well worthy of attention. It is remarkably neat, and has the great practical advantage that the instrument may be lifted off its bearings, its index and vernier set to the required position in the light of the observer's room, and, on being dropped back again on to its bearings, the star sought for will be seen at the first observation. To bring the object exactly into the centre of the field of view there is provided a fine adjustment screw. It is designed for window use, but it may be set on a solid pedestal. The base-plate, which is circular, about 6 in. in diameter, is adjustable by levelling screws working upon an intervening spring after the plate has been firmly screwed in its place by a central screw. A cap is made to cover the bed-plate, as the transit instrument can be taken away when out of use, there being no trouble of fitting or unfitting, as the trunnions rest loose in the grooves of the bearings, and the tail support of the body, with prism inclosed, rests on the surface of the bed-plate as the trail of a gun rests on the ground.

The two chief meteorological exhibitors are the Meteorological Society of London and the Meteorological Department of the Board of Trade. The exhibit of the former consists of a typical climatological station fitted with the instruments used for meteorological purposes, and in working order, in the Garden grounds, near the Central Fountains; and observations are recorded and published daily. In the East Corridor Annexe they have a series of diagrams on the south wall giving a variety of information which is left to speak for itself, and to those who can understand it. One of these diagrams gives the highest and lowest temperatures attained at various geographical places alongside the scale of a gigantic drawing of a thermometer. The highest heats, commencing with Murzook 135° Fahr., and diminishing in regular order to Cooper's Creek 128°, Bagdad, Cairo, Adelaide respectively 120°, 117°, 110°, Sidney 108°, Jerusalem 104°, Greenwich 96°, Moscow 90°, and Falkland Islands 77°.

The lowest temperatures range from Barbadoes 75°, Singapore 68°, Lima 58°, Bombay 54°, Senegal 46°, Jerusalem 27°, Constantinople 15° above zero, Leh giving the zero, and then Greenwich leads for degrees below zero with minus 9°, Toronto 25°, Chicago 28°, Winnipeg 40°, Moscow 46°, Melville Island 54°, Bocołowski 62°, Fort Reliance 68°, Semipalatensk 75°, and Metchopansk minus 80° Fahr. There is another similar diagram giving the mean temperatures for a number of other places, varying from Ferozepore at 85° Fahr. down to 2° above zero for Melville Island. There is another diagram of considerable interest, one which depicts the deaths by bronchitis, fevers, diarrhoea, and deaths from all causes, in comparison with the temperatures in the metropolitan area for the period 1859 to 1861. The curves are drawn under the temperature divisions and are measurable by the per-centage scales at the sides. In the case of deaths by bronchitis they were at their maximum when the temperature was under 35° Fahr., and they were 25 per cent., diminishing to 20 per cent., with temperatures under 40°, and to 10 per cent. when the temperature was under 50°, decreasing still further as the temperature rises to midway between 65° and 70° when the deaths increase again up to 75° of temperature. The fever deaths vary but little from a nearly uniform line of from 10 to 15 per cent. Diarrhoea, on the contrary, is at zero with 35° of temperature, and the deaths continue to follow a nearly level line as far as 45° of temperature, commencing then to rise from 10 per cent. to 20 per cent., and thence going up sharply until at 75° the deaths reach 45 per

cent. Deaths from all causes continue from first to last very little above or below the level. We see hence clearly, that the diseases of the breathing organs and of the digestive organs are mainly caused by variations of temperatures, in the former case by diminished, and in the latter case by increased, temperature. The curve of the deaths from all causes rises up a little at each end, respectively representing the extremes of cold and of heat.

The diagrams shown by the Meteorological Department of the Board of Trade are coloured outlines of the British Isles, representative of the hot and cold temperatures of the sea around the coasts for each month in the year. So far as we know, there is no explanation of any kind appended to them, but the eye takes in at a glance some of the more curious features, one of which is the intensified colour of the red tint around the Foreland coast of Kent, in the estuary of the Severn, and in an indent of the west coast of Ireland towards Galway. The cause of this rise in the temperature of the sea in the summer months around Margate, Ramsgate, and Deal would seem to be due to the shallowness of the water, and it may possibly also be slightly intensified by the breaking out of submarine fresh-water springs from the fissures of the geological strata of white chalk which there forms the sea-bed. The estuary of the Severn effect may be perhaps due to the fresh-water conditions contributed by the river; but the Irish incident appears to be of more erratic origin, as it is not persistent in consecutive months. The local intensifications of the blue colour which represent unusual degrees of cold are also very curious, but their explanation is not easy without assistance.

The sunshine indicators and records, shown by Mr. Lecky, are interesting and instructive, and he ought to have due credit for providing printed sheets of explanation for the acceptance of the public. The records are taken from the station of Mr. Dymond, at Apley Guise, in Bedfordshire, with a sunshine recorder fitted with Professor Stokes's sodical frame, and which station was selected as being a central one for the South of England. The number of hours during which the sun might be visible is:—January, 259; February, 279; March, 367; April, 415; May, 482; June, 494; July, 497; August, 450; September, 377; October, 325; November, 265; December, 243 hours. The per-centages of sunshine for the past year were January, 21.6; February, 28.2; March, 37.6; April, 33.4; May, 35.6; June, 36.6; July, 27.4; August, 39.7; September, 32.5; October, 25.2; November, 33.1; and December, 9.8 per cent. The per-centages are given respectively for the three years 1881, 1882, and 1883, the principal features in the general results coming out that last December the sunshine was less than 10 per cent., and that only in May, 1882, did it exceed 50 per cent.; whilst in the year 1881 there was, on the whole, only a trifle in excess of one-third of the total possible amount of sunshine, and both in 1882 and 1883 the proportion was less than this.

The Kew Observatory contents itself with exhibiting a certificate of test of a clinical thermometer,—a commercial rather than a scientific appearance, as some might think, for such an occasion.

Amongst the instrument-makers' exhibits, Casella has a very fine anemometer and recording cylinder; and Tisley & Co., Denton, Stanley, Watson, Frost, and Cetti have small but very good displays of the special articles for which each has a reputation. The first-named firm, we believe, have supplied the measuring and testing instruments for Mr. Galton's anthropological measurements and tests.

THE DAIRIES.

THE dairies and bakeries form two of the most important features in the Exhibition; and although the three large exhibits of the latter class are not so attractive as the three principal dairy displays, the practical interest between the two is fairly well balanced. Both the bread-making and milk and butter purveying trades of the metropolis appear to be undergoing a marked change at the present time. Neither of these industries has been to a great extent affected by the great co-operative movement of the last few years; but the advantages of concentration of management and capital have none the less made themselves felt, and have been turned to good account by those possessing the foresight and enterprise to profit by

this field of industry. A few years ago the local baker and the local milkman "served" their immediate district without fear of opposition excepting from neighbouring tradesmen. Now such firms as Messrs. Hill & Sons amongst the bakers send their produce all over the metropolis, from Stratford in the east to Hammersmith in the west, or between Hornsey and Croydon in a north and south line. In the same way the carts of many of the large retail dairymen travel over a wide area in our local geography; and from the uniform excellence of the goods they supply, and the punctuality with which they carry out their engagements, seem as if they would all but exterminate the smaller shops.

Dairy produce may be divided into milk, cream, butter, and cheese. Milk is generally regarded as a model food, and no doubt if our stomachs could be governed by the dictum of laboratory research, a diet of milk alone would leave little to be desired. Our digestive organs, however, give a far more subtle analysis than can be obtained by the most elaborate scientific investigation, and as a matter of fact a large number of grown people find raw milk a very indigestible food. This is altogether contrary to popular belief, for it is argued that if a newly-born infant can assimilate milk, surely an adult can do so too. In some respects, however, an infant may be stronger than even a grown man, and this would appear to be the case with regard to the digestion of milk. It will be remembered, however, that human milk, the natural food of infants, contains less solid matter, especially casein and other albuminoids, than does that of cows, although the quantity of milk sugar (lactose) is greater in the former by about 1.8 per cent. It is for this reason that water and sugar are added to the cow's milk used in the artificial feeding of infants. So far as can be ascertained, very little adulteration takes place in milk in the present day compared to that which was practised before legislation made dishonesty in this direction dangerous, or at least unprofitable. The belief that calves' brains and chalk are used for this purpose may be considered entirely unfounded; the only adulteration now practised being the comparatively harmless one, if the water be pure,—of the pump. The milk supply may, however, be the means of spreading disease to a far greater extent than would arise from any adulteration by noxious ingredients. Milk, in common with like fatty matters, has the power of absorbing emanations from other substances, and if allowed to remain in proximity to sewer gas, will become a most unwholesome, not to say poisonous, compound. The germs of disease may also be introduced into milk through the agency of the water used in washing the various dairy utensils. The subject is an important one, but requires no further mention here, as it has been exhaustively treated in a conference recently held at the Exhibition.

Butter is the item of second importance in dairy economy. When pure it is more especially a heat-giving article of diet, the calorific principles being the most important. It differs in this respect from its sister product, cheese. In the latter the essential constituent is casein, a proteid or flesh-forming principle of food. Of course the richer cheeses, more especially the fancy cream cheeses which have become so popular of late, contain a great deal of fatty matter, and even Cheddar or Gloucester will have about equal quantities of fat and casein in their composition, whilst in a poor skim-milk cheese the proportion of fat will, perhaps, not be above 6 per cent. Up to the present, however, there is, we believe, no example of cheese-making to be seen in the Exhibition, and we will not, therefore, enlarge on this important branch of industry, which it may be remarked, in passing, has been taken from us to so great an extent of late years by the better organisation of other countries.

A good deal has been said and written lately about the adulteration of butter, and certainly not without cause. When it is remembered that it requires from twenty to twenty-three pints of milk to produce one pound of butter it would seem reasonable to suspect that the vast quantities of produce sold under the latter title cannot all come from the cow. In a previous notice of the Exhibition (p. 736, ante) we made brief mention of Messrs. John Knight & Son's exhibit. It may seem invincible to treat of the productions of this firm under

the present heading, yet some of the butter-shop keepers have so successfully obliterated the distinctions that lie between real and artificial butter, that perhaps we may also be excused for a little mixing of the two subjects. It is but fair, however, to the dairy firms we are about to mention to say that such high-class produce as they have on sale at their stands could not be obtained by any manufacturing process other than the simple churning of cream. Messrs. Knight & Sons are a very respectable and old-established firm of soap-boilers, their "Yellow Primrose" having been for generations literally a household word. They now very frankly announce themselves as makers of oleo-margarine, and take some pride in the fact that they can produce as much as twenty tons of this substance in a week. Animal fat, from which oleo-margarine is prepared, is composed of the three elements, carbon, oxygen, and hydrogen, and these are combined in the principles oleine, margarine, and stearine. The latter is more abundantly present in mutton than in beef fat, and for this reason, as will presently appear, beef suet is more suitable for making into oleo-margarine than the fat of sheep. Stearine remains solid at much higher temperature than oleine or margarine, and this renders it an undesirable article for the butterine manufacturers' use. It is, therefore, extracted from the fat operated upon, and ultimately appears in domestic life in the form of candles. The remaining oleo-margarine is the raw material from which the butterine manufacturer makes his finished article. Owing to the different temperatures at which the stearine and oleo-margarine become solid, the separation is easily effected. The fat is melted, and allowed to cool gradually, the stearine being taken out as soon as it becomes solid, and while the remaining two constituents are yet liquid. These latter solidify at a temperature of about 60° Fahr. The "dairy" processes by which oleo-margarine becomes butterine have never, so far as we are aware, been made fully public, but the greatest art lies in the favouring. This is variously carried out, either by means of chemicals, or by whys obtained from the churning of real butter, and more or less resembles that of the genuine articles, according to the skill of the operator or the scientific attainments of the presiding chemist. It should be remarked, however, that oleo-margarine is a wholesome article of diet in itself, supposing it be prepared from fresh wholesome fat, such as Messrs. Knight & Sons state they use. It is probably equally effective as a heat-producing food as the best butter, and no doubt quite as nutritious, excepting that it is not so palatable. The zest with which food is eaten has no small influence on the good effect it produces.

To return, however, to dairy produce proper, as represented in the Exhibition, we find that the three principal stands are those of Messrs. Welford & Sons, Limited, whose chief office is in Elgin-road, Maida-valle; the London and Provincial Dairy Company (Messrs. Fuller & Watts), chief office, 4, Halkin-street West, Belgrave-square; and the Express Dairy Company, Limited, of Bloomsbury Mansions. Each of these firms contributes a complete model dairy, in which the whole operation of producing milk and butter can be carried out in a practical form. Indeed, as a matter of fact, the cows which are kept on the premises supply the milk, or part of it, which is retailed in the Exhibition for the refreshment of visitors, or from which the cream is taken for conversion into butter. All these three dairies are placed next to each other, and are generally arranged in a somewhat similar manner: light structures, opening into the great south gallery, having been erected for the purpose. Messrs. Welford & Sons' display is the first that is reached when coming from the principal entrance. The gallery frontage is picturesquely arranged in the old English style, and in itself is an attractive feature in this part of the Exhibition. The cows are placed in a shed at the back of the stand, or perhaps we should rather say premises, considering the extent of the display. They consist of Jerseys, Alderneys, and Scotch-poll. A cross between an Alderney and a short-horn is also shown, and is found to be a very good breed for general work, as it will give an abundance of high quality milk. In the dairy portion of the show the first thing to claim attention is Lawrence's patent capillary refrigerator. This consists of a series of metal tubes, through which a stream of cold water ascends, whilst the milk to be operated upon

trickles downwards over the corrugated surface formed by the superposed tubes. It is a thoroughly established fact that milk which is allowed to cool gradually will not keep for so long a time as that which is suddenly cooled. In ordinary weather the latter will remain fresh for two days. So far as we are aware the reason for this has never been ascertained, but, nevertheless, the fact remains. Milk passed through a refrigerating process directly it is taken from the cow loses the peculiar animal smell so often noticed in that obtained from small provincial dairies, where modern appliances have not been introduced. For making butter, the milk which is taken from the refrigerator, or that which is brought in from the country, is poured into a metal tank placed about 7 ft. or 8 ft. above the floor. As the railway churns in which it is carried are somewhat heavy for hand manipulation a small power lift is provided. This raises the churn and automatically tilts its contents into the tank, and then returns the empty churn to the floor. From this tank the milk is run into one of De Laval's patent centrifugal cream separators; for, since this apparatus was exhibited at the great Kilburn show in 1879, the practice of letting milk stand until the cream rises has become quite obsolete, so far as the best-conducted butter-making establishments are concerned. De Laval's apparatus consists of a vertical shaft mounted upon a cast-iron standard, and driven by a small grooved pulley at the lower end. On the top of this shaft there is attached a receptacle into which the milk is run in a continuous stream. It falls upon a "spreader" placed in the centre of the bottom of the vessel. This spreader is composed of a small cone standing in a cup-like inclosure. The apparatus is caused to revolve at the remarkably high speed of 6,500 revolutions per minute, and the lighter constituents of the milk which form the cream remain in the centre, whilst the heavier parts, by their superior momentum due to the centrifugal force, find their way to the outer part of the revolving vessel, by way of a small pipe leading from the cup mentioned. A tube leads from that part of the vessel to which the skim milk is forced, and up this the latter passes into an outer casing, and thence is drawn off into suitable receptacles. The cream remains in the form of an annular core, and rises until it reaches a small aperture, through which it escapes into a space provided for it, and thence is drawn off for use. Messrs. Welford have two of these machines at work at the Exhibition, each capable of treating sixty gallons of milk per hour. We understand that by the use of this separator, out of every thirty gallons of milk an additional 3 lb. of butter will be obtained over that reached when hand-skimming is followed. It is also claimed that the cream got by centrifugal separation is far superior to that resulting from hand-skimming. This, no doubt, is in most respects true, and probably so far as butter-making is concerned is entirely so; but by hand-skimming the globules of the cream do not get broken up in the same way that they do in the machine, and this has a considerable influence on the flavour of cream itself. For making butter, Messrs. Welford & Sons have three churns at work in the Exhibition. The principal of these is Taylor's eccentric churn. This consists of an octagonal oaken barrel, mounted in a suitable frame, and supported at each end by two pins attached to the heads. These are both placed eccentrically to the ends of the churn, and are not opposite each other, so that a line between them would be oblique to the axis of the barrel. In this way a peculiar compound motion is obtained, which is very effective in making the butter come. In the interior of the barrel projecting points are fixed, which help to break the butter so that it does not require as much working after being taken out. The churn shown at work is known as No. 5, and will turn out 40 lb. at one churning of twenty minutes. A larger churn of this description, which will make 150 lb. of butter at one operation, is also shown. There is also on this stand a churn of the same kind, excepting that it is made entirely of marble. The advantage claimed for this is that the marble being a non-conductor of heat, the contents of the churns are kept at a uniform temperature throughout the process of making the butter. This is a point of great importance. In making butter the temperature of the cream should be as nearly as possible 62 degrees Fahr. If the

heat is greater the butter will be soft and will lose the delicate flavour that it should have when made from good cream, and properly churned. On the other hand, if the temperature be too low bad effects will follow through the work being unduly prolonged. Ice or hot water is sometimes put into the churn and mixed with the cream. This, however, should never be done, but these substances should be contained in a suitable metal chamber so as not to be brought in contact with the churning. This is the system followed by Messrs. Welford & Sons. A Bradford diaphragm churn is also shown at work on this stand. It is simply an octagonal barrel hung horizontally in a suitable frame. The diaphragm is removable, and is composed of three or four slots placed at varying angles to each other in a frame. The motion is obtained by friction-wheels, on which the pins rest that support the barrel. The churn shown is worked by hand, and has a capacity of 28 lb. of butter per churning. An older description of machine is Bradford's Cotswold churn, which is also shown at work. It is simply an oblong box hung in a double X frame. There is nothing inside to break up the butter, the ends acting as beaters. The motion is obtained by hand.

After the butter is taken from the churn it is broken up by one of the many kinds of mechanical butter-workers used. In order to preserve the butter, it is necessary that every particle of whey should be expelled, otherwise fermentation will be set up and lead to that disagreeable cheese-like flavour which is sometimes met with. The old plan was to work the butter by hand, but this is a long and tedious operation, and mechanical kneading is now all but universal in English dairies of any importance, as it has long been amongst those of the Continent. The butter-workers are, as we have said, of many patterns. The principal ones, shown by Messrs. Welford, is "Bradford's Albany." A flat tray is mounted on a stand, and sliding on the edges of this tray is a frame in which a grooved roller is made to revolve by hand. In this way the butter is pressed out into a fluted layer and is effectually broken up. When not in use the roller can be dismantled, and the tray reversed so as to form a washing-up table. Considerable importance is attached by this firm to a method of hardening butter, which has been introduced from Denmark. The process is carried out by means of certain boxes which have circular holes bored in the bottom, and above this is a wooden grating on which the butter is placed after having been wrapped in cloths. A leaden compartment is placed in the upper part of the box, and this is packed with ice. The cold air circulates through the box, and so hardens the butter. The drainage of this model dairy is arranged on the same principle as that followed on the actual working establishments of the firm. So far as we could judge, there is nothing special about this requiring description here. It appeared to be simply an ordinary well-devised arrangement by which the connexion between the drain and sewer is broken outside. The point is none the less one of great importance in the hygiene of dairy practice, for reasons before referred to.

Adjoining Messrs. Welford's dairy is the excellent display of the London and Provincial Dairy Company. This firm obtains its supplies from its own farms, which are situated near Devizes, in what is reputed to be the best part of the Wiltshire district. Many of the machines shown on this stand are similar to those already referred to, and further description of them will therefore be unnecessary; for instance, De Laval's centrifugal cream-separator, and some other appliances of this nature, are in operation. The whole is driven by a 2½-h.p. Otto gas-engine; one of Messrs. J. & E. Hall's cold-air machines is also shown, and can be applied for the various refrigerating purposes so necessary in dairy practice. A Botts capillary milk refrigerator is used. This is in principle similar to the Lawrence apparatus before described, but is fitted with opening sides so that the interior of the tubes can be examined should the necessity for doing so arise. A large Hathaway's power churn is the principal one in use. This is a cylindrical barrel placed horizontally and fitted with diagonal beaters inside. A very beautifully-made working model fitted with glass ends, so that the operation can be seen, is also shown. A second churn here at work is by Hathaway. It consists of an oblong box placed above a suitable frame, and supported

in the centre by a vertical arm, which is connected at its lower end to a crank. By rotating the latter the churn rises and falls. At one end the churn is also connected directly to a crank the turning of which gives a horizontal movement to the box, the vertical arm pivoting on the box so as to allow of this action. In this way a compound movement is obtained, which is very effective in making the butter "come." We are informed that when running at 150 revolutions the churning only takes three minutes with this machine. The apparatus shown is power-driven, and will turn out 20 lb. at one operation. Several hand butter-workers are shown, amongst them the "Albany" before mentioned. A power-driven machine is also working. This is a Bradford's "Springfield," in which a circular table rotates under a fluted cornice-roller which also rotates. In this way the butter works upwards by a differential motion, and is very effectually broken. A great many smaller dairy appliances are also at work on this stand, but our space will not allow us to carry the subject further. To those interested in such matters, however, they are well worth inspection.

What bids fair to be the most interesting feature in this display is the cheese-making plant, which, unfortunately, is not yet complete. Possibly we may have an opportunity of returning to the subject when Messrs. Fuller & Watts get the machines in working order.

The third large display is that of the Express Dairy Company. The most noticeable features in this stand are the two large Hamburg centrifugal cream-separators. In these the separating vessel is vertical in place of being horizontal, as in De Laval's apparatus. The diameter is greater in the former than in the latter, and a higher peripheral speed is therefore obtained with a fewer number of revolutions, the machine only making 1,500 turns per minute. The extraction of the cream is effected in a manner which appears somewhat curious at first sight. The central part of the casing of the revolving vessel is cut away, and as the machine spins round at the very high speed the milk and cream are naturally thrown violently outwards by centrifugal force, leaving a circular space in the centre. A pipe is brought forward from the outside and inserted through the hole where the casing is cut away, being thus brought in contact with the inside of the revolving annulus of milk and cream,—the cream, of course, occupying the more central part of the annulus, on account of its lower specific gravity, as already mentioned in describing De Laval's machine. In this way a flow of cream is obtained through the pipe, and is greater or less according to the distance the pipe is thrust forward. The end of the pipe is cut in a plane diagonally to its axis, and the lip so formed directs the cream into the bore. The operation is exactly the same as that of turning out a hollow piece of work in a lathe, the pipe representing the tool. So great is the compressing force generated by the centrifugal action, and so rapidly do these machines revolve, that even so smooth a substance as cream exerts a considerable abrading power, such as, it is said, would soon take the skin of the end of one's finger if pressed against the surface. On this stand are many other dairy appliances, several of which we have already described.

THE PRESERVATION OF FOOD.

In a former notice we promised to give a fuller account of the cold air machinery exhibited by Messrs. J. & E. Hall in the "Machinery in Motion" Department. Messrs. Hall show two of their smaller-sized cold-air machines, adapted for preserving all kinds of perishable articles of food by means of cold dry air only, and entirely without the aid of any chemicals or gases. The machines are connected with a cold store on a small scale, in which Australian and New Zealand mutton is stored to demonstrate their practical working. The cold is produced by compressing the air in one cylinder, and this causes it to become very hot; it is therefore passed over a number of tubes in which cold water is circulated, but the water is not allowed to come in contact with the air. The temperature of the air is thus reduced to nearly that of the water. It is then admitted to another cylinder, in which it expands, and whilst helping to work the machine, it becomes very cold, and is delivered perfectly dry into the cold store. Messrs. Hall make six different sizes of machines,

and the temperature of the air delivered varies from 30° below zero Fahr. for the small ones to 100° below zero for the largest ones. We are informed that, owing to the perfection to which this class of machinery has been brought, it is now possible to obtain prime mutton from Australia and New Zealand for 7d. or 8d. per pound. Their sphere of usefulness is, however, by no means limited to the foreign dead meat trade; they are employed for the preservation of fish, poultry, milk, butter, fruit, vegetables, &c.; also in connexion with bacon-curing, chocolate-making, and for a variety of other purposes. Messrs. Hall have also fitted a large number of passenger steamers with these machines for preserving the food, cooling the potables, and making ice. The special features about the two machines exhibited are their extreme compactness and noiseless working. They are fixed vertically for convenience sake, but can equally well be placed horizontally. The larger of the two delivers from 5,000 to 7,000 cubic feet of air per hour at a temperature of 75 deg. below zero, according to the speed at which it is worked, and will preserve eighty-five tons of meat or its equivalent in other food. The smaller one delivers 2,000 cubic feet of air per hour at a temperature of 35 deg. below zero Fahr., and will preserve twenty tons of meat, or its equivalent in other food. Messrs. Hall also exhibit in practical working a still smaller machine and a cold storage-chamber in connexion with the London and Provincial Dairies Co., South Gallery, for preserving dairy produce.

BATHS, LAVATORIES, DRAINAGE, WATER-FITTINGS, &c.

CONTINUING our notice of this class of exhibits, we may this week commence by directing our readers' special attention to the exhibits (Stand 409, Central Gallery) of Messrs. Joseph Cliff & Sons, of Wortley, Leeds, and more particularly to this firm's "Imperial" porcelain bath, which for excellence of finish and for lightness and strength is not excelled, if it is even approached, by any other exhibit of the kind in the collection. One of these baths is shown lined with white enamel, and another lined with pink. A pleasing effect is obtained by an inlaid tile border, cemented in after the bath has been fired, a groove or channel being left near the top edge of the bath for their insertion. Where the tiles are well chosen, this may be made the means of a very effective decoration. Materials for bath room wallings, in the shape of majolica and glazed brick, are shown by the same exhibitors, who have, indeed, fitted up what may be called a model bath-room and kitchen, for the purpose of showing the action of their appliances. If happiness be in any degree dependent upon the ease and facility with which one's work can be done (as it undoubtedly is), happy should be the house-wife or hand-maid whose kitchen or scullery is provided with one or another of the white glazed fire-clay sinks or washing-troughs shown by these exhibitors. These sinks are sure to be appreciated wherever they are used, for they are exceedingly cleanly and very convenient, their merits being strongly recognised by our cousins on the other side of the Atlantic, who import them and mount them in the manner shown at the stand. Lavatory basins, a white glazed fire-clay hospital slop-sink, a very good and useful house-maid's slop-sink, and a porcelain sitz bath, go to make up what is, with the decorative and constructive majolica already noticed, one of the most useful exhibits in this section of the Exhibition.

At Stand 375 in the South Central Gallery, Messrs. W. Phillips & Son, of Baker-street, exhibit a couple of large models showing at a glance the necessary arrangements for the easy inspection and perfect disconnection of the drains of a house. One of the models is that of large premises in Oxford-street where the business of a pork-butcher is carried on, and where it was necessary to take special means for the interception of fat and other matters. The exhibitors' patent "Simplex" sewer-gas intercepting trap is a direct cleansing syphon trap of special form, with inspection-cap through which it is possible for a man to put his hand right into the bottom of the bend or dip of the trap. The patent grease-gully shown by this firm is well calculated to achieve the end aimed at, and is, we believe, used on the premises just mentioned. The other model shows the drainage

arrangements of a large house at Notting-hill, as carried out by the exhibitors under the direction of Mr. Edward Vigore, architect. As instructive examples of the dangers of bad plumbing and unventilated soil-pipes, Messrs. Phillips & Son show a number of old D-traps, cut open and shown to be clogged up with foul deposit. Also a number of pieces of lead soil-pipe with numbers of holes eaten through them by sewer gas, plainly emphasising the oft-repeated injunction, "Ventilate your soil-pipes!" It may also be mentioned that Messrs. Phillips's stand is decorated by themselves with non-poisonous materials, which they claim to be durable, washable, and non-infectious.

Messrs. Beck & Co., at Stand 541, in the Eastern Annexe, exhibit, besides the sanitary fittings and brasswork already noticed, Bell's patent screw-down double-valve gun-metal stop-cocks, which have been specially designed to meet the requirements of the metropolitan water companies under the Board of Trade regulations. They have a full water-way, and when it is necessary to discontinue the supply to any house, the cover can be unscrewed and the upper valve taken out (without shutting-down and emptying the main); the cover can then be replaced and the upper valve returned to the engineer's office with the "cutting-off order," as a proof that the work has been carried out. The bottom valve being closed by the pressure of the water, it is impossible to obtain any water until the upper valve has been replaced. The screw-spindle does not rise when the cock is opened, and being fitted with a guard, grit is prevented from getting to the working parts. This stop-cock is well worth attention, as are Bell's patent screw-down gun-metal bib-cocks.

Mr. G. Clutterbuck (Stand 572, Eastern Annexe) shows his patent "simple syphon" water-waste preventer, which has no valves, leather, or rubber washers, which appears to be effective and likely to stand wear and tear.

Mr. Francis Botting, of 6, Baker-street (Stand 659, East Arcade), exhibits models and full-size details of the means taken by him for disconnecting water-closets and waste-pipes from direct communication with the main soil-pipe, so dispensing with branch ventilating-pipes. The appliance by which this end is sought to be attained (and, it is claimed, with success) is known as Durran's patent valve. It is the invention of an architect, and consists of a valve so arranged that it shuts without any mechanism, and opens with the slightest flush of water, allowing every drop from the branch soil or waste pipe to drain away. Where this arrangement is applied, it is not thought necessary by the exhibitor to fix traps under valve-closets, whereby a better flush can be obtained than when the water has to pass a trap. The main soil-pipe is, of course, ventilated. Over the patent valve (the principle of which is, in short, that of the tide-flap of a sewer) is an access door for inspection. It is claimed by the exhibitor that with the use of this patent valve attached to each branch or waste pipe discharging into the main soil-pipe, the latter is sufficient for all purposes,—for closets, baths, and lavatories. The same exhibitor's air-tight cover for inspection-pits, his cast-iron accessible trap, and his fresh-air inlets for the ventilation of drains, have been noticed by us with commendation on a previous occasion.

At Stand 1,234 of East Central Gallery A, Messrs. Horn & Son exhibit Homeword's Improved Water-waste Preventer for water-closets. In this apparatus, the raising of what is, apparently, a kind of spindle-valve at one end of the syphon, admits water at that part, and the flow of this water causing a vacuum, the syphon becomes charged from the cistern at the other end, and the cistern is rapidly emptied. It is claimed that by this invention a waste-preventing cistern containing three gallons of water supplied from a cistern standing only 2 ft. above the other, through a 3 in. ball-valve, and discharged through a 1½ in. valve, can be emptied and refilled in one minute.

Messrs. G. & W. Hughes exhibit, at Stand 996, near the main entrance, a drawing of an arrangement comprising a cistern for giving a full supply of filtered water for drinking and culinary purposes; also an apparatus for supplying disinfectants to water-closets.

Messrs. Lawson & Donkin (Stand 545 in the East Annexe) forward us some particulars of their patent "combination" earth and water closet, briefly referred to by us a fortnight ago.

The point which they have endeavoured to achieve in it is the perfect separation of the solid from the liquid excreta, in the first instance, so that water and earth may each be used for its own legitimate purpose, without either being mixed with the other: the natural advantages of each medium being distinctly applied and brought into action by one movement and one apparatus, being in all other respects similar to the best kinds of water-closets now in ordinary use. These results they claim to obtain, primarily, by a basin so divided as to form a perfectly-trapped urinal in front, while the larger portion in the rear is provided with a pan, which receives the faeces in the usual way, but charged with earth instead of water. The action controlling the supply of earth is very simple, and automatic, being effected by substituting their patent earth-valve for the present water valve. The water is supplied and discharged from the urinal by raising a handle at the side, in the ordinary way; and the urine alone is thus conducted to the drain, but the conducting-pipe, containing fluid only, can be made entirely independent of, and disconnected with them. The faeces, being kept separate, are deposited in earth (or other deodorising material), and afterwards covered by it through the automatic action of the closet, when it is ultimately conveyed outside by a vertical soil-pipe, and discharged into a receiver constructed for the purpose. It will, of course, be necessary to make proper provision for its constant and regular removal.

Before leaving the East Annexe, we may point out that here are to be seen and tested a great variety of disinfectants, the best-known of which, such as "Sanitas," carbolic acid, and Jeyes's Fluid, are too well established in popular favour to need commendation. We have had no opportunity, however, of examining or testing the new-comers (if such they all are) in this branch of sanitation, but we may briefly enumerate them. "Thymo-Cresol" is the name of a compound exhibited by Messrs. Neas & Co., of Darlington. The New Carbolic Sanitary Company show the Government Pink Carbolic Powder. "Pixene" is the name of a new antiseptic derived from pine tar. Hartin's Crimston Salt, and Doughty & Co.'s "Eucalyptozone" are two other compounds which seem to merit attention.

Before concluding this notice we will return to East Central Gallery C to make mention of those exhibits in this gallery which we were unable to refer to last week.

Mr. Thomas Maccall, M.D., of Brixton, exhibits (973) the "Matlock" domestic portable Turkish bath, which claims to be a complete Turkish bath on a small scale, with efficient ventilation.

At Stand 974, Messrs. B. Finch & Co., of High Holborn, exhibit one or two specialties in the way of lavatories with trigger-motion and plug outlets, suitable for schools and public institutions. We may also mention the "School Board" tip-up lavatory, with extra-strong basins and pivot supply, and the new jet-valve lavatory, for use in industrial schools, with the view of preventing the spread of that scourge of such establishments, ophthalmia. In the case of lavatories on the jet principle hitherto provided for such institutions at the request of the Education Department, it has been customary to carry a length of iron pipe along and about 1 ft. 6 in. or 2 ft. above a continuous trough, to each side of which the children have access. The pipe is perforated on each side with a number of holes, through which the water runs in the form of jets into the trough below. The children wash their hands and faces by means of these jets, which are all running at once, no matter how few children are washing at one time. This arrangement, of course, entails serious waste of water, which is prevented by the use of the new jet valves used at intervals (one for each scholar) on the underside of the continuous pipe. The valve is merely a simple adaptation of the ordinary spindle-valve, and is instantaneously opened and closed. This lavatory should not be missed by visitors interested in the management of industrial and similar schools. Another specialty at this stand is a seat-action wash-out closet, with good flush and after-flush. This closet appears to be well adapted for use in lunatic asylums and railway stations, and in all situations where simplicity and reliability of automatic action are essential.

Stand 975 is that of the well-known firm of

Benham & Sons, of Wigmore-street, who exhibit some very excellent baths and lavatory fittings, a portable hospital bath, and an improved slop-sink.

The remainder of the exhibits in East Central Gallery C consist of soaps, sponges, towels, brushes, and kindred "companions of the bath."

Possibly there are in other parts of the Exhibition some exhibits in the form of baths and fittings which should be found in this Gallery if the distribution of the exhibits were in accordance with their classification; if so, they will be noticed on a future occasion.

WOOD-WORKING MACHINERY EXHIBITS AND APPLIANCES.

In the Western Gallery and its annexes, where the "Machinery in Motion" is principally located, in connexion with the various groups of exhibits, we were led to expect that there would be a fair representation of wood-working machines, both steam-power and hand, but we were surprised to find scarcely any display at all, or less than could be counted on the fingers of one hand. On inquiry, there were some reasons forthcoming why wood-working machinery is so badly represented in the Health Exhibition, but these reasons were not convincing. It would seem that some of the chief manufacturers applied for space, but failed in obtaining it, or the amount they required, hence the paucity of the display. Both in connexion with the building and fitting of the dwelling and the workshop, not to speak of other structures, the operations and outcome of wood-working, steam and hand-power machines form no unimportant part, and certainly woodwork, which includes timber, the raw material as applied to articles of carpentry, joinery, and furniture, has a good deal to do with sound and healthy construction. Timber or wood, seasoned or unseasoned, is subject to various processes in the present day to protect it from dry-rot, the influence of water and damp soil, and the ravages of wood-boring beetles. Again, the utilisation of machinery in performing heavy operations in preparing carpentry, joinery, and cabinet work, in sawing, mortising, tenoning, moulding, &c., has lightened the labour of our skilled artisans.

Of wood-working machines proper, there are two in the Western Arcade, Stands 1,200 and 1,201 respectively. That of the former, Mr. E. S. Hindley, Queen Victoria-street, E.C., has on view a circular saw-bench, with rising and falling spindle for the grooving of flooring boards, &c. This machine can be otherwise utilised by being fitted with band-saw and block for striking mouldings, both ordinary and those in relation to the handrails of stairs. A tenoning apparatus can also be affixed for the usual run of doors and house work. This composite machine, as we may call it, performs its work cleanly and with fair efficiency. The second stand, that of Messrs. Anderson & Hunting, Newcastle-on-Tyne, contains a dove-tailing and moulding machine for performing both kinds of work in variety. The specimens of dove-tailing and circular mouldings done by this machine, on the score of finish, are excellent. As regards dove-tailing, we gave some time since, in these pages, a review of some of the principal machines introduced for cutting various kinds of dovetails, ordinary and secret, or on the mitre. The Tighe Hamilton dovetailer, called after the gentleman who spent several years in inventing and perfecting it, was a most ingenious machine, applicable for steam and hand power. It was capable of executing dovetails, large and small, and in great variety. A small circular saw when set in motion had communicated to it a swaying action. The pins were cleanly and accurately cut, and the tails or opens were formed, not by the cutting out of bits of the wood, but by the rotary and swaying motion of the saw, which reduced the wood of the tail spaces to dust, and thus no cutting out by the chisel was required. Messrs. Anderson & Hunting claim that their dovetailing machine possesses advantages over others for this class of work, the dovetail being, in this instance, formed by a single cutter, the tables for carrying the work being entirely automatic. The dovetail produced is known as the "lap," the pin and tail, or space, being exactly the same size. The cutter is fixed in a vertical spindle; it can also be arranged in a spindle to be applied eccentrically, to give the necessary clearance for producing the exact space needed to suit the pins. The conversion

of the machine in a few moments into a single irregular or circular moulding machine for moulding, tonguing, grooving, rebating, beveling, stop-chamfering, and other operations, shows its great adaptability to various classes of joinery work. Although we can speak favourably of this composite machine and its usefulness, we must also say, at the same time, that all composite wood-working machines have their drawbacks; but, as some persons will have machines capable of performing a variety of operations, they must be prepared for the defects that wear and tear develop in their use. We might have added, in respect of Mr. Hindley's machines first mentioned, that in his circular saw-bench, with boring-table, the fence has a very good screw adjustment, and can be inclined at any angle for bevel cutting, or can be immediately thrown over, leaving the table clear for cross-cutting. The carrier-plate runs in a groove, and can be used for mitring, &c., as well as cross-cutting. There is a vertical adjustment in the boring-table, so that holes can be bored at any angle. There is no display of carpenter's, joiner's, or other wood-worker's hand, bench, or workshop tools in the Western Gallery or its adjuncts, as far as we could see, the only appliances and tools of these kinds we know of being those described last week in connexion with the exhibits in the basement story of the new building of the City and Guilds of London Institute. It will not be out of place to say here that for several years American building and other workshops have been in advance of us in respect to improved carpenter's, joiner's, and other wood-worker's hand or bench tools, and thus, though the skilled workman in the United States may not work as hard as the British workman, he is enabled to get through a larger amount of general work, owing to the improvements developed in hand-tool manufacture. We are, however, making a move in this country of late, and the great advance made within the last few years in wood-working machinery for performing a variety of operations has, perhaps, tended to restrict progress in hand-tool making of the older workshop kinds.

Passing from the subject of woodworking machines and workmen's bench-tools, we come to the production of some woodwork exhibits in the Health Exhibition produced by their application. Those in respect to doors and windows, and their fastenings are not confined to any particular group or class in the Exhibition, but are scattered over the building here and there, some of them being found in connexion with the dwelling and the workshop, and some more apart. We have noticed one or two of them incidentally already; but the results may be summed up of these inventions and improvements without particularising names and stands. The necessity of providing appliances for insuring safety to life and limb in the opening, cleaning, and removal of sashes, and also in respect to the hanging of sashes, and for affixing of forms of fastenings whereby the dwelling may be secured from without, or from injury resulting from negligent action within, has led to the invention and introduction of a large number of expedients from the beginning of the century to the present. The misfortune is, that in door and sash making not only in those dwellings of the ordinary kind, but even in what are called superior middle-class houses, the joinery work provided, particularly since the first quarter of the present century, has gradually become poorer and thinner in scantling, and the framing, as a consequence, less strong and enduring. A good sash-fastener or other appliance in connexion with a flimsy window-frame and pair of sashes is just as much out of place as good locks and hinges with doors of the same miserable materials and workmanship in regard to house doors. On the score of skilled labour and good materials, some of the sash appliances in the present Health Exhibition are creditable enough, but instead of being simple in their adjustment they are rather complex, and entail from two to three and more operations. A system of pushing back and forward of knobs, with other interlocking arrangements entailing the use of keys, is a system which can never be adopted in ordinary houses. Except in houses of the better class, occupied by families who can afford to keep a number of servants, and where a certain discipline in house work is exacted, domestics cannot be got to do, or continue to do, the necessary operations which most of our lately-introduced appliances entail. In ordinary dwellings the majority of

these improved sash appliances would be broken or out of gear in a few days from rough treatment, even if otherwise their expense did not preclude their use in any but first-class dwellings. In the Carpenters' Hall exhibition we pointed out the obvious defects of an expedient in relation to taking sashes out of their frames with their cords attached without removing the parting-beads and inside stops. The ingenuity of the inventor in that case only produced weakness in the construction of the sash-frame, which would be more and more developed by wear and tear, leading eventually to an unsatisfactory state of matters. In the Health Exhibition we have what is termed "an improved window-frame and sashes," constructed to enable servants and others to clean the inside and the outside of the glass of both top and bottom lights, from the inside of the room when standing on the floor. Although there are no pivots here, there is a spring catch to be turned at the bottom, and next there is an application of a key to unlock the sash to enable it to slide. The sashes are hinged to pieces on each side, which may be termed in a manner false stiles, which slide along with the sashes in raising or lowering, and which allow the sashes at the same time to open inwards to be cleaned. This system, though ingenious, will not answer for general practice, for reasons already stated. French casement-sashes can be made to open inwards or outwards, but there is always a difficulty in making them weather or water tight without very exceptional provisions. Again, casement-sashes are not fitted for the British climate, although they will be found in many first-class houses in this country. We examined another window-frame with sashes fitted with "improved" appliances, by the use of which it is claimed that it is possible to dispense with outside work in cleaning the lights, both sashes being so fitted that by certain arrangements they can be turned inward. Here, too, simplicity is absent, though good workmanship and materials may be present. There are other window appliances, but to describe them would be to little useful purpose; for, although under special circumstances and care in well-regulated households, they might be found to answer; they never could be adapted to general use in dwellings. Of sash-fasteners alone, used merely for the purpose of tightly holding the meeting-rails of both lights together, and thus securing both when shut from shaking or from being opened from the outside, there have been some scores of patterns introduced, and the majority with indifferent success. None of the exhibits in any of the galleries of the Health Exhibition satisfactorily solve the difficulty, for the best of them err greatly on the score of complex arrangement in device as well as cost. The old barrel sash-fastener of our grandfathers' time, with its screw and spring, was one of the best of the old kind, and under certain modifications it is being again introduced. The defect of the old barrel sash-fastener was incidental to its wear and tear, and was also partly owing to the accumulation of coats of paint on the top-rail of upper sash and sill of lower sash, which prevented the meeting-rails of both sashes on their top surface from coming level together. After all is said that can be well said in regard to the hinging of sashes, the ordinary pulley system with good sash cords and weights behind the pulley stiles remains the most useful and applicable still, with all its obvious drawbacks.

In the East Central Gallery, in which some of the above window and sash appliances are exhibited, there is a door and frame complete, fitted with Stevens & Major's patent hydraulic door spring and check. This new and improved appliance is shown by Messrs. Smith & Stevens, Queen's-road, Battersea (Stand 903). There is no rebound in this case when the door is pushed open and allowed to swing back into position. The spring is so adjusted that it allows the door, when opened and then released, to move steadily back and remain still, without any rebound common to door-springs similarly placed. The Norton door check and spring, exhibited by Mr. R. Adams, and incidentally noticed previously, is a serviceable appliance in several positions. It prevents the slamming and banging of doors. Here the device consists of cylinder, piston spring, and self-adjusting valve. It is adapted to be affixed to the top part of a door and the frame over the door. There are two powers or forces embodied, the spring which closes the door and the check which, on the cushioning of the piston on air, brings the door to a stop near

the jamb, then immediately and quietly closing it by the operation of the spring regulated by the automatic valve. This "Norton" door-spring is at present in use in a number of our public buildings in the City and provinces.

In the East Gallery and East Central Gallery there are some furniture exhibits, home and foreign, possessing notable features. In the home furniture, manufactured in the furniture centres of London, there is great improvement evidenced of late years in design, many of the articles being quite as artistic as the foreign exhibits, and more substantial in material and framing. We allude, of course, to the outcome of our best and old-established houses, for we are thoroughly aware that a wretched class of furniture is still turned out to meet a certain market which exists for such cheap and nasty goods. The Austrian bent wood furniture (Stand 917), shown by Jacob and Josef Kohn, has its admirers in this country, and on the score of efficient bending and finish it deserves commendation. We think there is an opening in this country for a similar industry, with indigenous woods, several of which possess great strength and elasticity. The application of hot water or steam is necessary, with other requisites, though we have two or three native woods which are capable of being bent into almost any shape without steaming or the application of heat. We have also a number of woods in the British islands capable of being utilised for parquet floors, possessing strength and variety of colour. Work with these woods could be turned out quite as good as the specimens in the Health Exhibition into which mahogany and other foreign woods enter. True we have no native mahogany, but we have dark and light oak of extreme hardness, walnut, hornbeam, sycamore, maple, holly, pear-tree, beech, laburnum, thorn, hazel, cherry, wych-elm, yew, bog oak (in Ireland), and other variously coloured woods, some taking a beautiful polish.

In conclusion, we may add that we are not at all disposed to raise the question of "Machinery v. Hand Labour" in any antagonistic spirit. Capital and labour should work in harmony, for all capital is the produce of labour; yea, labour is capital, and a day is perhaps coming when skilled workmen will find that through co-operation their most honest and best desires may be obtained to the injury of no really legitimate interest. We desire at the same time to see hand labour dignified and sustained by a class of practically-educated operatives. We are not admirers of manufactured or machine art, and if the outcome of the Health Exhibition and our technical schools tends to the production of higher excellence in handicraft, or the work of the hand, lasting benefit will be secured to the industrial arts of this country.

HEALTH EXHIBITION LECTURES.

CANDLES.

On the 20th inst. a lecture was delivered by Mr. Leopold Field, in the lecture-room of the International Health Exhibition, on "Candles."

Sir Frederick Abel presided, and in introducing the lecturer observed that one of the lessons that had been learned from the International Health Exhibition was not to assume too hastily that any subject was not intimately connected with the public health. More especially with regard to candles he could speak as to the injury which had been sustained by students working by night by the light of candles of indifferent manufacture. It was a very great improvement, both as regarded health and safety, when candles were introduced which did not require snuffing.

The lecturer, after some general remarks, observed that doubtless some persons on finding "candles" unblushingly presented as promoters of hygiene would be disposed to ask what on earth candles had to do with public health. The candle had, however, kept pace step by step with the progress of civilisation, and every new departure in manufacture had been attended with a distinct improvement in the candle, and a better application of its great uses for the benefit of mankind. In primeval conditions there was not the same need for candles as now. Our forefathers retired to rest as the evening came on, and this was the case, to a more limited extent, now in agricultural districts; but here, where we were accustomed to the day being turned into night by the sudden clouding of the atmosphere, it was necessary that the

appliances which once administered to a very different state of society should be of the most perfect kind. The earliest news that came to us on the subject of candles was with regard to the old slips which were taken from the pine and dipped in resin. Then came the link, which gave a brilliant light, and the smoke was not, comparatively, so very great. But the link was not handsome, and gradually tallow and wax candles came into use. Wax was, of course, used by those who could afford it, the poor confining themselves to tallow. The rush-light they were familiar with, and it was still used by some people for the sick chamber. Associated with the ordinary tallow candle were the snuffers. It was not till the nineteenth century was far advanced that science might be said to have taken the candle in hand. The sperm fishery commenced, and spermaceti was yielded by the sperm whale, and from it was made the purest and most desirable candle, but it cost double as much as the ordinary candle. Chevreul, about 1811, brought his intelligence and knowledge to bear on the subject, and effected some important discoveries. He would explain what was absolutely essential in a candle. There were two things to be considered in constructing it. In the first place they had to make a wick with the exact amount of melting matter all the way through, and in the second place they had to contrive that the flame should be big enough to burn that melted matter and not be drowned by it. These were points which the candle-manufacturers set themselves to discover, and he thought they had succeeded as well as it was possible with the varying materials before them. There was nothing so difficult to bring to perfection as the candle. From every part of the earth or ocean where there was animal or fish they derived some constituent of the candle. And when they had got the required coating there remained the wick, and here was the great difficulty, for the wick was by no means so simple a thing as it no doubt appeared to many people. The lecturer then went on to mention that many descriptions of wax were used in making candles, but the wax of the bee recommended itself to everybody. The process carried out now was the same as when wax candles began to be made in any large quantity. No great advances had been made in that respect. It still remained a fact that wax candles could only be made out of wax which had been bleached by exposure to sun and air. Various kinds of wax came from all parts of the world, of different colour, appearance, and smell, and all were made use of in making the candle. Great care was necessary in selecting wax for bleaching. After it was bleached it was placed in store-houses; and it went through various stages during the three days that elapsed before it was in a condition for working. Mr. Field exhibited a splendid wax candle, 28lb. in weight, and the value of which was 15 guineas. The same process was, he said, gone through in making it as in producing candles 400lb. to 1lb. and four for a farthing in price. Owing to the nature of the substance it was impossible to make them by machinery; they had to be dipped and trimmed again and again until the required size was obtained. After giving a practical illustration by experiment as to the way in which a nice wax candle could be produced, he went on to refer to mould candles, which came into use about the middle of the seventeenth century, and might be taken as an advance in enlightenment. He observed that it was remarkable how long it took for the machine-made candle to get into popular favour, seeing how great were the advantages of the invention. The link and the spermaceti candles connected them with the past, but Chevreul made important discoveries which he had successfully brought to bear in the manufacture of candles. The lecturer having shown the nature of these improvements by experiments, passed on to the discovery of paraffin, which was produced from shale, and remarked upon the great reputation which had been made by Mr. Young in the manufacture of paraffin candles. Scotland was the great field for these candles, as it was there that shale was found in great quantities, and they held their own against the enormous influx of American goods. In conclusion, Mr. Field drew attention to numerous specimens of candles which were displayed on the tables on the platform, of all colours and sizes, which had been made from the products of shale. He showed how paraffin candles were manufactured,

producing some beautiful specimens, and remarked that Young had passed away but Chevreul still lived, and he hoped, would see the eve of his hundredth anniversary illuminated by the improved lights he had called forth as compared with that of the once nasty and disagreeable tallow.

THE HISTORY OF ENGLISH DRESS.

ON Tuesday afternoon the Hon. Lewis Wingfield delivered a lecture in the Conference Room on "The History of English Dress." Mr. George Augustus Sala presided, and in a few opening remarks said it was almost superfluous that he should introduce the lecturer, Mr. Lewis Wingfield, who was well known as an authority on costume, and moreover, he had arranged for public inspection, in the West Quadrant, one of the most popular features of the Exhibition, to which had been applied the epithet of "Wingfield's Waxworks."

Mr. Wingfield commenced his discourse by remarking that the dress of mankind had always consisted of a dress, short or long, tight or loose, according to the particular period when it was in use. For instance, the early Romans, who lived in a warm climate, adopted a loose mode of attire, which was the more comfortable, while the denizens of the North, accustomed to war and the pursuits of the chase, chose garments which fitted close to the skin. In the olden days colours were few and far between, and many of the garments worn were very similar to those in use at the present day. The diagrams which he exhibited on the wall conveyed a better idea than could be gained by any verbal description of costumes in vogue at different periods of history. Mr. Wingfield here exhibited a picture of Boadicea, her garments having been designed in accordance with the description given of her appearance by Strabo. The portrait was that of a handsome, tall, full-grown woman of somewhat stern countenance, with long hair flowing over her shoulders. She wore a couple of plates of steel. The next portrait was that of Hengist, who was by no means a prepossessing individual. He regretted to have to say that the heroic Hengist was carotid, that he was freckled, and that he was fat. The Anglo-Saxons clung to short skirts while their Norman lords went about in long robes. The Norman ladies put the Saxons to shame in the matter of attire: they wore their hair in long plaits behind, and with much gold and many gems mixed up with it. He now came to a subject which he must approach with bated breath—he meant the under garment called "stays." The first use of the corset spoken of was by the Countess of Leicester in 1265. Terence referred to ladies who saddled their backs and laced their waists to make them elegant. They had evidence, however, that gentlemen wore stays as well as ladies. Chaucer spoke of slender waists being genteel. Queen Eleanor devised a corset of steel, a model of which the lecturer exhibited, it bearing much more the appearance of a piece of armour than an article of dress. Whalebone stays came into use in the time of Elizabeth. James I. insisted on all his courtiers cultivating a wasp-like waist, but possibly the most harrowing corset ever brought into use was that of the time of George II., the front being made of wood. It was not easy to understand why, after the discovery of whalebone, they should have used timber. The warriors of Gustavus Adolphus wore stays. The "Fiend of Fashion,"—a reproduction of an old caricature,—showed the corset of the period in all its beauty. The eccentricity of costume reached its climax in the time of Richard II., and many attempts were made by way of legislation to put a stop to extravagance in this matter. The writers of the day, too, were never tired of inveighing against the foppery of fashion; but for several reigns there was little improvement recognisable. It was curious to note, with regard to this period, that the long robe came into general use, and it was almost impossible to distinguish a lady from a gentleman. The beginning of the sixteenth century brought with it a complete alteration of fashion; men gave up flowing robes, and boots were worn the shape of which had some regard to comfort. Although the square-toed boots were not handsome, they were better than the peaked toes 2 ft. long formerly in use. Women about this time adopted a head-dress similar in all material respects to the modern bonnet. This was the period of the

Renaissance, a time of luxury, and costume was very expensive. Henry VIII. made very strict sumptuary laws, although he and his Chancellor, Wolsey, delighted in all kinds of finery and display, and in this legislation he showed his characteristic selfishness. James I. invented a new hat, which developed later into a Cavalier hat, and afterwards became diminished into the modern wide-awake. The flat brim and tapering crown of this hat constituted quite a new departure, and the origin of this was traced to Spain, whence it was introduced into France by the League, and known as the "Chapeau Henri Quatre." The lecturer at some length referred to the use of wigs, powder, patches, &c., illustrating his remarks by quotations from Gay, Cibber, and other writers of the period. The hoop dated from the time of Queen Elizabeth, and was always very inconvenient. It was then known as the farthingale. The fashion was caricatured by Hogarth. Absurdity reached its acme when "macaronia" came into existence. The use of "false hair" obtained a fair share of the lecturer's attention. He gave a humorous account of a reception given by Prince Frederick and his newly-made bride sitting up in bed, and also of the opening of a lady's head in the days of exaggerated perukes.

The Chairman, in moving a vote of thanks to the lecturer, observed that he was sure he was only expressing the feeling of the entire audience when he said they had listened to Mr. Wingfield's address with equal interest and amusement. He had not only delighted but he had instructed them. He felt satisfaction in the reflection that there was an absence of tyranny in the selection of modern costumes, and he protested that men were every bit as good milliners as women, but they had never yet been able to manufacture a bonnet. In that matter they had shown their utter incompetency and incapability. He concluded by stating emphatically that he preferred modern to ancient costumes because it fairly obeyed hygienic principles, to the lessening of such diseases as consumption, which was much more prevalent forty or fifty years ago than now.

Mr. Edward Levy Lawson briefly seconded the resolution, which was very cordially received. Capt. F. S. Dumaresq de Carteret Bisson proposed a vote of thanks to the chairman, which was seconded by Mr. J. L. Toole, who remarked upon the enthusiasm of the female portion of the audience who had brightened up the lecture with their interpolated applause, and had approached to the very feet of the lecturer with ear-trumpets to catch every word that fell from his inspired lips.

HEALTHY BUILDING AND LEGISLATION.

IN connexion with the Exhibition the Social Science Association has been holding two afternoon conferences on subjects relating to health. The following is a portion of a paper read on Thursday by Mr. H. H. Collins, under the title, "What Conditions are essential for a Healthy Dwelling, whether in an Urban or in a Rural Locality; and how far is it desirable that they should be rendered compulsory by Legislation?"

The question divides itself into two heads, the first of which alone opens out and embraces the whole field of hygienic science; yet, great as it is, it might be answered in one small word,—cleanliness; for this is the essential of all sanitary work, and is its synonym. What does this mean? The conservation of God's common gifts to man in the same condition as they were rendered to him,—unsullied air, pure light, unpolluted water, uncontaminated soil, and sanitary surroundings. These conditions can, however, only be obtained by strict attention and adherence to nature's teachings. They are each and all interwoven and interdependent. Neglect of one inevitably produces injury to the other.

The evil attendant upon unclean "ground-air" has been proved to demonstration by Pettenkofer. This air, he proves to us, in its ceaseless motion, is ever absorbing itself into the underground water, penetrating into the substances forming the soil, sinking or rising by difference of temperature, or influenced by barometric pressure; sometimes causing putrefaction, and at other times acting antiseptically, always ready to intrude and commingle with the air of the house, bringing with it those microscopic and morbid germs, ever ready to germinate in suitable soil.

Now, it is well known that the quality of air

is ordinarily tested by the amount of carbonic acid gas which it contains. Pettenkofer's investigations go to show that "ground-air" invariably contains 50 per cent. of this gas more than "ground water," so he adds, it is clear that it is the air which impregnates the water, and not, as is generally supposed, the reverse; and he draws the natural inference, that the source of this gas is to be found in the soil; that it parts with it simultaneously to both air and water, but with far greater facility to the air than to the water. I have dwelt rather long on this subject, because a healthy foundation is the fundamental essential of a healthy dwelling.

What are the lessons to be derived from these facts? That, irrespective of all statistical or constructive considerations, we must, before all things, drain the subsoil of our houses and their surroundings, and confine all impure emanations by sealing the sites with impervious coverings of concrete or asphalt, — that the formation of our roads, and the surroundings of our dwellings, must be similarly treated, — that no soil must be considered as "virgin," but all must be carefully examined, and every precaution taken to ensure this first essential, a healthy foundation upon which to erect a healthy house. Poison the soil, and you poison the atmosphere.

Our next care must be not to foul the air by bad drainage. All connexions between the main sewer and the house must be studiously avoided, since gases pass, sooner or later, with the greatest ease through all water-traps, and evaporate into the air of the house, and so pollute it; we must periodically examine and cleanse our drainage system, and so lay the pipes as to admit of this being done with ease and economy. Remembering that the air, like water, travels and flows, we must, by the interposition of areas, or by cementing or asphaltting the walls where the earth abuts against them, shut out and prevent all air currents flowing to the interior of our houses.

The aspect and location of rooms must be sanitariously adapted each to its several uses, so that every apartment may freely partake of surrounding pure air, and each have its due proportion of sunlight (when this can be obtained); for it must not be forgotten that in this climate it has been calculated that we only obtain 189 days of sunlight, and that last year, according to the Astronomer Royal, we only enjoyed fifty-one days seventeen hours.

To insure pure light, important as, and coincident with, pure air, care must be taken that our houses are built with sufficient space surrounding them, to such a height that they will not overshadow each other, and so planned that only a certain number shall be permitted to be erected per acre. Rest assured that a dark house must engender an insanitary condition, irrespective of its depressing and lowering tendencies. A house bathed in air possesses in itself an antidote to many of the evils I have sketched. But given a well-selected and protected site, with good drainage, clear sunlight, and well-planned accommodation, one precaution must be insisted on if we would maintain the sanitary state of things we have taken so much trouble and expended so much thought to obtain. We must not "overcrowd." The cubical contents of the rooms must be proportioned to their inmates. Overcrowd the most sanitariously-arranged domicile, and ultimately it becomes totally unfit for habitation. Not only do we destroy the purity of its atmosphere, but we generate deleterious organisms, which live and thrive in the very interstices of the materials of which the house is composed, and once created and vivified, it is seldom that we are able to destroy them. Never should the axiom formulated by that eminent sanitarian, Dr. Farr, be forgotten, that just in proportion to density, or proximity of population, is its mortality.

Water, the next essential, — the absolute necessity of life, — the medium of all others most easily fouled, — the most fertile cause of insanitary conditions, — how shall we preserve it pure and undefiled? By strict attention to the state of the air. We have only to peruse that most charming volume "The Floating Matter in the Air," from the pen of Tyndall, to convince ourselves of the necessity of adopting the greatest precaution in this respect. I venture to assert that, beyond a doubt, a single virus of disease may impregnate a source of water and give life to myriads of bacteria and other low forms of organisms, perhaps the origin, certainly the producer, of

disease. Do we want confirmation, we have only to make ourselves acquainted with the admirable researches, and their beneficent results, of Lister, Koch, and Pasteur, as evidenced by the stamping out of the anthrax of the cattle, the pébrine of the silkworm, the chicken cholera of the fowl.

Yet let us bear in mind that Tyndall proves to us that these beginnings of life "are only noxious when out of their proper place." Our plumbing, therefore, should be most carefully contrived, with pipes of good and perfect manufacture, tested to a strength sufficient to withstand any outside influences; joints carefully made; wastes and overflows disconnected from drains; improper types of water-closet apparatuses discarded, with traps cautiously applied, and, when used, of proper construction; with soil-pipes open at top and bottom, and freely ventilated, positioned away from all ingress to the house, with rain-water-pipes similarly treated. Baths, lavatories, and sinks, not only of best character, but likewise sanitariously located. With cisterns so positioned as to be facile of access, and of such material as to admit of easy cleaning; with drinking-water so jealously guarded that by no possibility can it have any connexion with that used for ordinary cleansing or ablution purposes. With filtration so contrived that the filtering medium can be periodically and readily renewed; with ample supply (sufficient enough to waste if you will) profusely used for flushing and cleansing purposes, and when once soiled instantaneously removed from the house and its precincts.

Lastly, it should be a canon of water supply that ought but pure and undefiled water should ever be allowed to remain within the healthy house, and this points to the necessity of a constant supply. All the sanitary provisions which I have thus hastily generalised will be rendered comparatively nugatory if the surroundings of the house be contaminated; for doors, windows, ventilation, and even walls, whether of brick or stone, will admit impurity. One of the greatest offenders is the dust-bin; it is, and has been, more productive of disease than it is credited with. No vegetable or organic matter should ever soil its interior, such should be invariably burned; it should be manufactured of light galvanised iron, constructed with a lid so as to prevent the insertion of improper materials and to obviate the scattering of its contents. A new dust-bin per annum would not be an extravagance.

In the grounds of the Exhibition will presently be exhibited, side by side, sections of a sanitary and of an insanitary house. The subcommittee who have planned the same (of which I have had the honour and pleasure of being a member) have sought therein to show some and some only of the conditions which constitute a healthy and unhealthy house. They have laboured, however, under the same difficulty which I have experienced in preparing this paper, viz., the dealing with a very large subject with inadequate time, means, and space at their disposal; and when you shall criticise the confessedly imperfect details of their labour, I ask you to judge of them with kindly consideration, bearing in mind that a mere educational sketch is presented, although it is an honest endeavour to bring home to the minds of the uninstructed multitude the evils which exist and the ease and economy with which they can be avoided and rectified.

There is one subject which, however, I should wish to bring before this Conference, viz., the enormous height to which houses are now being erected, caused by the extreme value of land, or other economical exigencies, — but, nevertheless, effecting insanitary conditions of a grave character, shutting out light and air, and sinking the occupants of the lower stories into wells of stagnant atmosphere. Let me direct your attention to a model of an Artisan's Building (shown in this Exhibition) of this description, about to be erected in the Minories by the Metropolitan Railway Company, about ten stories high, with enclosed areas or inner courts, and surrounded by other properties. Should such a work as this be permitted? We have the testimony of Dr. Beddoe "that lofty staircases tell unfavourably on the health of those frequently ascending them, producing anæmia and functional affections of the heart," — and who can doubt it? Surely, buildings of this class are not the outcome of philanthropy, but of crass sanitary ignorance.

Sensible that I have omitted much which should have been stated in this paper, had time

permitted, I beg to submit that all the essentials which I have enumerated are as necessary for the sanitary well-being of a rural as of an urban dwelling, and that all the precautionary measures suggested are as capable of being applied to the one as to the other, — of course under different conditions, — for example, probably irrigation would take the place of drainage proper, earth or pail closets of water closets, and so forth.

In the Sanitary and Public Health Acts of the United Kingdom will be found ample provisions for ensuring the hygienic precautions necessary to the perfection of healthy habitations. The difficulty is to obtain an energetic administration of the law as it exists.

Amongst those amendments which I venture to think essentially necessary are, *uniformity* both in action and area; abolition of distinctions between *urban* and *rural* districts; the application of the Sanitary Acts to the whole kingdom; the recession of exemptions; and independent and clearly-defined status for our medical officers of health with adequate remuneration; properly educated and certified inspectors; and above all, a moving, controlling, and initiative power embodied in a minister of health, endowed with responsible authority, and assisted by the best scientific, medical, architectural, and engineering ability; such an authority as this would lend dignity to the office, and would stimulate the local authorities throughout the length and breadth of the land. This has been advocated and urged by our Association for many years; it would be more efficacious than drastic remedies and sanitary police.

There are three moods through which local authorities generally pass, but they are not in grammatical succession; the first, unfortunately, is the *potential*, the second the *infinitive*, but the third is the one which I am in favour of, the *imperative*, and this, therefore, is the answer which I render to the last portion of the question, — Legislation to be effective should be *compulsory*.

With this we bring to a close our series of special Health Exhibition Supplements, but we shall have more to say about the Exhibition from time to time during the next few weeks.

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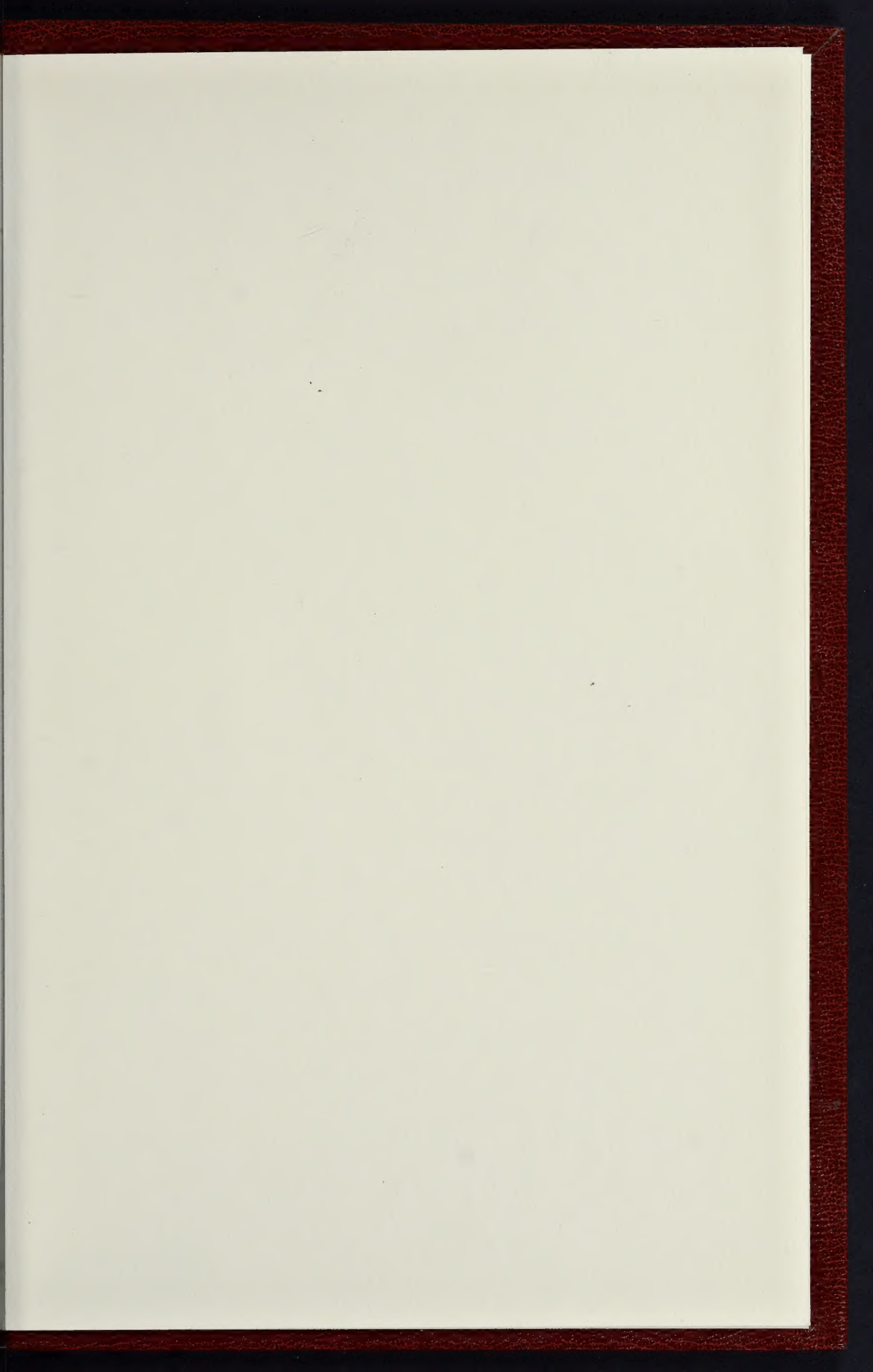
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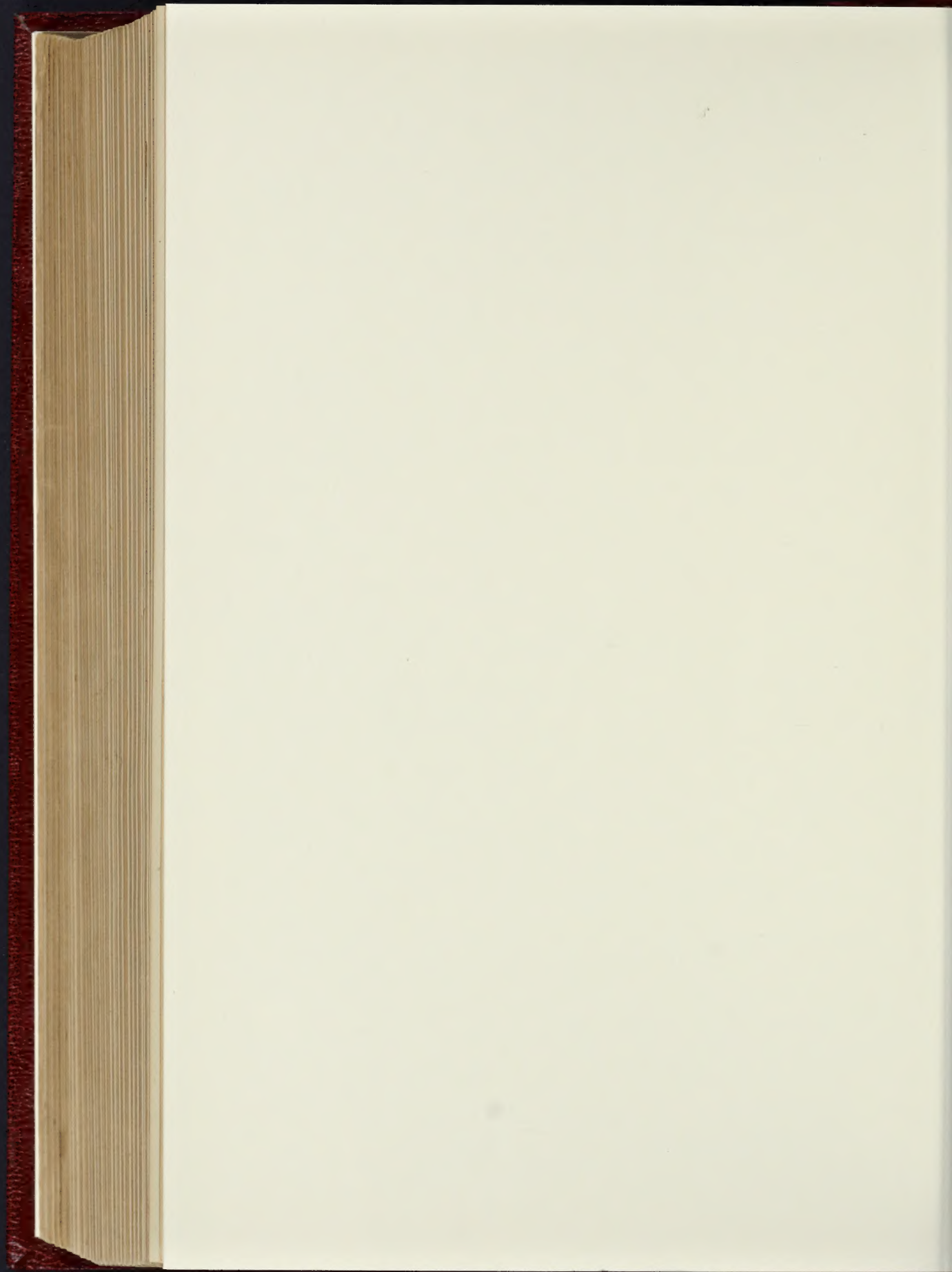
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